CalcStar

User's Manual

CS-3510-1 (1.2)

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ADDENDUM TO CALCSTAR RELEASE 1.2

A Demonstration

of CalcStar's Capabilities

There are two sample files supplied on your CalcStar disk. These two files, DEMO.CSD and HELPER.CSD, provide an overview of CalcStar's capabilities. DEMO consists of tables and formulas for a depreciation table. HELPER allows you to work with a seasonal business' income statement that contains data for six consecutive summers. Together they will explain the Auto, Merge, and Recalculate commands, and display the conditional logic and financial forcasting functions. They will also demonstrate CalcStar's interfacing capability with BASIC, WordStar™, SuperSort™, and other MicroPro programs. After using CalcStar with these sample files you will have a good idea about using it for your own applications.

Before continuing with this introduction, be sure that CalcStar has been configured for your system through the install process (Appendix D in the user's manual) and that a backup copy of the original disk has been made.

DEMO

Given the initial dollar value of an asset, the corresponding depreciation rate, the year the asset was acquired, and the expected residual value, DEMO will list information for each year following the year the asset was acquired. The listed information gives the year, the depreciation expense, the accumulated expense, and the book value (until the book value is less than or equal to the residual value).

First, you must put CalcStar into operation. At the CP/M prompt, type 'CS'<RETURN> (<RETURN> means press the return key). The screen will clear, and then the standard screen will appear, as shown below:

```
********************************************************************************
* -Cursor Movement- |          -Commands-  ; followed by              | -Misc-    *
*  <CR> Right       |A Auto    F Format  M Merge  R Recalc * Extend |@ Curs Pos *
* ^S Left  ^D Right |C Copy    H Help    O Order  S Save   = Lock   |? Evaluate *
* ^E Up    ^X Down  |D Delete  I Insert  P Print  W What   ? Space  |^ Data Togl*
* ^Z Col A next row |E Edge    L Load    Q Quit   G or <TAB> Goto   |<ESC>Cancel*
*Col>|A         |B          |C          |D          |E          |F          |    *
*Row+--------------------------------------------------------------------------*
*  1|>        <                                                                *
*  2|                                                                          *
*  3|                                                                          *
*  4|                                                                          *
*  5|                                                                          *
*  6|                                                                          *
*  7|                                                                          *
*  8|                                                                          *
*  9|                                                                          *
* 1Ø|                                                                          *
*   +--------------------------------------------------------------------------*
*             cursor:   A1      current:   A1     L-R                          *
*                                                                              *
*current||     type:                                                           *
*data   ||  contents:                                                          *
*              edit:_                                                          *
* CalcStar (c) 1981 c/o MicroPro Int'l CS9999XX rv_nnn [terminal type]         *
********************************************************************************
```

When the screen cursor rests (or blinks) on the edit line, type ';L'. The semicolon means "Command". The "L" command tells CalcStar to **load** a file. A filename is now requested. Respond with DEMO<RETURN>. A load position is requested with a default value presented. The default value is cell "A1". A cell is an area on the screen which can hold data and is marked by the intersection of a column and a row. In this case the column is "A" and the row is "1". Since most files are loaded at cell "A1", respond to the query with the default value by pressing <RETURN>. Once you press <RETURN> a series of dots will appear at the bottom left of the screen display. These dots tell you that a file is loading. The display now appears as follows:

```
*******************************************************************************
* -Cursor Movement- |        -Commands-  ; followed by             | -Misc-    *
*  <CR> Right       |A Auto   F Format  M Merge  R Recalc * Extend |@ Curs Pos *
* ^S Left  ^D Right |C Copy   H Help    O Order  S Save   = Lock   |? Evaluate *
* ^E Up    ^X Down  |D Delete I Insert  P Print  W What   ? Space  |^ Data Togl*
* ^Z Col A next row |E Edge   L Load    Q Quit   G or <TAB> Goto   |<ESC>Cancel*
*Col>|A                       |B         |C         |D         |E          |    *
*Row+------------------------------------------------------------------------*
*  1|>Item....................<                                               *
*  2| Initial Value ($).......         Ø                                     *
*  3| Depreciation Rate (%)...         Ø                                     *
*  4| Year Acquired...........         Ø                                     *
*  5| Residual Value ($)......         Ø                                     *
*  6|------------------------ ---------- ---------- ---------- ----------     *
*  7|                              Year  Dep. Exp.  Acc. Dep.  Book Val.      *
*  8|                         ========== ========== ========== ==========     *
*  9|                                                                         *
* 1Ø|                          no entry                                       *
*   +------------------------------------------------------------------------*
*              cursor:   A1      current:    A1     L-R                      *
*                                                                             *
*current||       type: text: left justified                                   *
*data   ||   contents: 'Item....................'                             *
*                edit:_                                                       *
* CalcStar (c) 1981 c/o MicroPro Int'l CS9999XX rv_nnn [terminal type]       *
*******************************************************************************
```

Now that this table has been set up, it is easy to calculate depreciation values. For this demonstration we have preset those cells which require data to be entered. Type ';A' to place CalcStar in the **Automatic Forms Mode.** While in the Automatic Forms mode, the operator is allowed to enter data in predesignated cells only. After each entry, the cursor automatically advances to the next cell. After data is entered into the last cell, CalcStar automatically performs calculations using the entered data and then places the results in other designated cells. The cursor is defined on the left by the ">" symbol and on the right by the "<" symbol and marks the active cell. To demonstrate the simplicity of entering data, enter the following (remember, end each entry by pressing <RETURN>): truck; 12ØØØ; 25; 1981; 15ØØ. After the last entry, CalcStar begins calculations. The following display is the result:

```
********************************************************************************
* -Cursor Movement- |         -Commands-  ; followed by             | -Misc-   *
*  <CR> Right       |A Auto   F Format  M Merge  R Recalc * Extend  |@ Curs Pos *
* ^S Left   ^D Right |C Copy   H Help    O Order  S Save   = Lock    |? Evaluate *
* ^E Up     ^X Down  |D Delete I Insert  P Print  W What   ? Space   |^ Data Togl*
* ^Z Col A next row |E Edge   L Load    Q Quit   G or <TAB> Goto    |<ESC>Cancel*
*Col>|A                       |B         |C          |D          |E          |    *
*Row+--------------------------------------------------------------------------*
*  1| Item.................... truck                                          *
*  2| Initial Value ($).......     12ØØØ                                     *
*  3| Depreciation Rate (%)...        25                                     *
*  4| Year Acquired...........      1981                                     *
*  5| Residual Value ($)......>     15ØØ<                                    *
*  6|------------------------ ---------- ---------- ---------- ----------    *
*  7|                               Year  Dep. Exp.  Acc. Dep.  Book Val.    *
*  8|                         ========== ========== ========== ==========    *
*  9|                                                               12ØØØ    *
* 1Ø|                               1982       3ØØØ       3ØØØ       9ØØØ    *
*   +--------------------------------------------------------------------------*
*              cursor:    B5       current:    B5     L-R                     *
*                                                                              *
*current||       type: numeric                                                *
*data    ||   contents: 15ØØ                                                   *
*                edit:_                                                        *
* GalcStar (c) 1981 c/o MicroPro Int'l CS9999XX rv_nnn [terminal type]        *
********************************************************************************
```

If you want a larger display of the depreciation table, you can turn off the **Help Menu** with the **Extend** command. To invoke the Extend command, type ';*'. The display will immediately expand from a ten to a fifteen row display. To return to a ten row display, repeat the command.

One way in which CalcStar can be very helpful is by allowing you to examine alternatives. For example, suppose that you wished to see what difference a change in the rate of depreciation would make in the anticipated useful life of the asset. To change the depreciation rate, you must move the cell cursor to the cell containing the original value. You can **move the cursor** by holding down the control key while pressing one of the other keys. ^E (the simultaneous pressing of the Control key and the "E" key) will move the cursor up one row. ^X will move the cursor down one row. ^S and ^D will move the cursor left and right one column, respectively. Move the cell cursor to B3 (Depreciation Rate (%)). Once the correct cell is reached type '3Ø'<RETURN>. The contents of the cell changes immediately to the new value.

Now that the depreciation rate is changed, you want to adjust the rest of the figures that depend on the depreciation rate. Use the **Recalculate command** to do this. In order to better see the effect of the Recalculate commmand, turn off the Help Menu with the Extend command ';*'. Then, type ';R' to begin the recalculation. CalcStar will ask whether all the entries or only the current entry should be recalculated. Enter 'A' for all. Row numbers at the lower left of the screen display will increment in periodic flashes and then the recalculated figures will appear. The display should resemble the following:

```
********************************************************************************
*Col>|A                        |B         |C         |D         |E          |   *
*Row+---------------------------------------------------------------------------*
*  1| Item.................. truck                                             *
*  2| Initial Value ($).......      12000                                      *
*  3| Depreciation Rate (%)...>        30<                                     *
*  4| Year Acquired...........       1981                                      *
*  5| Residual Value ($)......       1500                                      *
*  6|------------------------ ---------- ---------- ---------- ----------      *
*  7|                               Year  Dep. Exp.  Acc. Dep.  Book Val.      *
*  8|                         ========== ========== ========== ==========      *
*  9|                                                               12000      *
* 10|                               1982       3600       3600       8400      *
* 11|                               1983       2520       6120       5880      *
* 12|                               1984       1764       7884       4116      *
* 13|                               1985       1234       9118       2881      *
* 14|                               1986        864       9983       2016      *
* 15|                               1987        605      10588       1411      *
*   +---------------------------------------------------------------------------*
*            cursor:    B3       current:    B3      L-R                        *
*                                                                               *
*current||       type: numeric                                                  *
*data   ||   contents: 1500                                                     *
*                edit:_                                                         *
********************************************************************************
```

A more direct method of moving the cursor to the intended cell is to use the **Goto** command. For example, to make changes in cell "B5", instead of using the cursor motion keys (^E, ^X, ^D, ^S), use the Goto command. To invoke the Goto command, press '<TAB>'. In the lower left of the screen the prompt, "GOTO > A1" appears. Pressing <RETURN> will move the cursor to the default cell, "A1". However, since "B5" is the intended destination, type 'B5'<RETURN>. The cursor now appears in cell "B5".

If you want a printout of the screen display, invoke the **Print** command by typing ';P'. CalcStar will request the output file, defaulting to the printer. Press <RETURN> for the default value. The upper left cell of the printout is requested, defaulting to "A1". Press <RETURN> for the default value. The lower right corner of the printout is requested, defaulting to the extreme lower right of the worksheet. Type 'E15'<RETURN> to include only significant rows and columns of the worksheet. The form length is requested, defaulting to continuous. Press <RETURN>. The form width is requested, defaulting to 132. Type '80'<RETURN> if 80 column paper is in the printer, otherwise press <RETURN>. You are then allowed to enter titles for the printout. Type, 'Depreciation Table'<RETURN>. Each title line is centered on the first page of the printout (if there is more than one page). Press <RETURN> again and the printout of the table will begin. The first title line that contains no more than a <RETURN> will initiate the printing of the table.

The display contents can be saved at anytime with the **Save** command, ";S". You want to save the file before quitting and also every half hour or so to protect yourself from power fluctuation which might cause your program to cease functioning. Once invoked, a filename is requested, defaulting to the input filename, if there is one. You may use the default name by pressing

<RETURN>, or enter a new name such as NEWDEMO<RETURN>. If the default is used, you are asked if the old file contents should be destroyed or not. If you respond with 'N', then the save routine is stopped and control is returned with no damage done to the original or the updated file. If you respond with 'Y', then you are requested to respond as to whether a part of the worksheet or all of the worksheet should be saved. Type 'A' for all. You are then allowed the option to protect the file with a password. Or, if you want to bypass this option, press <RETURN>. In the lower left of the display, the row numbers will increment in periodic flashes. CalcStar will display, "SAVED", once the file has been saved.

The DEMO file was intended to show you what a reasonably complicated calculation might look like. You will need to study the user's manual and work out your own examples which may include formulas like those in the DEMO table at cells E12 and B1Ø. You set up the table in much the same way as you enter data. For example, move the cursor to cell "E12" by pressing <TAB> and 'E12'<RETURN>. The contents line at the bottom center of the screen display will contain the character sequence '+E11-B5<=Ø:"b̸":+E11-C12' ("b̸" symbolizes a blank). This character sequence is a conditional expression. In English, it means, "If the difference between the contents of cell B5 and contents of cell B11 is less than or equal to zero, then put a blank in cell E12, otherwise place in E12 the difference of the contents of cell C12 and contents of the cell E11". A simpler expression could have been used to produce an answer by omitting the conditional and only placing "+E11-C12" in cell E12. Further explanation about creating an application system can be found in the CalcStar user's manual.

HELPER

With HELPER.CSD, an operator is allowed to enter information in the form of an income statement for consecutive summers. Estimates of future figures for a variable may then be made. For example, given the sales for six consecutive summers HELPER can provide a sales estimate for a future summer.

From within the CalcStar program, load HELPER by following the procedure used for loading DEMO. The screen display will resemble the following:

```
********************************************************************************
* -Cursor Movement- |        -Commands-  ; followed by            | -Misc-     *
*  <CR> Right       |A Auto   F Format  M Merge  R Recalc * Extend |@ Curs Pos *
* ^S Left  ^D Right |C Copy   H Help    O Order  S Save   = Lock   |? Evaluate *
* ^E Up    ^X Down  |D Delete I Insert  P Print  W What   ? Space  |^ Data Togl*
* ^Z Col A next row |E Edge   L Load    Q Quit   G or <TAB> Goto   |<ESC>Cancel*
*Col>|A                          |B          |C          |D          |E         *
*Row+-------------------------------------------------------------------------*
*  1|>                           <Summer of  Summer of  Summer of  Summer of *
*  2|                                    78         79         80         81*
*  3|                            ---------- ---------- ---------- ----------*
*  4| Net sales                           Ø          Ø          Ø          Ø*
*  5| Cost of goods sold                  Ø          Ø          Ø          Ø*
*  6|                            ---------- ---------- ---------- ----------*
*  7|     Gross profit on sales           Ø          Ø          Ø          Ø*
*  8|                            ---------- ---------- ---------- ----------*
*  9| Operating expenses:                                                   *
* 1Ø|   Selling expenses                  Ø          Ø          Ø          Ø*
*   +-------------------------------------------------------------------------*
*             cursor:    A1       current:     A1     L-R                     *
*                                                                             *
*current||       type: (empty, but allocated)                                 *
*data   ||   contents:                                                        *
*                edit:_                                                       *
* CalcStar (c) 1981 c/o MicroPro Int'l CS9999XX rv_nnn [terminal type]        *
********************************************************************************
```

The display shows only a skeletal form of HELPER, in that no figures are entered on the worksheet. You may enter data into each cell by moving the cursor around.

There is also an alternative way to enter data into the cells. By using the **Merge** command, another file (such as a file containing data) can be loaded on top of the existing display. To use the Merge command type ';M'. CalcStar will request the filename. Respond with 'HELP1'<RETURN>. HELP1 is another file developed very much in the same way as HELPER except HELP1 supplements HELPER with figures for the rows and columns. A load position is requested with "A1" as the default. Enter 'B1'<RETURN>, because HELP1 was designed to load at cell B1. Again, a series of dots forms at the lower left to inform you that a file is loading. The result will appear as the following:

```
******************************************************************************
* -Cursor Movement- |        -Commands-  ; followed by          | -Misc-     *
*  <CR> Right       |A Auto   F Format  M Merge  R Recalc * Extend |@ Curs Pos *
* ^S Left  ^D Right |C Copy   H Help    O Order  S Save   = Lock   |? Evaluate *
* ^E Up    ^X Down  |D Delete I Insert  P Print  W What   ? Space  |^ Data Togl*
* ^Z Col A next row |E Edge   L Load    Q Quit   G or <TAB> Goto   |<ESC>Cancel*
*Col>|A                       |B          |C          |D          |E          *
*Row+------------------------------------------------------------------------*
*  1|                         >Summer of <Summer of  Summer of  Summer of *
*  2|                                 78          79          80         81*
*  3|                         ----------- ----------- ----------- -----------*
*  4| Net sales                     4000        4800        4848       5575*
*  5| Cost of goods sold            3000        3600        3636       4181*
*  6|                         ----------- ----------- ----------- -----------*
*  7|     Gross profit on sales     1000        1200        1212       1394*
*  8|                         ----------- ----------- ----------- -----------*
*  9| Operating expenses:                                                   *
* 10|   Selling expenses             400         480         485        558*
*   +------------------------------------------------------------------------*
*              cursor:    B1       current:    B1     L-R                    *
*                                                                            *
*current||       type: text: right justified                                 *
*data   ||   contents: 'Summer of'                                           *
*                edit:_                                                      *
******************************************************************************
```

Suppose you had to find the pre-tax income for the summer of 1981. If you guessed that this number was in cell E16, you could use the Goto command to move the cursor to cell E16. After sending the cursor to E16, the row and column headings disappear, because the display is not large enough. A quick method of determining the headings is to use the What command by typing ';W'. The column and row headings will appear at the bottom of the screen display. The year does not display because it is not in row one.

The **Extended What** or **Lock** command has been provided as an altenative to using ";W" to request the headings. First, go to cell A3 by pressing '<TAB>' and typing 'A3'<RETURN>. Type ';=' to invoke the Lock command. You are then asked whether rows, columns, or both should be locked. Respond with 'B' for both. A series of asterisks will appear alongside the locked columns and rows. Now move the cursor back to E16. Notice that the headings will not disappear. The Lock command toggles. Therefore, if you wish to turn off the heading lock, type ';=' and 'B'.

If you want to process or create large worksheets, the amount of room available for entries should be known. Display the approximate number of **available entries** by typing ';?'.

The example income statement was designed specifically for making estimates. By examining the figures for consecutive summers, one might be able to guess the expected sales figure for the summer of 1985. There exists, however, a more scientific and established method called **linear regression** for estimating or **forecasting.** CalcStar is equipped with such a function. By moving the cursor to cell B20, a forecasting function will appear. The contents line will display

    '+regr(B2>G2,B4):"........'.

This character sequence establishes a regression constant that is necessary for all linear regression functions. The regression constant for the most part is not important and therefore is replaced by a series of dots in the screen display. Moving the cursor one block to the right will display the character sequence used to calculate the projected sales for the summer of 1985. The projection figure immediately below is done similarly, except that it displays a projection with respect to a hypothetical advertising expense instead of a projection with respect to time. The next figure below is called a dependency. In effect, the figure explains that a sales of $15,ØØØ depends on an investment of $1,127 in advertising. The CalcStar user's manual provides further information on linear regression functions.

You now have some ideas about how CalcStar can be tailored to your needs. You can also combine two other capabilities with CalcStar: interfacing CalcStar files with WordStar and creating compatible files for CalcStar, DataStar, MailMerge, SuperSort, and BASIC.

You can use WordStar to enhance a depreciation report such as the one in DEMO. Follow the procedure below to prepare the file for use by WordStar. This procedure assumes the subject file is loaded.

1. Invoke the print command with ';P'.
2. Instead of defaulting to the printer, divert the output to a disk file by typing 'DEMO.TXT' (the suffix TXT will be assigned automatically).
3. The beginning and ending cells of the report are optional.
4. The print width is optional.
5. Titles are optional.

The file DEMO.TXT will then be a WordStar compatable file that can be manipulated in any way WordStar allows.

The ability to create BASIC, DataStar^{TM}, and MailMerge^{TM} files extends CalcStar beyond the scope of personal use. Data in Calcstar that is usually limited for viewing by the number of people one could crowd around a terminal can be distributed in form letters with the use of MailMerge. BASIC programs can provide further manipulation of data. DataStar can store CalcStar's data. To create a file with comma delimited fields that can be used by these programs, follow the above procedure for creating a TXT file but prefix the filename with "greater than" sign (">").

We hope that this introduction gives you some ideas about how to use CalcStar as a new and exciting tool. Use the reference manual when you have questions.

PREFACE

This manual will introduce you to CalcStar. It is a very easy-to-learn program that lets you dispense with columnar pads forever. This manual will be your friendly "tour guide" as you discover the delights of using your computer to replace many otherwise difficult, time-consuming and even boring tasks. With it, you'll explore all the features of CalcStar by practicing the examples. You may look up detailed information about each feature of CalcStar in the comprehensive index.

As soon as you have configured CalcStar for your terminal, you are ready to go. Follow the chapters in order and you'll soon be a CalcStar expert, wondering how you ever got along without it.

Here are some conventions used in this manual that you should know about.

1. The key marked "Return" (or "Enter" on some terminals) is referred to in the text as <RETURN>; <CR> is used in the examples. They mean the same thing.

2. The Control key (marked "CTRL" or "CTL" or "Control") is indicated by the notation <CTRL>; <CTRL> X, for example, means to hold down the Control key while typing the letter X. Sometimes the notation ^X is used to mean the same thing. (This is not to be confused with the command "^", which is explained in the manual.)

The Control key functions are nearly identical with those found in other MicroPro products like WordStar and DataStar -- an important advantage offered only by MicroPro.

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SECTION I
OVERVIEW

I.1 INTRODUCTION

CalcStar is a valuable tool to assist you in producing professional reports and problem solutions with maximum flexibility, creativity and ease. At last, you can put away your paper, pencils and erasers and use your computer system to create a multitude of reports. The headaches of correcting and editing columns of numbers can now be relieved.

CalcStar can help you to increase the productivity of your organization by taking the fullest advantage of the greater speed, efficiency and flexibility of a computer system.

Some of the possible applications for CalcStar include:

balance statements
cash flow analysis & forecasting
general ledger
inventory records
job cost estimates
market share analysis & planning
patient records
profit projections
profit statements
project budgeting and control
salary records
sales projections & records
tax estimation

With CalcStar you will be manipulating data, either text or numeric, on a visually oriented display. The numeric data may either be constant or be dependent on other data. CalcStar has facilities for editing, formatting, storing, calculating and printing the data that you enter into the computer system.

There's no better way to become familiar with CalcStar than to jump right in and get your feet wet. This manual will strive to lead you clearly through each step of operation of CalcStar so that you will have a thorough knowledge of the possibilities available. To accomplish this, we will use a simple inventory record for an example. There will be plenty of practice for you once each step of operation has been demonstrated.

I.2 ACCESS

We are now ready to introduce the CalcStar main menu. First of all, turn the power on for your machine and insert the proper disk, oriented properly according to the requirements of your system. It is assumed, at this point, that you already know how to boot up CP/M, which you should now do. Make a copy of the CalcStar disk and put the original away in a safe place. Next, it is necessary to configure the system for your terminal.

(Configuring for a printer is not necessary, since CalcStar uses the CP/M list device.) Key in the CP/M command

```
     B>INSTCS <RETURN>
```

This brings up the terminal configuring program. See Appendix D for details on how to use this program if the dialog which is presented is unclear or if your terminal type is not among those listed as available.

Once the terminal is configured you are ready to begin. In response to the CP/M prompt, type

```
     B>CALCSTAR <RETURN>
```

Several seconds later, you will be greeted by a display of the Main Menu.

I.3 MAIN MENU

```
******************************************************************************
* -Cursor Movement- |        -Commands-  ; followed by           | -Misc-    *
*  <CR> Right       |A Auto   F Format  L Load   R Recalc * Extend |@ Curs Pos *
* ^S Left  ^D Right |C Copy   G Goto    M Merge  S Save   = Lock   |? Evaluate *
* ^E Up    ^X Down  |D Delete H Help    O Order  W What   ? Space  |^ Data Togl*
* ^Z Col A next row |E Edge   I Insert  P Print       <TAB> Goto   |<ESC>Cancel*
*Col> |A          |B          |C          |D          |                      *
*Row+------------------------------------------------------------------------*
*  1:>          <                                                            *
*  2:                                                                        *
*  3:                                                                        *
*  4:                                                                        *
*  5:                                                                        *
*  6:                                                                        *
*  7:                                                                        *
*  8:                                                                        *
*  9:                                                                        *
* 10:                                                                        *
*   +------------------------------------------------------------------------*
*               cursor: A1         current: A1                               *
*                                                                            *
* current||       type:                                                      *
* data   ||   contents:                                                      *
*                 edit:                                                      *
*                                                                            *
******************************************************************************
```

This is the CalcStar main menu and should match the display on your screen at this point.

I.4 STRUCTURE

As you can see, CalcStar is displayed in tabular form with column headings and row headings. Let's see what the advantage is to this format.

When writing a report you will be working with words and/or numbers. These are separate, changeable units of information. Life (and report writing) will be much easier if we can work with each of these separate units of information independently of the rest of the report. Otherwise, if one item in the report changes, you must re-type the entire report. With CalcStar you can refer to, and work with, units of information independent of each other by specifying the location of each unit of information through a coordinate which is a combination of the column number and the row number of the item. A13, G27 and P3 are sample coordinate locations.

To use an analogy, imagine yourself at the post office standing in front of a wall of post office boxes. Now imagine that each row is identified by a number (1,2,3...255) and each column is identified by a letter (A,B,C...Z,AA, AB...DV,DW). Thus, we have 255 rows and 127 columns of post office boxes. You can locate the address of any post office box by referring to its coordinate, e.g. A13, G27, P3. Once you locate the post office box you could store mail inside that box.

In CalcStar, memory locations are very similar to post office boxes. Once we specify the address of a memory location (its coordinate), we can store data inside that memory location.

As you can imagine, this structure saves you a great deal of time by not having to erase columns and columns of numbers when one unit of information changes. Instead, you simply change the single unit of information and then everything can be automatically recalculated for you. (These operations will be explained in a later section of this manual.)

I.5 TERMINOLOGY

In order to become more familiar with some of the new terminology that you will encounter on the following pages, here is a brief list of some of these terms

ARRAY refers to the entire matrix (table) of data. The array limits are 127 horizontally and 255 vertically. These are only addressing limits and the actual amount of data that can be stored depends on the memory size of the computer.

WINDOW the computer display screen is limited in size, making it impossible to view all 32,385 array elements at one time. Instead, at any given time, it is positioned onto one subsection of the array. This display section is a window into a small portion of the array. The window shows 10 rows and from 1 to 15 columns.

ROW lines of data in the horizontal direction. The rows are designated as 1,2 ,3...through 255.

COLUMN lines of data in the vertical direction. The columns are designated as A,B,C...through DW.

COORDINATE a position specification in the form 'columnrow'. For example, the top left corner of the array is 'A1'.

ENTRY a single data item in the array. An entry is located by a coordinate.

CURSOR the pointer '>   <' at the current data location.

NOTE

This is a different meaning for the word cursor than you may have encountered previously. In CalcStar the cursor is NOT the little box below the display window.

I.6 FUNCTIONAL OVERVIEW

For orientation purposes, CalcStar can be divided into three sections and then explained according to the function of each of these sections.

A. The upper section of the main menu displays a list of possible cursor movements and operation functions and commands. This section never changes and is included mainly as a directory reminder for you to choose the operation that you need.

B. The middle section is composed of the window into CalcStar the cursor location indicator, the current location indicator, and the direction indicator.

The window allows you to view the report as it stands, including all calculated numerical results that have been entered up to that point. The window can be moved to view any section of the array.

The cursor location is the present coordinate to which the cursor has been moved. When CalcStar is first accessed, the cursor location indicator tells you that the cursor is at location A1. The current location indicator tells you where the next entered data will be stored. As we shall see, the cursor location and the current location can be different. Once the data has been entered, the cursor location 'jumps' to the current location and they are both the same.

C. The lower section of the main menu is where most of the action takes place.

The two items on the left ('current ::' and 'data ::') never change, so you can ignore them from now on. The three lines on the right, however, are very important. Let's summarize their importance:

1. TYPE indicates whether the information stored at the 'current' location is numeric or text (non-numeric). It also indicates in the case of 'text:' whether the entry is displayed on the left side of the column (left-justified), on the right side of the column (right-justified), centered (center-justified), or repeated across the column (repeated).

   If the current location is blank, the type line will be blank. If an entry has been deleted the type line will show that memory space has been allocated, but is currently empty.

2. CONTENTS displays what was entered at the 'current' location. If the entry was text, the contents will display the text. If the entry was a numerical formula, the contents line will display the formula (the calculated results of the formula may be found in the window at the current location). So, the contents line is a reminder for you to see what was entered at the current location.

   The contents line will be blank if the current location is empty.

3. EDIT reflects what you are presently typing in. The edit line will be blank at any location until you start to type an entry. The edit line will show you exactly what you have typed until you hit the <RETURN> (or <ENTER>) key and then what you have typed will move to the contents line and the edit line will be blank. The edit line is also used to access the functions and commands listed in the lower section of the main menu. The line below the edit line is used for system prompts and your responses.

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SECTION II
OPERATIONS

II.1 CALCULATOR FUNCTION

Before starting with an example application it would be helpful to introduce a special calculator function and also the cursor movements in order to assist you in learning to find your way around in the CalcStar array.

The calculator function can be used independently of CalcStar. This saves you from either needing a calculator by your side (or a lot of paper and pencil) or from temporarily putting the calculation you need into an entry in the CalcStar array and then having to remove it. With the calculator function, anytime you need a quick calculation it's available right away.

To utilize the calculator, type in your arithmetic expression on the edit line and follow the expression by a '?'. (NOTE: use '+' for addition, '-' for subtraction, '*' for multiplication,'/' for division, '%' for percentages, 'MAX(list)' to find the maximum value in the list, and 'MIN(list)' to find the minimum value in the list.) For example:

45 + 89?, 25*5?, 125/9.3?, (18 - 36)*6?, 12Ø%18.53333?,

3.14159265359 * 179.4825?,

MAX(E4, F1Ø>F13, H9)?, MIN(A1>L1, B3, AA1>AA12)?

NOTE

The use of parentheses is sometimes necessary to insure that the sequence of arithmetic operations.takes place as you would like it to.

The middle example above illustrates a special feature of CalcStar. The program is accurate to 14 decimal places. The external or displayable accuracy is 12 places, whether the number includes a decimal point or not. The number appearing on the screen will always be accurate to 12 places.

The last two examples above are called system functions and will be discussed thoroughly in a later section of this manual. Briefly, the MAX example will find the maximum value in the list composed of locations E4, F1Ø through F13 (all the locations within that range, i.e. F1Ø, F11, F12 and F13), and H9. The MIN example will find the minimum in the list of values composed of the range A1 through L1 inclusive, location B3, and the range from AA1 through AA12 inclusive. These functions can prove to be very useful by saving you from having to compute each of the values at the given location and then comparing them to come up with the largest or the smallest value.

The answer to your expressions will be displayed on the line below the edit line.

Later, when you are in the middle of a report, you can even use location coordinates in the arithmetic expression and the value at that location will be used in your calculation. For example, 11Ø%F4? will give you the result of taking 11Ø% of the value stored at location F4.

If you enter an expression which evaluates to something divided by zero, the system will display '?n?' to let you know that it cannot perform such an operation. CalcStar has its limits!

II.2 CURSOR MOVEMENTS

We can summarize the ways in which to move the cursor with the following table

ACTION	RESULT
CTRL E (^E)	will move the cursor to the row directly above its present location unless the cursor is in row 1, in which case there would be no movement.
CTRL X (^X)	will move the cursor to the row directly below its present location unless the cursor is in row 255, in which case there would be no movement.
CTRL D (^D)	will move the cursor one column to the right from its present location unless the cursor is in column DW, in which case there would be no movement.
CTRL S (^S)	will move the cursor one column to the left from its present location unless the cursor is in column A, in which case there would be no movement.
CTRL Z (^Z)	If the direction indicator is L-R, CTRL-Z will move the cursor to the first column of the next row unless the cursor is in row 255, in which case there would be no movement. If the direction indicator is T-B, it will move the cursor to the first row of the next column.
<RETURN> or	will move the cursor one column to the right if the edit line is blank unless the direction indicator is T-B. If you have typed an entry on the edit <CR> line, <RETURN> will enter the data into the 'current' location and the cursor will be at the current location. Hit <RETURN> again and the cursor will move one column to the right. If the cursor is in column DW then hitting <RETURN> will cause the cursor to move to the first column of the next line. If the direction indicator is T-B, the movement is down rather than right.

<TAB> will present the prompt

Goto> A1

below the edit line. You may now enter any coordinate on the array and then <RETURN> and the cursor will move to that location. If you would like to jump to the upper left corner of the array (A1) you only need to hit <RETURN> and by default the cursor will jump to A1 (a very useful key!). <TAB> is a synonym for ;G, which is described in detail later.

Take a minute or two to experiment with these cursor movements. When you feel comfortable with the cursor controls then move the cursor back to location A1 and continue with the next section of the manual.

II.3 EXAMPLE INTRODUCTION

CalcStar is designed to be used as a financial report writing system. In this section, we will give you a sneak preview of the advantages of a computer report writer. We will also introduce the example file you will be using to become familiar with CalcStar.

To begin, we will load an existing balance sheet file into the CalcStar array and then demonstrate how we can change a data value and have the system recompute all the values in the report file (this file is also included in Appendix A for reference). After having a sneak preview of the capabilities of CalcStar, we hope you will be enthusiastic about the possibilities and will proceed through the rest of this manual in order to learn all the operations that are available to you in order to produce the best quality reports possible.

For our initial demonstration, follow the steps outlined below. Do not worry about understanding how the operations work as each operation will be discussed in detail in the following sections of this manual.

computer prompt	your response	explanation
edit	;	access command directory
Command	L	access Load command
File Name	BALSHEET<CR>	access balance sheet file
Load position: A1	<CR>	load file with upper left-hand corner at position A1

The window on the CalcStar display should now be filled with the contents of what resembles a balance sheet. Now, duplicate the following steps in order to change an entry on the assets side of the report and, of course, an entry on the liabilities & equity side of the report

computer prompt	your response	explanation
edit	<TAB>	access Goto operation
Goto	B7<CR>	move cursor to location B7
edit	5225850.35<CR>	enter new data at B7
edit	<TAB>	access Goto operation
Goto	B24<CR>	move cursor to location B24
edit	9850.35<CR>	enter new data at B24

We have substituted two new values into our balance sheet report. The totals for both sides are now clearly erroneous. Instead of recomputing all the new totals by hand or by calculator, we may execute the following steps to recompute all the new totals automatically

computer prompt	your response	explanation
edit	;	access command directory
Command	R	access Recalculate command
Recalculate - A)ll E)ntry	A	recompute all values in the balance sheet file

As you can see, once the above steps are executed, all the totals are recalculated to reflect our changes in the data in the balance sheet.

Even though CalcStar is mainly a financial report writing system, we have chosen to use an inventory control report as our example file in this manual. One of our reasons for choosing an inventory report lies in the simplicity of the entries involved in the report. By using an inventory example, no one will be confused with this manual because of their lack of familiarity with financial reports. Everyone can feel at home with an inventory report which basically counts the number of parts you have on hand, how many parts you usually stock, and the resultant number of parts you wish to order. So, we felt that an inventory report would be universally applicable to all and therefore lend to the clarity and usefulness of this manual. A second reason for choosing an inventory report is to demonstrate the wide range of applications available with CalcStar. The CalcStar program may be used for virtually any type of report, not just for financial reports.

In our example, we will enter in a report that lists 8 different sizes of bolts and we will keep track of and manipulate some related information.

We do not need to be concerned with entering a title for our report at the very beginning. When we explain the PRINT operation we will see that we can add a title before the report is printed out.

II.4 TEXT DATA ENTRY

Before we can begin with our inventory example, we must clear the screen of our balance sheet file. In order to clear the screen, follow the steps below. Remember, the operations will be demonstrated later, so don't worry if you do not understand the steps at this time.

computer prompt	your response	explanation
edit	;	access command directory
command	D	access Delete command
Delete: A)ll R)ow C)olumn E)ntry	A	delete entire screen
Verify Y/N	Y	insures deletion is ok

Is the cursor at Al? Good! Notice that the type, contents and edit lines are all blank. Now, type in 'PART #' and then hit the <RETURN> key. The following happens:

1. Since the first character was a 'P', the entry was interpreted as text.
2. Since the entry was interpreted as text, the entry was automatically left-justified (at the left side of the column).
3. When you hit <RETURN>, the entry on the edit line moved to the contents line and 'PART #' also appeared at Al in the window while the edit line went blank.

NOTE

If you make a mistake in typing and catch it before you hit <RETURN>, you may hit the <BACKSPACE> or <DELETE> key to erase one character at a time. If you notice the mistake after hitting <RETURN>, make sure that the current location indicator is the same as the location where the mistake was made and then re-type the entry correctly and hit <RETURN>. This will replace the old entry with the corrected one.

Now, instead of being blank, the middle section of the main menu will show the following

```
..................................................
.                                                .
.           type: text:left justified            .
.       contents: 'PART #'                       .
.           edit:                                .
.                                                .
..................................................
```

Since 'PART #' is a text entry, the screen is correct and agrees with our intention. However, instead of having the entry left justified, we would like it to be right justified because there will be a column of numbers underneath 'PART #' and numbers are always right justified. If the numbers are underneath the text it will help our report to look much nicer. In order to change the entry from left justified to right justified, enter '/R' on the edit line with the cursor at location A1. Our entry now moves over to the right side of the column. Similarly, if you wish to center justify an entry, enter '/C' at the location you would like centered and if you wish to left justify an entry, enter '/L' at the entry location. If everything is correct, we can move on to the next entry.

Move the cursor to location B1. Since we will want all our column labels to be uniform, they should all be right justified. There is an easier way than entering each label and then changing the justification. This time, type in '/RPART NAME' on the edit line and then hit <RETURN>. As you can see, the entry is automatically right justified.

II.5 FORMAT (COLUMN WIDTH) COMMAND

Since there is very little space between the two column labels, it would be useful if there were some way to make the columns wider (or narrower if needed). Report writing could become much more tedious and time consuming if there was no way to specify individual column width, so we have made the extra effort to give you this flexibility. You are allowed up to 26 characters for a data entry, so there will be some situations in which we must widen the column. With CalcStar you can specify columns to be anywhere from 3 to 63 characters wide! Here are the steps to widening a column

computer prompt	your response	explanation
edit	;	access command directory
Command	F	access Format command
P)recision(2) or W)idth(1Ø) or Form Mode(clear)	W	to alter column width
Column B width(3...63)	15<CR>	widen column to 15 spaces

This will result in our column being widened from the standard width of 10 spaces to the width of 15 spaces that we chose. One point to remember is when you widen the location B1, it also widens locations B2 through B255 simultaneously. That is, when you widen one location you are widening the entire column.

NOTE

> If we find that we have accidentally accessed a command operation that we really do not need, we may abort that operation in one of two ways. If the system is waiting for one keystroke only, we may enter <ESC> to return control to the edit line. If the system is waiting for an entry and then a <RETURN>, we need only hit <RETURN> without typing anything else.

Let's move on to location C1. This time, let's change the column width first. This will save us some trouble if we try to enter an entry that is too long for the column.

Here is a summary of actions for column C

computer prompt	your response	explanation
edit	;	access command directory
Command	F	access Format command
P)recision(2) or W)idth(10) or Form Mode(clear)	W	to alter column width
Column C width(3...63)	15<CR>	widen column to 15 spaces
edit	/RSUPPLIER #<CR>	enter data for C1 with right justification

The rest of the column headings will be very similar to what we have demonstrated. So now, you can have an opportunity to practice entering text data. Below is a summary of data that you may enter for columns D through L. If you get stuck, return to the outline of steps for column C and review the procedure.

Column D - format the column to a width of 18 and then enter
'/RSUPPLIER NAME'
Column E - format the column to a width of 11 and then enter
'/RPRICE'
Column F - format the column to a width of 11 and then enter
'/RCOST'
Column G - format the column to a width of 18 and then enter
'/RPROFIT/UNIT'

Column H - format the column to a width of 12 and then enter
'/R%PROFIT'
Column I - format the column to a width of 24 and then enter
'/RQUANTITY STOCKED'
Column J - format the column to a width of 24 and then enter
'/RQUANTITY ON HAND'
Column K - format the column to a width of 24 and then enter
'/RQUANTITY ORDERED'
Column L - format the column to a width of 18 and then enter
'/RCOST/ORDER'

By this time you probably feel like an expert at widening columns and entering right justified text, right?

Now hit the <TAB> key. To the prompt

Goto>

enter <RETURN>. With the cursor at location A1, your screen should match the following

```
*******************************************************************************
* -Cursor Movement- |        -Commands-  ; followed by           | -Misc-    *
*  <CR> Right       |A Auto   F Format  M Merge  R Recalc * Extend |@ Curs Pos *
* ^S Left  ^D Right |C Copy   H Help    O Order  S Save   = Lock   |? Evaluate *
* ^E Up    ^X Down  |D Delete I Insert  P Print  W What   ? Space  |^ Data Togl*
* ^Z Col A next row |E Edge   L Load    Q Quit   G or <TAB> Goto   |<ESC>Cancel*
*Col>|A             |B              |C               |D              |E          *
*Row+--------------------------------------------------------------------------*
*  1:>    PART #<      PART NAME      SUPPLIER #      SUPPLIER NAME            *
*  2:                                                                          *
*  3:                                                                          *
*  4:                                                                          *
*  5:                                                                          *
*  6:                                                                          *
*  7:                                                                          *
*  8:                                                                          *
*  9:                                                                          *
* 1Ø:                                                                          *
*   +--------------------------------------------------------------------------*
*             cursor: A1          current: A1          L-R                     *
*                                                                              *
* current||      type: text: right justified                                   *
* data   ||  contents: PART #                                                  *
*                edit:                                                         *
*                                                                              *
*******************************************************************************
```

II.6 THE GOTO COMMAND

Now scroll to the right to examine the rest of your column labels. At location L1, if everything is correct, duplicate the following steps

computer prompt	your response	explanation
edit	;	access command directory
Command	G	access Goto command
Goto> A1	A2<CR>	move cursor to A2

As with the <TAB> key, if you would like to Goto A1 then you only need to type <RETURN> and by default the cursor will jump to A1. However, if you would like to Goto some location other than A1, simply enter the coordinate and <RETURN> and the default will be overridden and the cursor will jump to the location you have entered.

From the preceding example, we can see that the Goto command is identical to the <TAB> key. The Goto function is so useful that, in case a machine doesn't have a <TAB> key, you can still use the Goto command (but if your machine does have a <TAB> key it's usually easier to use). From now on in this manual, we shall say 'Goto <coordinate>' and let you choose which action to take to get there.

II.7 REPETITION FUNCTION

In order to make our report orderly and attractive, it would be nice to underline the column labels. However, it would be bothersome to hit the underline mark enough times to underline 12 columns.

There is a much easier way to accomplish our goal. What we shall do is underline one column and then copy that underlined column into the next 11 columns. It's even easier than it sounds!

First of all, we want to fill location A2 with dashes and this will give the effect of underlining A1. You can do this in one of two ways. Either we can enter in as many dashes as the field is wide or we can use the repetition function. For reasons which will be obvious in a minute, let's use the repetition function.

With the cursor at A2, enter '/=-'<RETURN>. Once we hit <RETURN> the location A2 is filled with dashes. The repetition function takes whatever string of characters is following the repetition symbol (/=) and repeats it for the entire width of the column, no matter how wide the column is (for an example of a repeated string of more than one character, please refer to APPENDIX A - example #3 - step #15).

II.8 THE COPY COMMAND

Now that we have dashes in one location (A2), we would like to copy them into locations B2 through L2. Here is a summary of how we can use the Copy command to accomplish this in one operation.

computer prompt	your response	explanation
edit	;	access command directory
Command	C	access Copy command
from coord (>coord)	A2<CR>	copy value at A2
to coord (>coord)	B2>L2<CR>	copy into B2 thru L2

Now, there should be dashes throughout row 2 from column A to column L.

NOTE

If we had entered 1Ø dashes at A2 (the field was 1Ø spaces wide) instead of performing the repetition function, when we copied A2 into B2 through L2 we would have had 1Ø dashes in each column and the result would have been less attractive since the columns are all of different widths. What we did was to copy the repetition function (to fill the entire width of the column with the specified characters) from column to column and so the result was dashes throughout each column no matter what its width.

In general, there are four choices with the copy function. You may copy:

1. from an entry to an entry
2. from an entry to a range of entries
3. from a range of entries to a range of entries
4. from a range of entries to an entry

(#4 above is actually a shorthand way of copying from a range into a range. The system will count how many entries are in your range that you are copying from and will copy that range into a range starting from the single entry that you specify. For example, if you say copy A2>C2 into A3, the system will actually copy A2>C2 into A3>C3. So, there are really only three choices with the Copy command.)

There is one other point that should be brought out regarding the Copy command. If you are copying a numerical value or values or a formula into a range of coordinates, then before copying, the prompt will ask

R)elative or N)o adjustment

If the value you are copying will stay constant throughout the range of entries you are copying into, then enter 'N'. If the value is a formula and will change as it is copied from one location into another, then enter 'R' so the formula will be copied and will adjust all the coordinates automatically for you so the formula will be relative to the new location. Examples of both of these operations will be given in this manual.

II.9 NUMERICAL DATA ENTRY

A numerical expression may be entered into any location in the CalcStar array. (Remember: an expression may be constant or variable.) The terms of the expression may be a:

1. number
2. coordinate reference - in which case the coordinate is replaced by the value stored at that coordinate
3. system function - an arithmetic operation which the system already knows how to do without explicit directions. You must specify which function and on what argument list (list of values) the function is to operate. The available system functions for CalcStar are:

    SUM = summation of values in argument list
    CNT = number of items in list that are numerically valued
    AVG = mean value (i.e. SUM/CNT)
    MAX = the maximum value in the list
    MIN = the minimum value in the list
    SQRT = square root
    LOG = logarithim (base 10)
    LN = natural logarithim
    ABS = absolute value
    EXP = exponent

The values that are contained within the argument list of a system function may be any of the following

1. reference coordinate (e.g. F4)
2. range of reference coordinates (e.g. F4>F10)
3. other expressions

With this in mind, it's obvious that there are a very large number of possible ways to manipulate numerical data with a minimum amount of complexity and work. As we proceed, we shall demonstrate some simple applications of many of these possibilities.

We have tried to design CalcStar to be as convenient to use as possible. For this reason the system will display the symbol '?n?' whenever it encounters a numerical expression which evaluates to something divided by zero. This informs you right away of the problem and you may then seek out the solution. If you try to copy such an entry, all the entries you copy into will also show the '?n?' symbol. You may add or subtract values from this entry and the system will simply ignore the undefined expression. However, if you try to multiply or divide this entry by another value the result will be undefined and '?n?' will be displayed in the destination location after the recalculate command has been executed. You will also see the '?n?' symbol if you try to multiply or divide a value by a cordinate which does not have a numerical entry.

In our inventory example, we have eight different sizes of bolts. The part #s on these bolts range from 12345 to 12352 in sequence. Once again, we have two ways in which we could enter this data. We could enter each number individually or we could enter one number and then use a simple formula; then copy that formula into the rest of the locations to result in the right values.

To start, Goto A4. Enter '12345' on the edit line. After you hit <RETURN>, you will notice that the value at the location A4 reads '12345.ØØ'. This is because the system automatically assigns two decimal places to a numeric entry. Since we are handling part numbers (which don't need decimal places), it would be helpful if we could change the number of decimal places to Ø.

II.1Ø THE FORMAT (PRECISION) COMMAND

With the Format Command there is a way to specify from Ø to 1Ø decimal places. The steps to set the decimal precision at Ø are as follows

computer prompt	your response	explanation
edit	;	access command directory
Command	F	access Format command
P)recision(2) or W)idth(1Ø) or Form Mode(clear)	P	alter decimal precision
Column A precision(Ø...1Ø)	Ø<CR>	change decimal precision to Ø

Now, the value at location A4 should read '12345' - our desired number.

NOTE

CalcStar allows you to have a decimal precision of Ø to 1Ø places. You may find your numbers being converted to exponential form if the column width is not large enough (e.g. .ØØØØØ735 would be converted to 7.35E-6 if your column width was 8). A number is displayed with as many decimal places as you specify with the format precision command. Numbers are not rounded but are truncated (cut off). However, CalcStar retains 12 decimal places of precision for calculation purposes.

CalcStar also allows you the possibility of specifying the decimal precision for any individual entry. This means you may have values of different decimal precision even within the same column! One entry may be accurate to 9 places and the value directly below it accurate to 1 place.

The steps to setting an individual decimal precision entry are very similar to the steps for setting the decimal precision for a whole column with one exception as illustrated below

computer prompt	your response	explanation
edit	;	access command directory
Command	F	access Format command
P)recision(2) or W)idth(1Ø) or Form Mode(clear)	P	alter decimal precision
Column A precision(Ø...1Ø)	EØ<CR>	change decimal precision to Ø only at cursor location

To set the decimal precision for an individual entry you must enter 'E' before the number of decimal places. The above steps would change the decimal precision only at the cursor location and not at any other location in the array.

The next step is to determine a formula for calculating what the next part # will be. In this case, since the part #s are in sequence, each part # is determined by adding 1 to the previous part #. So, at location A5, enter '1 + A4'. The middle section of the main menu will show

```
...............................................
.                                             .
.           type: numeric                     .
.       contents: 1 + A4                      .
.           edit:                             .
.                                             .
...............................................
```

This tells you

1. when you entered 1, the entry was interpreted as numeric
2. the contents are equal to 1 plus the value stored at A4
3. the numeric value is automatically right-justified

Notice that in the window at location A5, the value reads 12346.

The main purpose in entering this formula was to be able to copy it into the remaining locations in order to avoid having to enter each part number individually. So, follow these steps to enter the rest of the part numbers

computer prompt	your response	explanation
edit	;	access command directory
Command	C	access Copy command
from coord (>coord)	A5<CR>	copy value at A5
to coord (>coord)	A6>All<CR>	copy into A6>All
R)elative or N)o adjustment	R	value will change from entry to entry

NOTE

> This time we chose 'R' for relative adjustment. If we had chosen 'N' for no adjustment, the result would have been the value 12346 in locations A6 through All because the formula for each location would have been '1 + A4'. But, since 'R' was selected, each value was obtained by adding 1 to the preceeding value (i.e. the formula for A6 became 1 + A5,etc.).

Now, your screen should match the following replication

```
********************************************************************************
* -Cursor Movement- |          -Commands-  ; followed by              | -Misc-   *
*  <CR> Right       |A Auto   F Format  M Merge  R Recalc * Extend |@ Curs Pos *
* ^S Left  ^D Right |C Copy   H Help    O Order  S Save   = Lock   |? Evaluate *
* ^E Up    ^X Down  |D Delete I Insert  P Print  W What   ? Space  |^ Data Togl*
* ^Z Col A next row |E Edge   L Load    Q Quit   G or <TAB> Goto   |<ESC>Cancel*
*Col>|A          |B               |C              |D               :           *
*Row+--------------------------------------------------------------------------*
*  1:     PART #       PART NAME      SUPPLIER #      SUPPLIER NAME            *
*  2:----------- --------------- --------------- ------------------            *
*  3;                                                                          *
*  4:       12345                                                              *
*  5:>      12346<                                                             *
*  6:       12347                                                              *
*  7:       12348                                                              *
*  8:       12349                                                              *
*  9:       1235Ø                                                              *
* 1Ø:       12351                                                              *
*   +--------------------------------------------------------------------------*
*              cursor: A5         current: A5       L-R                        *
*                                                                              *
* current||        type: numeric                                               *
* data   ||    contents: 1 + A4                                                *
*                  edit:                                                       *
*                                                                              *
********************************************************************************
```

II.11 THE ^ FUNCTION

Move the cursor to location B4. We now want to enter the part names for our bolts, which range in size from 1/4 inch to 1 1/2 inch. Part name should be a text entry, but if we enter '1/4" BOLT', the following error message will result

```
Error 7-> 1/4?" BOLT   hit space [B4]
```

When you hit the <SPACE> bar the value at B4 becomes ?n? To avoid this error, you must let the system know that even though the entry begins with a number, it should be stored as a text entry. To change the text type of an entry, type in '1/4" BOLT', BUT BEFORE you hit <RETURN>, hit the '^' key. This will switch the text type from numeric to text (in this case). So, the '^' key allows you to toggle the text type back and forth to fit your data entry.

Once <RETURN> is entered after '1/4" BOLT^', the entry will be left justified. Now enter '/R' to switch the entry to the right side of the column.

This example was to illustrate the use of the '^' key in allowing you the flexibility to enter numbers into text entries and text into numeric entries.

In our inventory example, we can accomplish this same action in another way. Move the cursor to B5 and enter '/R3/8" BOLT'. The system will automatically interpret the '/' as text, since only text can have its position switched (remember that numbers must be right justified).

You may now finish entering the bolt names in locations B6 through B11 with the following data:

at B6	1/2" BOLT
B7	5/8" BOLT
B8	3/4" BOLT
B9	7/8" BOLT
B1Ø	1" BOLT
B11	1-1/2" BOLT

NOTE

Remember to right justify all your entries.

Now it's time for some practice. The data are as follows

1. The 1/4", 3/8" and 1/2" bolts are made by ACME (supplier name, column D) whose supplier number is 35 (column C).

2. The rest of the bolts are supplied by UNIVERSAL whose supplier number is 83.

HINT

Use the Copy command to make your work a lot easier. Remember to right justify your answers and set your decimal precision to the appropriate value.

Now, compare your screen to the following replication

```
********************************************************************************
* -Cursor Movement- |          -Commands-  ; followed by              | -Misc-   *
*  <CR> Right       |A Auto    F Format  M Merge  R Recalc * Extend |@ Curs Pos *
* ^S Left   ^D Right |C Copy    H Help    O Order  S Save   = Lock   |? Evaluate *
* ^E Up     ^X Down  |D Delete  I Insert  P Print  W What   ? Space  |^ Data Togl*
* ^Z Col A next row  |E Edge    L Load    Q Quit   G or <TAB> Goto   |<ESC>Cancel*
*Col>|A            |B               |C               |D                  :       *
*Row+---------------------------------------------------------------------------*
*  1:     PART #        PART NAME      SUPPLIER #      SUPPLIER NAME             *
*  2:---------- --------------- --------------- ------------------              *
*  3:                                                                            *
*  4:       12345      1/4" BOLT              35              ACME      .        *
*  5:       12346      3/8" BOLT              35              ACME               *
*  6:       12347      1/2" BOLT              35              ACME               *
*  7:       12348      5/8" BOLT              83>        UNIVERSAL<              *
*  8:       12349      3/4" BOLT              83         UNIVERSAL               *
*  9:       12350      7/8" BOLT              83         UNIVERSAL               *
*  0:       12351        1" BOLT              83         UNIVERSAL               *
*   +---------------------------------------------------------------------------*
*               cursor: D7          current: D7        L-R                       *
*                                                                                *
* current||        type: text: right justified                                   *
* data   ||    contents: 'UNIVERSAL'                                             *
*                  edit:                                                         *
*                                                                                *
********************************************************************************
```

If this agrees with what you have on your screen, then give yourself a pat on the back. If not, find the place where the difference occurs. If it's in the columns for supplier number or supplier name, then check the steps below. If it's somewhere else on the screen, then refer to the section of this manual (II.9 - II.11) in which that operation was demonstrated to try and locate the error.

If you had trouble with copying the information for supplier number and supplier name, follow through these steps

1. Goto C4

computer prompt	your response	explanation
edit	;	access command directory
Command	F	access Format command
P)recision(2) or W)idth(10) or Form Mode(clear)	P	alter decimal precision
Column C precision(Ø...1Ø)	Ø	set precision at Ø places
edit	35<CR>	enter data at C4
edit	;	access command directory
Command	C	access Copy command
from coord(>coord)	C4<CR>	copy value at C4
to coord(>coord)	C5>C6<CR>	copy value into C5 thru C6

2. Goto C7

computer prompt	your response	explanation
edit	83	enter data at C7
edit	;	access command directory
Command	C	access Copy command
from coord(>coord)	C7<CR>	copy value at C7
to coord(>coord)	C8>C11<CR>	copy value into C8 thru C11

3. Goto D4

computer prompt	your response	explanation
edit	/RACME<CR>	enter data at D4
edit	;	access command directory
Command	C	access Copy command
from coord(>coord)	D4<CR>	copy value at D4
to coord(>coord)	D5>D6<CR>	copy value into D5 thru D6

4. Goto D7

computer prompt	your response	explanation
edit	/RUNIVERSAL<CR>	enter data at D7
edit	;	access command directory
Command	C	access Copy command
from coord(>coord)	D7<CR>	copy value at D7
to coord(>coord)	D8>D11<CR>	copy value into D8 thru D11

II.12 THE SAVE COMMAND

When writing a nice, beautiful report it's a wise idea to occasionally save what you have written, so that there is no chance of it being destroyed. If, for instance, you accidentally hit the <BREAK> key or someone accidentally unplugged your machine, then all your work would be gone and you can guess how that feels.

Now seems to be a good time to save what we have so far produced. Saving a file or a subsection of a file is fairly simple. Just follow these steps

computer prompt	your response	explanation
edit	;	access command directory
Command>	S	access Save command
File name	EXAMPLE<CR>	choose a filename for your file to be saved under. Filename must be 10 characters or less.
Password(<CR> = none):	<CR> or <password>	* see below *
P(artial or A(ll	A	save the entire report

1. If you don't need your file saved under a secret password, enter <RETURN>. After entering <RETURN>, the prompt will tell you that your file has been saved and the control will transfer to the edit line.

2. If you do want your file protected by a password, enter your choice (either one that you can remember easily or that you have written down in a safe place). Remember, the password must be re-entered exactly as you first entered it. After you enter the password, (which will NOT be displayed on the screen), the system will prompt

   Again:

   Enter the password again to verify that you have it right. If you enter a different password the second time, the save command will be aborted and control will return to the edit line.

   If you enter the same password twice, the file will be saved under the filename you specified and the file will be protected against being destroyed or changed because of password protection.

Now that we've saved 'EXAMPLE', let's return to the Save command and illustrate one other point.

computer prompt	your response	explanation
edit	;	access command directory
Command	S	access Save command
File name	EXAMPLE<CR>	access our saved file
File exists. Destroy old contents (y,n)?	*see below*	

1. If you enter 'N', the system will abort the Save command and control will be returned to the edit line. This is to avoid accidentally writing a new file over an already existing file of the same name.

2. If you enter 'Y', and there is no password protecting the file, then the system will prompt

   Password(<CR> = none):

   After this prompt is answered (which is asking if you want the new contents of the file to be password protected) the system will ask if you would like to save only a portion of the array or all of the array. If you only need to save a portion of the array (or would like to store part of the array under another name so you may access either the entire report or a subsection of the report) the system will ask you for the upper left corner of the portion you would like to save and then will ask for the bottom right corner of the subsection you would like to save. If you would like A1 to be the upper left hand corner you may type <RETURN>. Otherwise enter the appropriate location or move the cursor to the location and type '@'. If you would like the bottom right corner to be the cursor location, you may hit the <RETURN> key. Otherwise, enter in the location you would like for the bottom right corner. Once you have entered the coordinates of the subsection of the report you would like to save or you entered 'A' to save the entire report, the system will write the present contents of the CalcStar array into the file over the previous contents.

3. If you enter 'Y', and there is a password protecting the file, the system will prompt

   Verify the password to remove:

   Now, there are two possibilties

   a. if you enter the wrong password, the Save operation will be aborted and control will be returned to the edit line (this demonstrates that your file is protected by the password).

   b. if you enter the correct password, the system will prompt

      Password(<CR> = none):

      This means the old contents have been removed and the system is asking you if you would like to protect the new contents of the file with a password. When the new password prompt has been answered, the system will ask you if you would like to save a portion of the report or the the entire report. If you would like to save only a portion of the report, enter 'P' and the top left and bottom right coordinates of the portion you would like to save. You may use the defaults shown in the prompts or enter in the values you would like. Enter 'A' if you would like to save the entire report. Once you have answered this prompt, the system will acknowledge that the file has been saved and control will transfer to the edit line.

One of the friendly features of the Save command is that the filename is displayed under the bottom left corner of the CalcStar array after the filename under which you would like the file to be saved has been established. This serves as a little reminder.

Saving a partial file can be very useful in conjunction with the Merge command discussed in section II.21.

II.13 ?)STORAGE COMMAND

Before we continue, let's check to see how much storage space we still have available for our report. This will give you an idea regarding how long your report can be.

To execute the ? Storage command, enter ';' and then enter '?'. The system will respond below the edit line with the answer

Room for _______ entries

Numbers will be filled in for the blanks informing you of the approximate number of entries that you can still make.

Make sure to distinguish between the ';?' command (to check storage space) and the '?' function (your built-in calculator function).

NOTE

If you have been entering a long report and the message "Memory Getting Low" appears below the right side of the window, you should not try to enter anything more.

Now, we can enter the data for the price and the cost of the bolts and then calculate the profit/unit and the % profit values.

The price of the 1/4" bolt is $.Ø2 and each of the bolts after that is 4Ø% higher than the previous bolt. Again, we can enter the data for the first entry, then find a formula for the successive entries and copy that formula from location to location.

Move the cursor to location E4. At E4, you can enter the value '.Ø2'. Since the next value is 4Ø% higher than the preceeding value, we can enter the formula '14Ø%E4' at E5. The result in the window at E5 should be .Ø3.

NOTE

Another advantage to writing a formula is, in the event of a price change, you only have to change the initial value and then the prices for the rest of the bolts can be automatically recalculated. (This operation will be demonstrated in a later section of this manual.)

Once you have entered the formula at E5, you can copy the formula with relative adjustments into the locations E6 through E11. By copying with relative changes you will insure that the system will automatically adjust the coordinates within the formula to accurately reflect the correct coordinates. As an example, the formula at location E6 will say 14Ø%E5 (not the original formula of 14Ø%E4). The steps are

computer prompt	your response	explanation
edit	;	access command directory
Command	C	access Copy command
from coord(>coord)	E5<CR>	copy value at E5
to coord(>coord)	E6>E11<CR>	copy into E6 thru E11
R)elative or N)o adjustment?	R	value will change from entry to entry

For simplicity, let's say the cost of the bolts follows the same pattern as the price of the bolts, each one is 4Ø% higher than the previous one. The cost for the 1/4" bolt is $.Ø15. You may have noticed three decimal places for the cost of the 1/4" bolt. As a result, you will need to change the decimal precision for column F to three places. Try it on your own. If you have some trouble, here are the steps

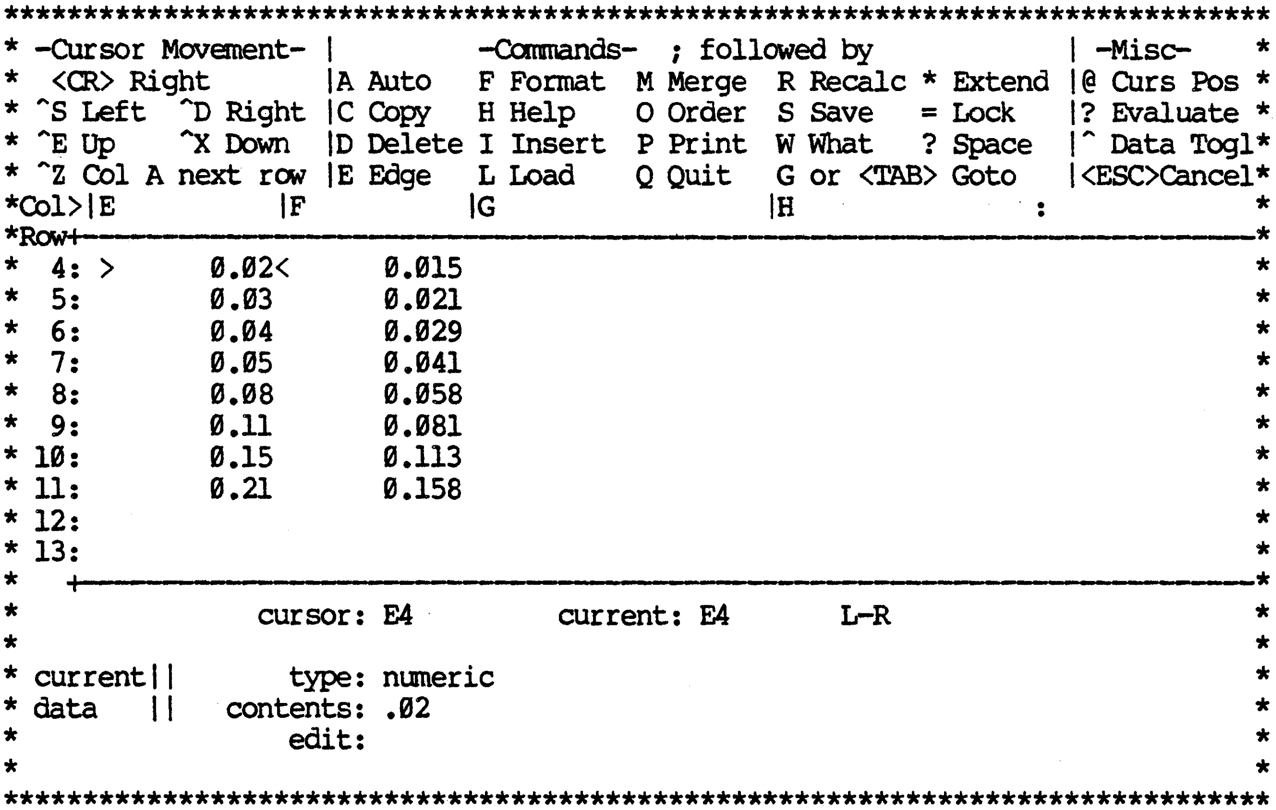
computer prompt	your response	explanation
edit	;	access command directory
Command	F	access Format command
P)recision(2) or W)idth(1Ø) or Form Mode(clear)	P	alter decimal precision
Column F precision(Ø...1Ø)	3<CR>	change precision from 2 to 3 decimal places

Now enter '.Ø15' at F4 and then enter the formula at F5 to show that the next bolt is 4Ø% higher than the previous bolt. Following this, copy the formula into locations F6 through F11 with relative adjustments.

II.14 THE EDGE COMMAND

At the same time we are checking our entries for the prices and costs of our inventory of bolts we can also demonstrate the use of the Edge command. The Edge command locates the cursor and moves the cursor location (the coordinate where the cursor presently is) to the upper left hand corner of the display window and then displays the next 1Ø rows down from the cursor location and however many columns to the right of the cursor location that the screen will fit. This command will be useful in many instances in which you would like to isolate a specific section of data on the display screen.

To execute the Edge command, the first action you should take is to move the cursor to the location that you would like to be the upper left hand corner of the window. We would like to isolate the price and cost values, so move the cursor to location E4. Now, enter ';' and then enter 'E'. Within the window should be two columns of numbers resembling the following illustration



```
****************************************************************************
* -Cursor Movement- |          -Commands-  ; followed by            | -Misc-    *
*  <CR> Right       |A Auto    F Format  M Merge  R Recalc * Extend |@ Curs Pos *
* ^S Left  ^D Right |C Copy    H Help    O Order  S Save   = Lock   |? Evaluate *
* ^E Up    ^X Down  |D Delete  I Insert  P Print  W What   ? Space  |^ Data Togl*
* ^Z Col A next row |E Edge    L Load    Q Quit   G or <TAB> Goto   |<ESC>Cancel*
*Col>|E          |F          |G             |H                :              *
*Row+-----------------------------------------------------------------------*
*  4: >      Ø.Ø2<      Ø.Ø15                                               *
*  5:        Ø.Ø3       Ø.Ø21                                               *
*  6:        Ø.Ø4       Ø.Ø29                                               *
*  7:        Ø.Ø5       Ø.Ø41                                               *
*  8:        Ø.Ø8       Ø.Ø58                                               *
*  9:        Ø.11       Ø.Ø81                                               *
* 1Ø:        Ø.15       Ø.113                                               *
* 11:        Ø.21       Ø.158                                               *
* 12:                                                                       *
* 13:                                                                       *
*   +-----------------------------------------------------------------------*
*              cursor: E4          current: E4        L-R                   *
*                                                                           *
* current||        type: numeric                                            *
* data   ||    contents: .Ø2                                                *
*                  edit:                                                    *
*                                                                           *
****************************************************************************
```

Got it? Very good! If not, take a minute to review the price column again and compare it to your own work. The cost column follows the same procedure, only the decimal precision is set to three places.

Our next task is to calculate the value for the profit made on each bolt sold. As can be expected, we can write a formula and copy the formula from location to location. Since the decimal precision was set to three places in column F for cost entries, it will be necessary to set the decimal precision to three places for column G because the calculations for profit involve the cost entries. Go ahead and set the decimal precision to three places for column G. Refer to the outline of steps covered for changing the decimal precision in column F if you need a reminder.

II.15 THE @ FUNCTION

The @ function is a very useful aid in entering data. This operation will allow you to move the cursor around the screen and when you have located the entry you would like to use, execute the @ function to enter the cursor location into the current location.

There are several ways to enter the formula for profit (i.e. price - cost) into location G4. Here are two of the possibilities (the second alternative utilizes the @ function).

1. At location G4, enter '+E4 - F4'. The '+' sign in front of the 'E' is optional, but it is an easy way to insure that 'E4' is interpreted as a numeric entry rather then a text entry. If you don't use the '+', make sure to use the '^' to change the entry type from text to numeric.

2. a. at location G4, enter a '+' sign
   b. move the cursor to location E4. While you're moving the cursor, notice the current location indicator is remaining at location G4. When the cursor is at location E4, hit the '@' key. As you can see, when you hit the '@' key the system moves the cursor location into the edit line. The '@' key allows you to transfer a value at the cursor location into the current location without having to figure out the coordinate. In order to 'lock' the current location, you will need to type in something on the edit line before moving the cursor. For a numerical entry, a '+' or '-' sign will do and for a text entry, hitting the <SPACE> key will work.
   c. enter a '-' sign.
   d. now move the cursor to F4 and then enter the '@' key and notice the result of F4 in your formula on the edit line.
   e. hit <RETURN> and at the location G4, the contents line will read '+E4 - F4'. This is our formula for the profit per unit.

At first glance this might seem to be more trouble than it's worth, but if you're working down below the 1Øth row, it may be easier to use the @ function rather than pointing your finger on the screen trying to figure out the coordinate of the value you wish to use.

The next step is to copy the formula for profit/unit into locations G5 through G11 with relative adjustments for each entry. After copying the formula you will find that the profits range from .005 (1/2 cent) for the 1/4" bolt to .053 (5.3 cents) for the 1-1/2" bolt.

In order for you to feel at home with the @ function, you may use it in entering the formula for %profit per bolt sold. The formula is profit/unit divided by the price and then multiplied by 100, or G4/E4 * 100.

HINT

Remember to enter a '+' sign before 'G4'.

If your result at location H4 is '25.00', you may assume that you have understood these operations well. If you found the steps a little tricky, we'll take them one step at a time.

1. At location H4, enter a '+' sign
2. Move the cursor to G4 and enter the '@' key '+G4' should now be on the edit line
3. Enter the '/' sign (division sign)
4. Move the cursor to E4 and enter the '@' key
5. Enter ' * 100' (multiply by 100)
6. Hit the <RETURN> key

NOTE

For greater clarity, you could enclose '+G4/E4' in parentheses. The parentheses force the entry to numeric also, so the '^' is not needed.

Finish entering the calculations for % profit by copying the formula at H4 into H5 through H11 with relative changes for each entry.

II.16 THE WHAT COMMAND

Before we proceed any further, let's take a minute to demonstrate another convenient command operation of CalcStar.

A. Simple What Command

Move the cursor to location H11 to the value 25.ØØ. Now, if we were not sure what this value represented we would have to move the cursor up until we could see the column heading and then move the cursor back down to our entry at H11 (Likewise, if there were row headings, we would have to move the cursor to the left and then back again.) Such movement can be frustrating and inefficient, especially if you forget what value you were at. A simple solution to this dilemma is to use the What command. With the cursor at H11, enter ';' and then enter 'W'. Underneath the edit line will appear

```
row, column = ---,% PROFIT
```

This tells us row 11 has no title, but column H has the title '% PROFIT'. Clearly, this convenient operation can save you a lot of trouble when you need to reference specific rows and columns with dependent formulas.

We're now going to let you practice for a little while on the various operations we have discussed so far. The next three columns are 'QUANTITY STOCKED', 'QUANTITY ON HAND', and 'QUANTITY ORDERED'. We'll give you the information for the number of bolts stocked for each size and the number of bolts on hand and let you enter the information and then write a formula to calculate the number of bolts that should be ordered for each size. Remember to use the copy formula whenever you can and use the @ function, if you wish, in writing your formula for the quantity ordered.

The company stocks 5ØØØ bolts of each size. The number of bolts on hand is as follows:

1/4" bolt	212Ø
3/8" bolt	29ØØ
1/2" bolt	378Ø
5/8" bolt	311Ø
3/4" bolt	4195
7/8" bolt	3Ø63
1" bolt	1918
1-1/2" bolt	435Ø

NOTE

Remember, there will be no fractions of a bolt, so set your decimal precision accordingly.

To insure that everything is correct and the operations covered so far have been understood, let's check your results. In column I under 'QUANTITY STOCKED', there should be the integer '5ØØØ' in locations I4 through I11. Now move the cursor to location J4 and use the Edge command (';E') to isolate the last two columns of figures for 'QUANTITY ON HAND' and 'QUANTITY ORDERED'. Your screen should resemble the following replication

```
*******************************************************************************
* -Cursor Movement- |          -Commands-  ; followed by          | -Misc-     *
*  <CR> Right       |A Auto   F Format  M Merge  R Recalc * Extend |@ Curs Pos *
* ^S Left   ^D Right |C Copy   H Help    O Order  S Save   = Lock   |? Evaluate *
* ^E Up     ^X Down  |D Delete I Insert  P Print  W What   ? Space  |^ Data Togl*
* ^Z Col A next row |E Edge   L Load    Q Quit   G or <TAB> Goto   |<ESC>Cancel*
*Col>|J                      |K                    |L                     :    *
*Row+------------------------------------------------------------------------*
*  4:>              2120<                2880                                 *
*  5:               2900                 2100                                 *
*  6:               3780                 1220                                 *
*  7:               3110                 1890                                 *
*  8:               4195                  805                                 *
*  9:               3063                 1937                                 *
* 10:               1918                 3082                                 *
* 11:               4350                  650                                 *
* 12:                                                                         *
* 13:                                                                         *
*   +-------------------------------------------------------------------------*
*            cursor: J4          current: J4        L-R                       *
*                                                                             *
* current||         type: numeric                                             *
* data   ||     contents: 2120                                                *
*                   edit:                                                     *
*                                                                             *
*******************************************************************************
```

The figures in column J are entered straight from the data given and the only change that was needed was to change the decimal precision from two places to zero places. At location K4 (QUANTITY ORDERED), the formula '+I4 - J4' should have been entered and then this formula should have been copied into locations K5 through K11 with relative changes.

Well, take a deep breath. Only one more column of data to calculate. After that, we can really start to have some fun with our report. At location L4 we want to enter a formula (don't be too surprised!) and then copy it through the rest of the column with relative changes in order to show us the cost for this order for each size of bolt.

At location L4 we can enter the formula for cost "times" quantity ordered to give us our results. So, enter '+F4 * K4' to get the cost for this order for the 1/4" bolt. The result in the window at L4 should say '43.2Ø'. $43.2Ø worth of 1/4" bolts are being ordered at this time. Now copy the formula into locations L5 through L11 with relative changes. The results are:

1/4" bolt	43.2Ø
3/8" bolt	44.1Ø
1/2" bolt	35.86
5/8" bolt	77.79
3/4" bolt	46.38
7/8" bolt	156.26
1" bolt	348.Ø9
1-1/2" bolt	1Ø2.77

B. Extended What

Now, in case you think the simple What command is not enough we have gone a step further and included the extended What command. This will be of great help to you if you will be working in a section of the CalcStar array in which you would constantly be needing to execute the simple What command to check whether your column and row location was correct. Instead of executing the simple What command repeatedly the extended What command enables you to 'lock in' the entire top row and the entire first column. As a result all the headings contained within the first row and the first column will be constantly visible for you to refer to in order to insure you are making your changes in the right places.

To show you how helpful the extended What command can be we will demonstrate a typical situation. Move the cursor to location J4 and execute the Edge command by typing ';E'. The result will display numbers corresponding to the QUANTITY ON HAND, QUANTITY ORDERED, and COST/ORDER. However, without the column and row labels in sight it becomes more difficult to distinguish what we are looking at. To execute the extended What command in order to display the column and row labels, first, Goto A1. Then, enter ';='. Answer the prompt

```
Lock: R)ow C)ol B)oth
```

with a 'B'. Finally, Goto J4.

```
********************************************************************************
* -Cursor Movement- |          -Commands-  ; followed by               | -Misc-   *
*  <CR> Right       |A Auto    F Format  M Merge  R Recalc * Extend  |@ Curs Pos *
* ^S Left  ^D Right |C Copy    H Help    O Order  S Save   = Lock    |? Evaluate *
* ^E Up    ^X Down  |D Delete  I Insert  P Print  W What   ? Space   |^ Data Togl*
* ^Z Col A next row |E Edge    L Load    Q Quit   G or <TAB> Goto    |<ESC>Cancel*
*Col>*A          |J                      |K                        |L              *
*Row+-----------------------------------------------------------------------------*
* *1:     PART #        QUANTITY ON HAND          QUANTITY ORDERED                *
*  2:------------ ------------------------- -------------------------            *
*  3:                                                                             *
*  4:     12345 >                  2120<                      2880               *
*  5:     12346                    2900                       2100               *
*  6:     12347                    3780                       1220               *
*  7:     12348                    3110                       1890               *
*  8:     12349                    4195                        805               *
*  9:     12350                    3063                       1937               *
* 10:     12351                    1918                       3082               *
*    +----------------------------------------------------------------------------*
*              cursor: J4          current: J4        L-R                         *
*                                                                                 *
* current||        type: numeric                                                  *
* data   ||    contents: 2120                                                     *
*                  edit:                                                          *
*                                                                                 *
********************************************************************************
```

As a result of executing the extended What command the first row and the first column of the CalcStar array are displayed and columns J, K, and L are moved to the right by one column. Notice that Column A and Row 1 are flagged with an asterisk, indicating that they are "locked" onto the display. Now you are free to move the cursor around as usual and the row and column headings will stay in place so they are available for easy reference. As you move the cursor to the left several times you will notice the screen scrolls before the cursor reaches the 'locked' column. With the column locked it is as if the array starts in the second column. The only way you will be able to move the cursor into column A is if the cursor is in column B and then you may move into column A using the normal cursor movements. This situation is analogous for rows. The only way to move the cursor into row 1 is from row 2; otherwise, the screen will scroll up before reaching the row with the column headings.

With the extended What command you may scroll the cursor to anywhere on the CalcStar array and the row and column headings will adjust to display the correct labels for the respective rows and columns.

It is also possible to lock several rows and/or columns into the display. To accomplish this, place the cursor at the cell that defines the "innermost edge" of the locked area. For example, if you wanted to lock the first two columns and the first three rows, place the cursor at cell B3 before executing the Extended What, or Lock, command.

The Lock command (;=) works as a toggle. That is, if your display is Unlocked, the Lock command will Lock it; if you are in Lock mode, the display will be Unlocked.

You may also Lock only rows or only columns, or both. When the prompt

R)ow C)ol B)oth

appears, the appropriate action will be taken relative to the response and the cursor position. Try it to see what happens.

If you choose any response other than B)oth, the unselected item will toggle. For example, suppose you lock only rows 1 and 2. Then, you decide to lock column A. The rows will now be unlocked. The best course of action to take in this case is to first unlock the rows, position the cursor at A2, and then lock B)oth. If you are ever in doubt about the locked/unlocked status of rows or columns, consult the screen for the presence of asterisks next to the row and column labels.

NOTE:

> If you lock the screen with the cursor too far into the tableau, you may not be able to get the cursor onto the screen, and the message
>
> CURSOR OFF SCREEN
>
> will appear, accompanied by a bell or beep from the keyboard. The best action to take is to Unlock, reposition the cursor in a more useful place, and then Lock.

II.17 SYSTEM FUNCTIONS

Now we have a chance to demonstrate one of the most powerful advantages of a computer report writer. Let's say that we would like to know: the total cost of the order for all bolts, the total number of bolts stocked, on hand and on order, and the number of different bolts. Instead of counting in our heads or on our fingers and toes, the system will compute these values in one step by using system functions.

For instance, instead of writing a formula to add up L4 + L5 + ...L11 (to compute the total cost of the order), we can use one system function to compute it automatically. This would be even more useful if we had 5Ø parts in our inventory. Otherwise, our formulas would become unmanageable.

Goto L12 and use the repetition function (/=) to underline the column with dashes ('/=-'). Now, at location L13, enter '+SUM (L4>L11)'. This will tell us

1. '+' - the entry is numeric, not text. You could also use the '^' key.

2. 'SUM' - the system function to calculate the sum of the given list of values.

3. '(L4>L11)' - the range of values to be summed. Single values may be separated by commas and a range of values may be shown as they are in this example. You may sum any values from anywhere in the CalcStar array.

Once the above function is entered at L13, you should see the result of 854.48 in the window at L13. This means the total cost of the order was $854.48. Wasn't that easy?

Now, we can give you a little practice at working with system functions. Goto I12 and underline the column and then copy that to J12 through K12. Next, Goto I13 and then enter the SUM function as shown above, with the range of I4 through I11. This will inform us of the total number of bolts that should be in the store (the result should equal 40000). You may repeat the SUM function for column J to find that we actually have 25436 bolts on hand.

For column K, we can calculate the quantity ordered in one of two ways. We can either

1. Perform the SUM function for the range K4 through K11

   or

2. Subtract the total quantity on hand from the total quantity stocked ('+I13 - J13'). (HINT: This method will compute a little more quickly than if you use a system function.)

Either calculation will result in the correct answer of 14564 bolts on order. We will leave it up to you as to which you would like to use.

We will demonstrate the use of one other system function. Goto A12 and underline the column as we have done previously. Here we want to know how many different bolts we carry in our inventory. If we were to use the SUM function, we would calculate the summation of all the part numbers, but that would not be the right answer. Instead, we will use a system function called CNT (count) which will count the number of numerically valued entries in the argument list.

At location A13, enter 'CNT (A4>A11)^' ('^' is to switch the entry type from text to numeric). The result in the window at A13 will show '8'. We carry 8 different sizes of bolts. For clarification purposes, enter 'BOLTS' at location B13. The contents will be left justified and since the '8' is right justified, the result of columns A and B will show '8 BOLTS'.

For a list of other system functions that are available to you, please refer to section II.9 of this manual.

II.18 THE \ FUNCTION

The '\' function will allow you the opportunity to include a non-evaluative comment in a numeric entry in the CalcStar array. This is very handy in case you are working in a section of the array where you cannot see the column and row headings easily. At the end of your numeric entry, enter '\<comment>' and the comment you insert can serve as a convenient reminder of what the entry represents. Your comment will not appear in the CalcStar window or on a printout, but will be displayed on the contents line for the location with the comment insertion.

As an example, move the cursor to location K13. This time enter '+SUM (K4>K11)\total ordered'. The comment is not displayed in the window, but appears on the contents line.

For your own practice, try entering comments at a couple of other locations. Be sure to hit the '\' key and not the '/' key.

NOTE

> The '\' key is not found on the TRS - 8Ø keyboard, but may be entered by hitting '<CTRL> 9'.)

Take a minute to congratulate yourself - you have just finished a very thorough and accurate inventory record. All that remains to be demonstrated are commands to edit the file, print the file, quit the program and load the file back into CalcStar.

Before we make any changes, let's save the file again to make sure it is safe. Here are the steps if you need a reminder.

computer prompt	your response	explanation
edit	;	access command directory
Command	S	access Save command
File name	EXAMPLE<CR>	choose filename that you wish contents saved under
File exists. Destroy old contents (y,n)	Y	update file to include the latest entries
Password (<CR> = none)	<CR>	no specified password

II.19 THE RECALCULATE COMMAND

Next we may demonstrate one of the most useful commands of CalcStar. After completing our inventory file, imagine you are handed a memo saying the cost of all bolts has increased 1Ø%. Since our values for cost, profit/unit, % profit and cost/order are all involved, this could be catastrophic information. Instead of drying your tears as you erase four columns of numbers, you can change one number and use one command to recalculate everything automatically.

The first step is to use the calculator function to compute the new cost for the 1/4" bolt. On the edit line, enter '11Ø%F4?'. This will inform you that the new cost of the 1/4" bolt is .Ø17. Now move the cursor to location F4. Enter the value '.Ø17' and check to see that the new value is displayed in the window at location F4. To execute the Recalculate command, duplicate the following steps

computer prompt	your response	explanation
edit	;	access command directory
Command	R	access Recalculate command
Recalculate - A)ll or E)ntry	A	we want all values to reflect the new cost, so recalculate all values.

The Recalculate command allows you to either recalculate all the formulas in the array or an entry that you specify. In our example, since profit/unit, % profit and cost/order were all influenced by the increased cost, we wanted the new figures for profit/unit, etc. But, in case you would like to recompute only one entry while leaving everything else as it is, you may enter 'E' to recalculate the entry at the current location. If you enter 'A' to recalculate all the formulas the Recalculate command examines each row and recomputes any formulas in that row, so that if any value which is used in a formula has changed, then the recalculated value will now appear on the screen. The system functions (e.g. SUM) are included in the Recalculate command and you can move the cursor to location L13 to verify that the total cost of this order has increased from its previous value to a new value of $968.41. You may also check locations A13, I13 and K13 to verify that our new information was included in the recalculated values for the system functions. (QUANTITY ON HAND did not change because the value added was Ø).

NOTE

If you try to recalculate an entry that contains text, the system simply does not calculate the entry and control returns to the edit line.

Isn't that easier than wearing out your paper with an eraser? Imagine how much easier the Recalculate command would make your work if you were working from an approximate value towards an exact value. The use of the Recalculate command will be demonstrated several more times in the remainder of this manual.

We should remind you of one point. Any entry which evaluates to something divided by zero will yield the '?n?' symbol upon recalculation. This symbol will also be displayed in any entries which are multiplied by or divided into or divided by an entry which equals a value divided by zero. For instance, if, at location A1, the value after recalculation is equal to 5/Ø and location B1 contains the formula A1*A3 or A1/A3 or A3/A1 the '?n?' will be displayed in locations A1 and B1.

II.2Ø THE ORDER COMMAND

The operation that goes hand in hand with the Recalculate command is the Order command. The Order command determines which direction the Recalculate command moves in. Normally, the entries in the array are evaluated in a left to right direction through each column and then moving down to the next row and then moving from the left to the right and then to the next row and so on until all the rows have been evaluated. The Order command switches this order of evaluation so that entries are computed moving from top to bottom in each column and then moving one column to the right and moving from top to bottom again and so on until all the columns have been evaluated.

order of evaluation

left-to right top-to bottom

1	2	3	4	5
6	7	8	9	1Ø
11	12	13	14	15
16	17	18	19	2Ø

top-to-bottom left-to-right

1	5	9	13	17
2	6	1Ø	14	18
3	7	11	15	19
4	8	12	16	2Ø

This diagram illustrates the two sequences of evaluation available with the Order command. The Order command is sometimes necessary because the Recalculate command, in moving through its usual order of evaluation (left-to-right top-to-bottom), may encounter a formula that depends on a value at a coordinate that has not been evaluated yet and so the result at our formula will not be correct. For instance, if there were a formula at location D2 and the result of this formula depended on the value at B6, and if the value at B6 changed, then, when the Recalculate command was executed, the formula at D2 would be evaluated before the new expression at B6, and the result at D2 would be incorrect. If you were to switch the Order of evaluation, however, the value at B6 would be reached before the formula at D2 was recalculated and the result would be correct.

To execute the Order command, follow these steps

computer prompt	your response	explanation
edit	;	access command directory
Command	O	access Order command and will switch the evaluation order each time it is executed. The current mode is displayed on the lower right section of the screen.

NOTE

Remember that left-to-right top-to-bottom is the standard order of evaluation. Order also affects the action of the <RETURN> and CTRL-Z. See section II.35 for further reference.

II.21 THE MERGE COMMAND

With the Recalculate command, you may produce new reports with new figures while preserving all the text entries of your original report so that you do not need to write an entire report over just because the numerical data changes. There is another and perhaps easier way to preserve the report text while maintaining the ability to substitute new numerical data. The Merge command is especially helpful if you want to preserve your report text, but, because of complex dependencies and/or too many changing variables, the Recalculate command would be too complex to use to change numerical data.

The Merge command allows you to create two or more separate files and then superimpose the files, one on top of the other. In our EXAMPLE file, we could create a standard inventory file which would contain the entries in columns A, B, C, D; contain the column headings for columns E, F, G, H; contain the entries for column I (the quantity stocked is constant); contain the column headings for columns J, K, and L. Let's call this file 'STDINV' for standard inventory.

In order to clearly understand the Merge command, we will include screen replications of what our fantasy files would look like if we were to go ahead and create them. You do not need to actually create them since this would involve quitting our present EXAMPLE file and the Merge command can be sufficiently understood by following along here in the manual. Illustrated below is the screen display that would result if we were to isolate columns C, D, E and F in our STDINV file.

```
********************************************************************************
* -Cursor Movement- |          -Commands-  ; followed by            | -Misc-    *
*  <CR> Right       |A Auto   F Format  M Merge  R Recalc * Extend |@ Curs Pos *
* ^S Left  ^D Right |C Copy   H Help    O Order  S Save   = Lock   |? Evaluate *
* ^E Up    ^X Down  |D Delete I Insert  P Print  W What   ? Space  |^ Data Togl*
* ^Z Col A next row |E Edge   L Load    Q Quit   G or <TAB> Goto   |<ESC>Cancel*
*Col>|C             |D                  |E           |F          :              *
*Row+---------------------------------------------------------------------------*
*  1:>     SUPPLIER #<     SUPPLIER NAME        PRICE         COST              *
*  2: ---------------- ---------------- ------------ ------------               *
*  3:                                                                           *
*  4:              35             ACME                                          *
*  5:              35             ACME                                          *
*  6:              35             ACME                                          *
*  7:              83        UNIVERSAL                                          *
*  8:              83        UNIVERSAL                                          *
*  9:              83        UNIVERSAL                                          *
* 1Ø:              83        UNIVERSAL                                          *
*    +--------------------------------------------------------------------------*
*               cursor: C1          current: C1       L-R                       *
*                                                                               *
* current||       type: text: right justified                                   *
* data   ||   contents: SUPPLIER #                                              *
*                 edit:                                                         *
*                                                                               *
********************************************************************************
```

As you can see, the values for the price and cost of all the bolts have been left out of the STDINV file. The reason for this is the information contained in the STDINV file is subject to very little change and therefore can be stored in a separate file and used whenever needed. All the information that is subject to change can be stored in other files and then, when the Merge command is executed, the two files can be combined into one. Yet, even when the two files are combined, your original STDINV file is stored in its original condition on the disk to be used again whenever you wish.

Now, we could create another file called 'INVDATA' (inventory data) which would store the changeable values including: price, cost, profit/unit, % profit, quantity on hand, quantity ordered and cost/order. All of these numbers are subject to change. Now we can take a look at the screen display for the INVDATA file at the same location of the array as the screen display for the STDINV file.

```
********************************************************************************
* -Cursor Movement- |          -Commands-  ; followed by           | -Misc-     *
*  <CR> Right       |A Auto    F Format  M Merge  R Recalc * Extend |@ Curs Pos *
* ^S Left  ^D Right |C Copy    H Help    O Order  S Save   = Lock   |? Evaluate *
* ^E Up    ^X Down  |D Delete  I Insert  P Print  W What   ? Space  |^ Data Togl*
* ^Z Col A next row |E Edge    L Load    Q Quit   G or <TAB> Goto   |<ESC>Cancel*
*Col>|C             |D                   |E          |F            |            *
*Row+--------------------------------------------------------------------------*
*  1:>              <                                                          *
*  2:                                                                          *
*  3:                                                                          *
*  4:                                          Ø.Ø2        Ø.Ø15               *
*  5:                                          Ø.Ø2        Ø.Ø21               *
*  6:                                          Ø.Ø3        Ø.Ø29               *
*  7:                                          Ø.Ø5        Ø.Ø41               *
*  8:                                          Ø.Ø7        Ø.Ø57               *
*  9:                                          Ø.1Ø        Ø.Ø8Ø             - *
* 1Ø:                                          Ø.15        Ø.112               *
*    +-------------------------------------------------------------------------*
*               cursor: C1          current: C1        L-R                     *
*                                                                              *
* current||        type:                                                       *
* data   ||    contents:                                                       *
*                  edit:                                                       *
*                                                                              *
********************************************************************************
```

The INVDATA file contains only the numerical data information that is variable. Therefore, instead of writing an entirely new report each time the data changes or having to try and edit a file with complicated dependencies and formulas, we can create a new file with the new data and then merge the new file with our STDINV file. The Merge command will also be useful if we have several files of data. We can perform the merge operation and then print or display the results and then merge two more files and print or display the results and so on. By using the Merge command you do not need to spend the time re-entering and recalculating numerical data.

Something that is especially useful is the ability to choose the location for the upper left hand corner of any of the Merge files. This will allow you to design little modules and then you will be able to mix and match them however you choose on the CalcStar array to produce a wide variety of report and model combinations and be able to greatly minimize duplicated work.

The steps to merge the two files are as follows

computer prompt	your response	explanation
edit	;	access command directory
Command	M	access Merge command
File name	STDINV<CR>	merge INVDATA with our other fantasy file called standard inventory
Load position: A1	<CR>	we would like the upper left corner of STDINV to be at A1

The results of merging our STDINV file with our INVDATA file at the same location as the illustrations above is shown below.

```
******************************************************************************
* -Cursor Movement- |          -Commands-  ; followed by             | -Misc-    *
*  <CR> Right       |A Auto    F Format  M Merge  R Recalc * Extend |@ Curs Pos *
* ^S Left  ^D Right |C Copy    H Help    O Order  S Save   = Lock   |? Evaluate *
* ^E Up    ^X Down  |D Delete  I Insert  P Print  W What   ? Space  |^ Data Togl*
* ^Z Col A next row |E Edge    L Load    Q Quit   G or <TAB> Goto   |<ESC>Cancel*
*Col>|C             |D                   |E              |F          |           *
*Row+--------------------------------------------------------------------------*
*  1:>    SUPPLIER #<    SUPPLIER NAME        PRICE        COST                *
*  2: ------------- ------------------ ----------- ----------                *
*  3:                                                                          *
*  4:              35              ACME        Ø.Ø2       Ø.Ø15                *
*  5:              35              ACME        Ø.Ø2       Ø.Ø21                *
*  6:              35              ACME        Ø.Ø3       Ø.Ø29                *
*  7:              83         UNIVERSAL        Ø.Ø5       Ø.Ø41                *
*  8:              83         UNIVERSAL        Ø.Ø7       Ø.Ø57                *
*  9:              83         UNIVERSAL        Ø.1Ø       Ø.Ø8Ø                *
* 1Ø:              83         UNIVERSAL        Ø.15       Ø.112                *
*   +-------------------------------------------------------------------------*
*            cursor: C1          current: C1       L-R                         *
*                                                                              *
* current||        type: text: right justified                                 *
* data   ||    contents: SUPPLIER #                                            *
*                  edit:                                                       *
*                                                                              *
******************************************************************************
```

The result of the Merge command is the combination of both the STDINV file and the INVDATA file onto one screen, and this will exactly duplicate our EXAMPLE file with all information included.

The only caution with the Merge command is that the file being merged on the screen will override the original file in terms of the column widths, precisions, etc. If both files have entries in the same location, the entry from the file being Merged onto the array will replace the entry which was originally on the array. This is why it is a good idea to put your files together in little modules rather then spread out templates.

When you Merge a file onto the array with the upper left hand corner at a different location than when you originally created it there is a potential for disaster since formulas which use entry locations are not located in the same place as the file they were created in. CalcStar takes care of this problem by adjusting formulas when they are moved into the Merged file. This is true for all formulas which reference locations within the module being merged. However, any formulas which reference locations outside of the module being transported will not yield correct results in the resulting file because the resulting file probably will not contain the same data at the external location as the file from which the module with the external referencing formula was taken. The moral of the story is to be sure that all modules you are merging into new files only contain formulas which reference locations internal to the module.

II.22 THE INSERT COMMAND

Now is a good time to demonstrate a very important editing operation which allows you to insert a column or row into your report. This becomes very handy if you have some new information which you need to add to your report, but you presently do not have the room.

Let's imagine, once again, another memo has been handed to you from upstairs informing you that the company has started to stock a new item - a 1-1/4" bolt. The company would like you to add this new item to your inventory and include it on your present report. Of course, if we didn't have CalcStar, we would have to start all over and write a new report. With CalcStar, however, we can insert a row and add the information for your new bolt and then have CalcStar recalculate all the formulas.

Move the cursor to All (the cursor may actually be anywhere on row 11). To execute the Insert command, follow these steps

computer prompt	your response	explanation
edit	;	access command directory
Command>	I	access Insert command
Insert: R)ow C)olumn	R	insert a row for our new information

Row 11 has now been moved down to become row 12, row 12 has been moved down to become row 13 and row 13 has become row 14. Row 11 is now a blank line. So, CalcStar will automatically renumber rows and columns to account for newly inserted rows and columns and will transfer all data to the newly renumbered rows and columns.

Now we can enter the new information for our addition to the inventory file. The data are as follows:

part # --- 1 + A11
part name --- 1-1/4" BOLT
supplier # --- 35
supplier name --- ACME
price --- .18
cost --- .151
profit/unit --- +E11 - F11
% profit --- +G11/E11 * 1ØØ
quantity stocked --- 5ØØØ
quantity on hand --- Ø
quantity ordered --- 5ØØØ
cost/order --- +F11 * K11

You may use the Recalculate command to recompute all the totals to include the information you have just added to the file. So, within five minutes of receiving the memo you can present the new report information. Doesn't that make you sigh in relief?

In the same way you inserted a row, you may also insert a column. If, for instance, you would like to add a new category of information in your file, you may do so by inserting a column wherever you would like. As an illustration, you could insert a column for the supplier phone number (for placing orders). With the cursor at the price column, you could insert a column by following the steps outlined above and entering 'C' (for column) instead of 'R' (for row). This would leave column E blank and would move each of the other columns over one column to the right. You could now enter in your supplier phone numbers in column E. At this point, we will leave the supplier phone number column out of our EXAMPLE file.

The editing function that goes hand in hand with the Insert command is the Delete command which we shall now describe.

II. 23 THE DELETE COMMAND

As a result of another infamous memo we now find we must delete some information from our file. Based on a marketing study, the company has made a decision to stop carrying the 1-1/2" bolt. This memo becomes effective with our current report and so we must change it again. As a result, we will have to delete all the information pertaining to the 1-1/2" bolt and recalculate the total: cost/order, quantity ordered, quantity on hand, quantity stocked and the number of different bolts. Again, without CalcStar, this would mean rewriting the entire report and recalculating all the values. Instead, we may use one command to delete the information and use one other command to recalculate all the formulas and our report will be updated.

Move the cursor to location A12. To execute the Delete command, duplicate the following steps

computer prompt	your response	explanation
edit	;	access command directory
Command	D	access Delete command
Delete: A)ll R)ow C)olumn E)ntry	R	to delete the row in which the cursor is located

If you have performed the above steps, the following error message will be displayed

ERROR: would delete ref(s) at A14, I14, J14, L14

As you can see, the Delete command will not let you delete any location which has other values dependent on it. This is a blessing since you could accidentally delete values which would cause many other values to become undefined as a result. In order to delete entries that have other values dependent on them, you need to change the formulas that are dependent on the values you would like to delete and then the system will let you delete them.

In order to change the formulas that are dependent on the row which we would like to delete, follow these steps

1. Goto A14. Change the entry to '+CNT (A4>A11)'
2. Goto I14. Change the entry to '+SUM (I4>I11)'
3. Goto J14. Change the entry to '+SUM (J4>J11)'
4. Goto K14. Change the entry to '+SUM (K4>K11)'
5. Goto L14. Change the entry to '+SUM (L4>L11)'

Move the cursor to location A12. Now repeat the above steps to execute the Delete command. This time, after you enter 'R' to let the system know that you would like to delete row 12, the prompt will ask

verify Y/N -

This prompt insures that you really would like to make the deletion that you say you want to. It insures against accidentally deleting something that you really would like to save. If you answer 'N', the Deletion command will be aborted and control will return to the edit line. If you answer 'Y', the deletion will occur and then any following rows or columns will be moved up or to the left to fill in the gap of the deleted row or column.

The other deletion choices besides row are:

entry If you enter 'E' for the deletion prompt, the system will delete the entry at the current location indicator without asking to verify the deletion. If there are other values dependent on the entry you would like to delete, the deletion **WILL** occur.

column If you enter 'C' for the deletion prompt and there are no other values that are dependent on any of the values in the column you are trying to delete, then the system will ask you to verify the deletion. If you enter 'N', the deletion will not occur. If you enter 'Y', the deletion will occur. If there are any values anywhere in the report that are dependent on any of the values in the column you are trying to delete, the deletion will not occur and an error message will be displayed.

all If you enter 'A' and then enter 'Y' to verify the deletion, all the information on the screen will be deleted. Whatever is still on the disk from the last time you saved the file will still be safe and available for you to load back into CalcStar, BUT all the changes made since the last time you saved the file will be erased. If you answer 'N' to the prompt to verify the deletion, the deletion will not occur and control will return to the edit line.

II.24 CONDITIONAL EXPRESSIONS

We may now introduce one of the most sophisticated abilities of CalcStar. The ability to incorporate conditional statements into a financial report generating system is very useful. A conditional statement will evaluate the condition you enter and then, depending on whether the condition is true or false, the system will execute one statement you specify if the condition is true or else it will execute another statement that you may specify if the condition is false. This opens up virtually unlimited possibilities; so, let's demonstrate a simple example and then generalize on further possibilities.

For our first conditional example, let's examine the case of what happens when we have more parts on hand than we usually stock for any one particular good. As the report stands at this time, when the amount on hand is subtracted from the amount stocked, a negative answer will result. This answer is multiplied by the cost and will yield a negative total cost for amount ordered of this part. This presents a problem since it is doubtful we will be able to get our suppliers to pay us for ordering parts from them! Our solution is to use a conditional expression to determine whether the amount on hand is greater than the amount stocked. If it is, the amount ordered will become Ø. If the amount on hand is less than the amount stocked, then we will subtract in the way we have been doing in order to find out how many parts we should order. Are you ready to try this out? The summary of actions is shown and you may follow along and then we will explain the general form of how to enter conditional statements. First, move the cursor to location K4.

computer prompt	your response	explanation
edit	+J4<I4:I4-J4<CR>	IF the amount on hand (J4) is less than amount stocked (I4), THEN subtract J4 from I4 and enter into K4, ELSE the value at K4 will be Ø because a false conditional statement is assigned the value of Ø
edit	<TAB> (or ;G)	access Goto command
goto> A1	J4	move to J4
edit	6ØØØ<CR>	change data entry to tell us we have 6ØØØ parts on hand
edit	;	access command directory
Command	R	access Recalculate command
Recalculate - A)ll E)ntry	A	recompute results to reflect new data

Now the result in K4 will show that the quantity ordered is Ø. This is very helpful for us in keeping our records straight and not to try and order negative amounts of a part. If you would like, you may take a minute to check all the totals influenced by this change and see that they are correct. Isn't that fantastic? Now to check that the conditional statement works the other way, enter '212Ø' at J4 (this was our original amount) and then recalculate to display our original totals.

Let's take a minute to describe the general format of a conditional statement before going on to the next step. The general format of a conditional statement is

```
condition:executable statement if condition is true:executable
    statement if condition is false
```

Translating the conditional statement to English might result in the following: "IF the condition is true, THEN execute the first set of statements, ELSE (otherwise) execute the second set of statements". Let's review some points about each of the three parts included in a conditional statement.

condition

the condition may include numerical values and coordinate references. Be careful to only include single coordinates, since the symbol for a range ('>') would be interpreted as the relational operator "greater than". To be able to include ranges of values, use a system function to sum or average, etc. The values may be operated on by relational operators, logical operators, arithmetic operators and any combination of the three. The relational operators included are:

<	(less than)
<=	(less than or equal to)
=	(equal to)
<>	(not equal to)
>=	(greater than or equal to)
>	(greater than)

The logical operators included are:

*	(logical AND, the intersection of two values. Typically, both values must be true for the entire expression to be true)
+	(logical OR, the union of two values. Only one of the two values will need to be true for the entire expression to be true). This operator has lower precedence than AND (*)

The arithmetic operations included are the same as you have already been working with in CalcStar (e.g. addition, percentage, etc.). For numerical manipulation with conditions evaluated to true or false, the true condition will assume a numerical value of 1 and the false condition will assume a numerical value of Ø.

executable statement if condition is true

after the first colon (':') you may enter the statement you would like to be executed if the condition is true. This statement will be executed only if the condition is true. The statement may be a number, a coordinate, a formula involving any combination of both, or a string of characters enclosed in double quotes (e.g. "yes"). If you enter a condition followed by two colons, the value assigned will be zero if the condition is true.

executable statement if condition is false

after the second colon you may enter a statement you would like to be executed if the condition is evaluated to be false. This statement is optional and if you do not enter a statement, Ø will be entered if the condition is false. This was the case with our first example above. The statement may be a number, a coordinate, a formula involving any combination of both or a string of characters enclosed in double quotes.

With all this in mind, we may now go on to demonstrate a few additional examples involving conditional statements.

For our second example, we may attack the same problem we solved in our first example, except we will solve it in an alternative way. With the cursor at K5, enter '(J5<I5)*(I5-J5)'. This will evaluate the first expression '(J5<I5)' and if the condition is true, the expression is assigned a value of 1 and 1 is multiplied by the result of the second expression '(I5-J5)' to obtain the number of parts on order which is entered into location K5. If the first expression is false, the expression is assigned a value of Ø and Ø is multiplied by the second expression to obtain a result of Ø. So, this expression will yield the same result as the first example. To verify this, change the on hand amount (J5) to '7ØØØ' and then recalculate and observe the amount ordered to be 'Ø' at K5. Again, to check that the 'true' value of the conditional statement evaluates properly, re-enter '29ØØ' at location J5 and then recalculate and compare these totals to our original totals.

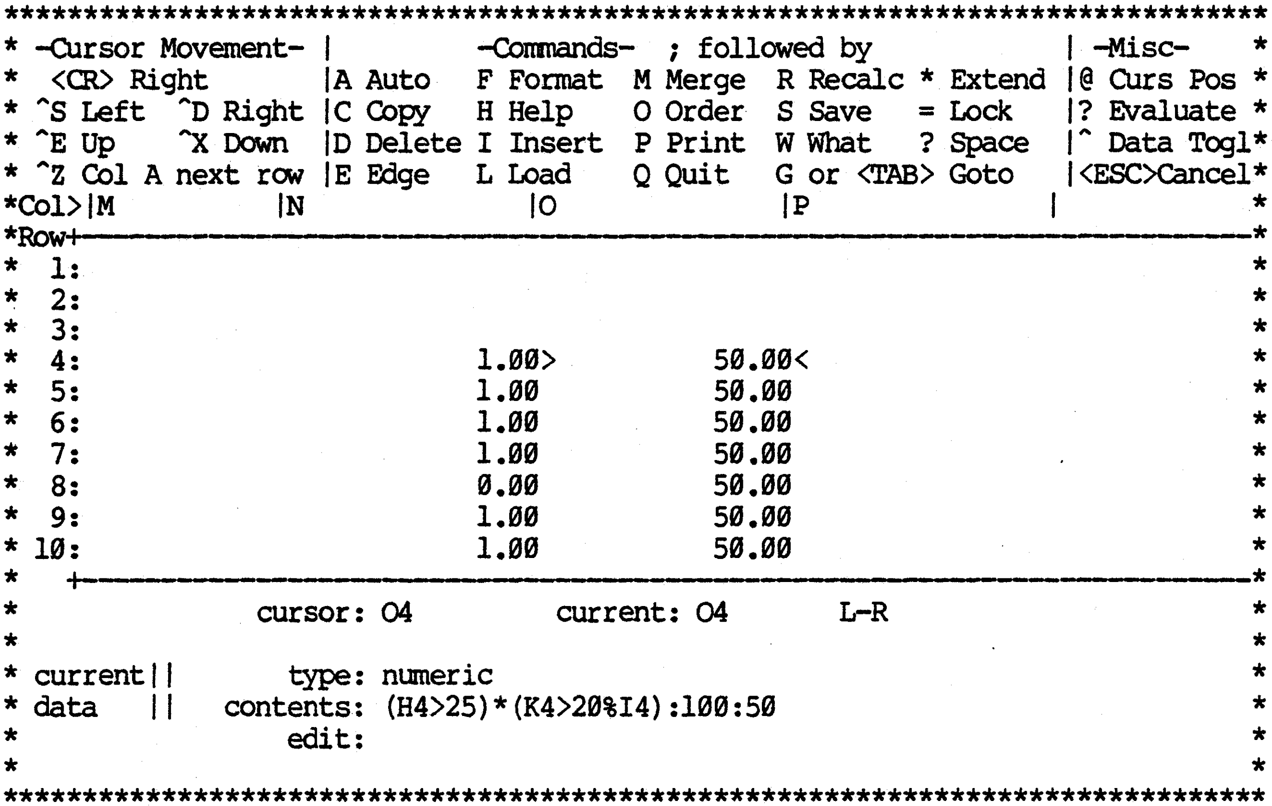
In our third example we will demonstrate the use of the OR logical operator. In this example, you may imagine that the management has asked you to compose a list of all the parts in which the percentage profit is greater than 25% OR the quantity on order is more than 2Ø% of the quantity that is usually stocked. This is a list of your best selling parts or your parts that bring in the most profit. A part may satisfy either one of these conditions to get on the list. Since this is not a part of your official report, but you would like to keep it in the same file in order to be able to print the list later, we will move the cursor out to column N to store our list.

At location N4, enter '(K4>2Ø%I4)+(H4>25.ØØ)' and then copy the formula into locations N5 through N11 with relative changes. The following screen display will occur

```
******************************************************************************
* -Cursor Movement- |         -Commands-  ; followed by          | -Misc-    *
*  <CR> Right       |A Auto   F Format  M Merge  R Recalc * Extend |@ Curs Pos *
* ^S Left  ^D Right |C Copy   H Help    O Order  S Save   = Lock   |? Evaluate *
* ^E Up    ^X Down  |D Delete I Insert  P Print  W What   ? Space  |^ Data Togl*
* ^Z Col A next row |E Edge   L Load    Q Quit   G or <TAB> Goto   |<ESC>Cancel*
*Col>|M           |N              |O               |P              |          *
*Row+-----------------------------------------------------------------------*
*  1:                                                                        *
*  2:                                                                        *
*  3:                                                                        *
*  4:             >          1.ØØ<                                           *
*  5:                        1.ØØ                                            *
*  6:                        1.ØØ                                            *
*  7:                        1.ØØ                                            *
*  8:                        Ø.ØØ                                            *
*  9:                        1.ØØ                                            *
* 1Ø:                        1.ØØ                                            *
*    +----------------------------------------------------------------------*
*              cursor: N4          current: N4        L-R                    *
*                                                                            *
* current||      type: numeric                                               *
* data   ||  contents: (K4>2Ø%I4)+(H4>25.ØØ)                                 *
*                edit:                                                       *
*                                                                            *
******************************************************************************
```

This will inform you the part in row 8, satisfies one of the conditions and the parts in rows 4,5,6,7,9,1Ø and 11 satisfy both of the conditions. Thus, you have the means to produce the result desired by your managers including the ability for them to scale how well the products are doing in relation to one another.

We will demonstrate one other example of how to scale the success of your parts using an alternative structure. In this case, we will assign a value of 1ØØ to those parts which satisfy both of the conditions of having the amount on order be more than 2Ø% of the amount stocked and the profit be greater than 25%. We will assign a value of 5Ø to any part which does not satisfy both of these conditions. To accomplish this task, move the cursor to O4 and enter '(H4>25)*(K4>2Ø%I4):1ØØ:5Ø'. Note that the '*' implies the use of the logical operator AND; but is, in this case, identical in result to the multiplication operation. If either expression is false it's numerical value becomes Ø and Ø multiplied by anything results in Ø. So, both expressions must be true for a part to be valued at 1ØØ. Otherwise it is valued at 5Ø. After you copy the formula with relative changes, your screen will show the following display



```
*******************************************************************************
* -Cursor Movement- |         -Commands-  ; followed by          | -Misc-   *
*  <CR> Right       |A Auto   F Format  M Merge  R Recalc * Extend |@ Curs Pos *
* ^S Left  ^D Right |C Copy   H Help    O Order  S Save   = Lock   |? Evaluate *
* ^E Up    ^X Down  |D Delete I Insert  P Print  W What   ? Space  |^ Data Togl*
* ^Z Col A next row |E Edge   L Load    Q Quit   G or <TAB> Goto   |<ESC>Cancel*
*Col>|M             |N              |O              |P              |          *
*Row+--------------------------------------------------------------------------*
*  1:                                                                          *
*  2:                                                                          *
*  3:                                                                          *
*  4:                        1.00>          50.00<                             *
*  5:                        1.00           50.00                              *
*  6:                        1.00           50.00                              *
*  7:                        1.00           50.00                              *
*  8:                        0.00           50.00                              *
*  9:                        1.00           50.00                              *
* 10:                        1.00           50.00                              *
*   +--------------------------------------------------------------------------*
*               cursor: O4          current: O4        L-R                      *
*                                                                              *
* current||        type: numeric                                               *
* data   ||    contents: (H4>25)*(K4>20%I4):100:50                             *
*                  edit:                                                       *
*                                                                              *
*******************************************************************************
```

One last reminder might be helpful at this point. When you are working with complex expressions it is important to keep in mind the order in which they will be evaluated. On a computer, all of the multiplication and division operations will be executed before any of the addition or subtraction operations. The only way to alter this order of evaluation is to use parentheses in the appropriate places. Any operation enclosed by parentheses will have a greater priority than those not enclosed in parentheses. Inside parentheses evaluation will follow the normal order of mutiplication and division and then addition and subtraction. Therefore, use your parentheses carefully in order for your expressions to yield the results you intend they should yield.

II.25 THE AUTOMATIC FORM COMMAND

The Auto command is utilized to make it more convenient to edit specific entries that are highly subject to change. The Auto command is used in conjunction with the form mode specification of the Format command.

The way it works is to move the cursor to an entry, set the form mode, move the cursor to another entry and set the form mode and so on until you have set the form mode for all the items of data in your file that are highly subject to change. Now, execute the Auto command and the cursor jumps to the first entry at which the form mode is set. The Auto command has automatically deleted the previous value in that entry and you may now put in your new information. When you hit RETURN the cursor jumps to the next entry in that row or to the first entry in the next row at which you set the form mode, deletes the previous value at the entry and you may enter your new information. The Auto command proceeds in a row by row order through the file, one entry at a time for each time RETURN is entered.

The purpose of the Auto command, as was stated, is to save you from having to hunt around the array looking for a specific piece of information. With the Auto command, you may automatically jump from entry to entry and make your editing work a lot easier.

In our EXAMPLE file, the two categories of data which are most subject to change are QUANTITY ON HAND and COST. We will demonstrate how much easier it is to edit using the Auto command.

First of all, Goto F4. Here are the steps necessary to set the form mode

computer prompt	your response	explanation
edit	;	access command directory
Command	F	access Format command
P)recision(Ø) or W)idth(24) or Form Mode(clear)	F	set form mode at current location

The message now displayed below the edit line reads

Form mode (set)

Repeat this procedure for locations F5 through F11 and J4 through J11. We will re-enter the information shortly.

Once all the form modes have been set for the values in columns F and J, move the cursor back to location A1. Now imagine that you have received updated information for the cost of the bolts and the present quantity on hand. Instead of moving the cursor all over, we may execute the following steps to input our new data

computer prompt	your response	explanation
edit	;	access command directory
Command	A	access Auto command

The cursor jumps to location F4, the entry where the first form mode was set. The entry is blank and waiting for a new cost value. Enter '.Ø15'. When you hit RETURN the entry is made and cursor jumps to location J4, the next form mode on row 4. At J4, enter '212Ø', our new data for the number of 1/4" bolts on hand. Once again, when you hit RETURN, the entry is made and the cursor jumps to location A5. You may continue to use the Auto command in this same way to enter the rest of the data

F5 - '.Ø21'	J5 - '29ØØ'
F6 - '.Ø29'	J6 - '378Ø'
F7 - '.Ø41'	J7 - '311Ø'
F8 - '.Ø58'	J8 - '4195'
F9 - '.Ø81'	J9 - '3Ø63'
F1Ø - '.113'	J1Ø - '1918'
F11 - '.158'	J11 - 'Ø'

After entering the last of the data, CalcStar will automatically recalculate all formulas in the array.

NOTE

> Remember, if you would like to abort the Auto command before you have finished entering information for all of the form mode locations, you may hit <ESC> and control will return to the edit line and the message below the edit line will read Auto aborted.

If you decide that you would like to switch some of the form modes from set to clear (back to their original condition) so that the Automatic form command will not jump to these locations, then follow these steps to undo the set form mode

computer prompt	your response	explanation
edit	;	access command directory
Command	F	access Format command
P)recision(2) or W)idth(1Ø) or Form Mode (set)	F	change form mode from set to clear

With the form mode clear, the Auto command will no longer jump to this location.

II.26 THE PRINT COMMAND (ENTIRE FILE)

At last we have come to the point where we are ready to print out the results of all your hard work on this example file. There is a lot of flexibility with the Print command and as a result there are several prompts involved before the printing takes place. This flexibility, however, allows you many possibilities in specifying what you may have on your printout. In order to fully demonstrate the flexibility of the Print operation, we will break it up into two different sections. This section will give an example of how to print out an entire file. Section II.27 will give an example of how to print out a subsection of a file.

To begin the Print operation, proceed through the following steps

computer prompt	your response	explanation
edit	;	access command directory
Command	P	access Print command
To which file ? PRINTER:	<CR>	see below

The last question above informs you that you may either print out your report to another file on the disk or to the printer for a hard copy. If you would like to print the report to a file on the disk, then enter the name that you would like the report to be stored under. Once the report is stored in a file on the disk you may use it in a word processing environment as we will describe in the next section. If you would like a printout, then enter RETURN and by default your report will be sent to the printer. For our EXAMPLE file, enter RETURN so you may have a printout of the report. The next prompt will ask

```
top left corner : Al
```

At this point, you may specify the location on the array (i.e. some coordinate) that you would like to become the top left-hand corner of your printout. The prompt is included in case you would like to print out only a portion of the report which did not include the upper left-hand corner of the array (i.e. location Al). We will demonstrate this in the second example (section II.27) of this manual. For now, we would like to print out the entire file, so enter RETURN or 'Al' as shown below

```
top left corner : Al
```

After entering 'Al' or hitting RETURN the next prompt will ask

```
bottom right corner : J11
```

Now you are being asked to specify what you would like to be the bottom right hand corner of your printout. At this point you have to be a little careful. If your report is wider than the maximum printing width of your printer, then you will need to have your report printed out in segments and patch it together afterward. The bottom right corner of the report is the default value. If this is not the point you would like to have for the bottom right of your report, then enter the correct location or move the cursor to the location and type the '@' symbol.

In our example we will assume the use of a printer with a printing width of 80 characters in order for our example to be universally applicable. Since our report is wider than 80 characters, we will be able to demonstrate how CalcStar automatically divides our report into segments to fit our printing width. In this first printing example we are printing out the entire report. In our EXAMPLE file move the cursor to L13 and type '@'. The result is shown below.

```
..............................................
.                                            .
. bottom right corner : L13                  .
.                                            .
..............................................
```

HINT

If you don't remember what the last row with relevant information is, then move the cursor around to enable you to find out and then use the '@' sign to enter the appropriate coordinate.

After hitting <RETURN>, the next prompt will be

```
..............................................
.                                            .
. Form length : CONTINUOUS                   .
.                                            .
..............................................
```

This prompt allows you to decide how many lines per page you would like printed. If you would like the printout to be continuous from page to page, then hit RETURN and the next prompt will be presented. If you would like less than 66 lines per page (standard type) printed, then enter your choice between 1 and 66. For our first printout, answer this prompt with '60' as illustrated below

```
..............................................
.                                            .
. Form length : 60                           .
.                                            .
..............................................
```

After you have specified the number of lines per page to be printed (provided you did not hit RETURN for continuous printing) the system will prompt

```
..............................................
.                                            .
.  Stop on each page (y,n) ?                 .
.                                            .
..............................................
```

If you decide you would like the printing to stop after each page is printed, then enter 'Y'. You will be able to resume the printing by hitting the <SPACE> key. If you decide that you don't need the printing to stop after each page, then enter 'N' and the system will print the specified number of lines per page until the entire section has been printed. For instance, we would like the printing to execute without stopping, so enter 'N' as shown below

```
..............................................
.                                            .
.  Stop on each page (y,n) ?  N              .
.                                            .
..............................................
```

Whether you decide that you would like continuous printing or you specify a printing length, the next prompt will ask

```
..............................................
.                                            .
.  Printer width : 132                       .
.                                            .
..............................................
```

Now, you may choose the number of spaces across the page you would like the file to be printed in. This will partially depend on the paper size and the type size. If you are using the 11" wide paper, you may specify the standard printing width of 132 spaces across the page by hitting <RETURN>. Otherwise, if you would like less than 132 spaces printed across the page, enter a number between 1 and 132. If you are using the 8-1/2" wide paper, then enter a number between 1 and 80 (the maximum number of spaces across for 8-1/2" wide paper).

One very important reminder is to make sure that the printing width you specify is wide enough to fit the portion of the array you would like to be printed out. For example, do not specify a printing width of 50 if you would like 80 spaces of data to be printed out.

In order to be universally applicable, we will specify a printing width of 80 for our printout of the file EXAMPLE, so enter '80' as illustrated below

```
..............................................
.                                            .
.  Printer width : 80                        .
.                                            .
..............................................
```

Once you have entered a figure for the printing width, the screen will be cleared before presenting the last few prompts. The reason for clearing the screen is to make the display clearer and more attractive in case you are printing your report to the console instead of the printer. Once the report is finished being displayed at the terminal screen, the CalcStar array will be redisplayed just as it was before executing the Print command.

If the report you are printing out is wider than the printing width specified above CalcStar will automatically divide your report into segments. The system will fit as many columns across the width of the paper that it can, given the printing width you entered, and then will jump down to the next page and print the next segment. This will make it very easy to paste together the segments of a wide report. It also saves you from having to execute the Print command several times. If the printing in segments is needed you will see the following message at this time

```
.................................................
.                                               .
.  Report Printing ..                           .
.  Make sure printer & paper are ready          .
.   Printing in segments                        .
.                                               .
.................................................
```

If you decide you do not want your report to be printed in segments and you would rather rearrange the array contents, you may type the <ESC> key to abort the Print operation and return to the Edit line.

The prompt shown below will be displayed if you are printing out a subsection of the report that will not include the first column or the first row.

```
..............................................
.                                            .
.  Fix ordinates (y,n) ?                     .
.                                            .
..............................................
```

A 'Y' response will print the report with the headings that would otherwise be missing if you are printing out a subsection of the report array that will not include the column headings (e.g. 'PART #) or the row headings. An example of how to use the fixed ordinates prompt will be demonstrated in the second printout example in section II.27 of this manual.

The next prompt will be

```
..............................................
.                                            .
.  title>                                    .
.                                            .
..............................................
```

If you would like your report to have a title, you may now enter the first line of the title. Once you have entered the first line of the title and hit <RETURN>, the prompt for title will repeat itself so that you may include a second line to your title. In fact, you will be able to enter as many lines to your title as you wish. When you are finished with the title, hit only the <RETURN> key to answer the title prompt. This will tell the system you are finished with the title. Your title will be automatically centered at the top of your report.

If you would prefer not to have a title on your report, enter <RETURN> to the first title prompt.

For our first printout, let's give our file a two line title. For the first line of the title, enter 'EXAMPLE INVENTORY FILE' as shown below

```
.............................................
.                                           .
. Title> EXAMPLE INVENTORY FILE             .
.                                           .
.............................................
```

After the above entry is made, the prompt for title will be repeated so that we may enter the second line of our title. For the second line of our title, enter 'PRINTOUT #1' as illustrated below

```
.............................................
.                                           .
. Title> PRINTOUT #1                        .
.                                           .
.............................................
```

The third time the title prompt is displayed, you may hit <RETURN> and the report will begin printing. To abort the Print operation hit <ESC>.

If you specified earlier that you would like the printing to stop after each page is printed, you will need to hit <SPACE> in order for the next page to be printed. This will continue until the printing is finished.

After the printing is finished, control will return to the edit line. You will now have a complete printout of your inventory report.

II.27 THE PRINT COMMAND (PARTIAL FILE)

In this section we would like to demonstrate how to print out a subsection of the file. For example, imagine you were asked to produce a printout that contained only the part names, supplier number and supplier name for the 5/8", 3/4", and 7/8" bolts. If CalcStar did not allow you so much flexibility with the Print command, then we would either have to cut up a printout that contained all the information for all the bolts or write a new report. However, with CalcStar, we may printout any subsection of the file.

To begin, access the Print command as we did before. The steps are

computer prompt	your response	explanation
edit	;	access command directory
Command	P	access Print command
To which file ? PRINTER:	<CR>	send report to printer

One possibility which can be very useful is to print a subsection of the report to a file on the disk where it is stored in ASCII code and is therefore available for use with WordStar. For instance, if you would like to use part of the report in a letter, then write that section to a file and it may then be included as an insert file in another printing program. For now, we will generate a standard printout.

The prompt that will now be displayed is shown below

```
..............................................
.                                            .
.  top left corner : A1                      .
.                                            .
..............................................
```

In this example, we wish to print out only the information for three bolts beginning with the part name - we are not interested in the part number which is the upper left corner of the file. So, instead of typing <RETURN>, we should enter 'B7'. This will insure that rows 1 through 6 and column A are excluded from the printout. Your response for this prompt is shown below

```
..............................................
.                                            .
.  top left corner : B7                      .
.                                            .
..............................................
```

The next prompt will ask

```
..............................................
.                                            .
.  bottom right corner : L13                 .
.                                            .
..............................................
```

In this printout, we are only interested in the information contained in the columns for part name, supplier number and supplier name for the three bolts mentioned, so column D would be the last column. The 7/8" bolt is the last one we want included, so the last row is row 9. Consequently, the bottom right corner of this printout should be D9. 'L13' is the current cursor location, so it is the default value for this prompt. To override the default, enter 'D9' as illustrated below

```
.............................................
.                                           .
.  bottom right corner : D9                 .
.                                           .
.............................................
```

The next prompt to be displayed is

```
.............................................
.                                           .
. Form length : CONTINUOUS                  .
.                                           .
.............................................
```

We are only printing a small portion of the array, so we really do not need to be concerned too much with this prompt since the printout will not be more than one page. As a result, hit the RETURN key to observe how nothing is entered on the prompt line, but the prompt is replaced by the next prompt. This means the system answered the prompt by default. In other words, by not entering anything before the RETURN key is hit, the system interprets your response to mean you would like the printing to be continuous from page to page. The next prompt will ask

```
.............................................
.                                           .
.  Printer width : 132                      .
.                                           .
.............................................
```

As in the previous example in section II.26, we will specify the printer width to be 8Ø to insure there will not be any trouble with any print size or paper size and you will get your desired printout. Enter '8Ø' as shown below

```
.............................................
.                                           .
.  Printer width : 8Ø                       .
.                                           .
.............................................
```

As mentioned in the previous section, after the above prompt is answered the screen will be cleared of its present display and will then present the last few prompts. The screen is cleared so that in case the report is being sent to the console, it will be easier to view the report than if the CalcStar array was not first cleared.

If the subsection of the report you are printing out is larger than the printing width entered above, the portion of the report you are printing will be divided into segments and you will see the same message as shown in the previous section on printing an entire report. Since the subsection of the report we are printing is smaller than the printing width we will see the following prompt instead

```
.............................................
.                                           .
.  Fix ordinates (y,n) ?                    .
.                                           .
.............................................
```

This prompt is asking you whether you would like to include the column and row headings on your printout. This would be helpful to us in this example since we are only printing out a subsection of the file. Otherwise, we will not necessarily know what some of the numbers and text pertain to. If we were to answer 'N' to this prompt and thereby not include the column and row headings, our printout would appear like the following

```
------------------------------------------------------------
-                                                          -
-                                                          -
-         5/8" BOLT         83          UNIVERSAL          -
-         3/4" BOLT         83          UNIVERSAL          -
-         7/8" BOLT         83          UNIVERSAL          -
-                                                          -
------------------------------------------------------------
```

If we decide to include the ordinates by entering 'Y' to the prompt above, the printout will resemble the following

```
------------------------------------------------------------
-                                                          -
-                                                          -
-          PART NAME    SUPPLIER #    SUPPLIER NAME        -
-                                                          -
-          5/8" BOLT           83       UNIVERSAL          -
-          3/4" BOLT           83       UNIVERSAL          -
-          7/8" BOLT           83       UNIVERSAL          -
-                                                          -
------------------------------------------------------------
```

There are no row headings in our EXAMPLE file, but the column headings are included as shown.

In order to give our printout clarity, enter 'Y' so that the headings are included. Your response will appear as shown below

```
.............................................
.                                           .
.  Fix coordinates (y,n) ? yes              .
.                                           .
.............................................
```

After the above prompt is answered, the next prompt will say

```
Title>
```

We may include as many lines to our title as we wish. To answer this prompt we should enter in what we would like to be on the first title line. When we hit RETURN, the prompt will repeat and we may then enter in what we would like for the second line of the title. So, each time the prompt appears, it will be another line of title. When you have as many lines of title as you wish, answer the prompt by only hitting the <RETURN> key. For our first title line, enter 'EXAMPLE INVENTORY FILE SUBSECTION' as shown below and then hit <RETURN>. The title line will print immediately.

```
Title> EXAMPLE INVENTORY FILE SUBSECTION
```

For the second title line, enter 'PRINTOUT #2' and then hit <RETURN>

```
Title> PRINTOUT #2
```

The next time the title prompt is repeated, do not enter anything before hitting <RETURN>. The report will begin printing.

After the printing is completed, the next promt displayed is

```
.. End of report
Hit space to continue
```

After hitting <SPACE>, control will be returned to the edit line.

You should now have your second printout and hopefully feel comfortable in knowing how to use the Print command to your best advantage.

II.28 THE /PAGE FUNCTION

There is another function which can be used in conjunction with the Print command. The /Page function serves as a form feed instruction to the system during the Print operation. When the system encounters the row with the '/Page' entry, the printing will skip the rest of the present page and will resume printing on the top of the next page. To be effective the /Page entry must be located in the leftmost column printed.

For example, if you would like to print the first four columns from our EXAMPLE file, but, you would like to have rows 1 through 6 on one page and rows 7 through 13 on another page, then you could insert a row at row 7 and enter '/page' at A7. Now specify your bottom right corner as D14 and proceed through the rest of the Print command as before. The resultant printout will show columns 1 through 6 on the first page and rows 8 through 14 on the second page.

II.29 LINEAR REGRESSION (FORECASTING)

If you could choose what you would like most in a financial report modeling system, what would it be? Most likely it would be the ability to tell the future. After all, one of the most important goals of a financial report writing system is to give the best advice it can, based on past data. Well, MicroPro has taken this goal to heart and CalcStar incorporates the ability to compute a linear regression which computes the best estimator of a predicted value based on a given value or computes the best estimator of the necessary given value by entering a hypothetical predicted value. For example, you may enter values for the amount of sales for six periods and the amount of money spent on advertising for the same period. Now, by using the regression command, you can compute a linear equation which will best fit the data entered. Using this equation, you may then enter a given amount of advertising money and the system will compute the best predicted value for the amount of sales you will have in that month based on the past correlation of advertising expense and amount of sales. You will also be able to enter in the amount of sales you want and compute the best estimator of the amount of money you will need to spend in advertising to reach that sales level based on the past data entered.

As you can imagine, this feature will open all kinds of forecasting possibilities. The linear regression is much more efficient than a simple growth assumption. Everyone interested in a financial modeling system will be able to benefit from this feature.

In order to demonstrate the regression feature we will leave our inventory example behind us and create a new example. One useful application would be the situation mentioned above. We may enter data for money spent on advertising, dollar amounts of sales, and some of the months of the year to illustrate how to best forecast future trends based on a linear regression of past data.

To begin, insure yourself that your EXAMPLE file is saved and then type the following in order to clear the CalcStar array.

computer prompt	your response	explanation
edit	;	access command directory
Command	D	access Delete command
Delete: A)ll R)ow C)olumn E)ntry	A	delete contents of entire array
verify Y/N -	Y	after making sure you have saved your work, enter 'Y' for complete deletion. If you have not saved your work and want to preserve it, enter 'N'

Now the contents of the CalcStar array will be erased and you may begin to work on a new project. We may begin our new example by entering text and numeric data for the first six months of 1982. For simplicity, we will present diagrams illustrating what your screen should resemble after entering the appropriate data. This will be a good time to review all the commands you have learned up to this point. Shown below is a replication of your screen with location Al as the upper left hand corner.

```
******************************************************************************
* -Cursor Movement- |          -Commands-  ; followed by             | -Misc-    *
*  <CR> Right       |A Auto   F Format  M Merge  R Recalc * Extend |@ Curs Pos *
* ^S Left  ^D Right |C Copy   H Help    O Order  S Save   = Lock   |? Evaluate *
* ^E Up    ^X Down  |D Delete I Insert  P Print  W What   ? Space  |^ Data Togl*
* ^Z Col A next row |E Edge   L Load    Q Quit   G or <TAB> Goto   |<ESC>Cancel*
*Col>|A                     |B          |C         |D         |E        |          *
*Row+--------------------------------------------------------------------------*
*  1:>                      <       JAN        FEB        MAR     APRIL        *
*  2:                                 1          2          3         4        *
*  3:                         ========== ========= ========= =========         *
*  4:district A                                                                *
*  5:     product 1                 3ØØ        435        65Ø       875        *
*  6:     product 2                 1ØØ         92         81        64        *
*  7:                                                                          *
*  8:advertising $$                123Ø       13ØØ       1435      145Ø        *
*  9:                                                                          *
* 1Ø:                                                                          *
*   +--------------------------------------------------------------------------*
*             cursor: Al          current: Al        L-R                       *
*                                                                              *
* current||       type:                                                        *
* data   ||   contents:                                                        *
*                 edit:                                                        *
*                                                                              *
******************************************************************************
```

If you move the cursor so that location F1 is the upper left hand corner, you may enter the following data and your screen will appear as shown below.

```
*****************************************************************************
* -Cursor Movement- |         -Commands-  ; followed by             | -Misc-   *
*  <CR> Right       |A Auto   F Format  M Merge  R Recalc * Extend |@ Curs Pos *
* ^S Left  ^D Right |C Copy   H Help    O Order  S Save   = Lock   |? Evaluate *
* ^E Up    ^X Down  |D Delete I Insert  P Print  W What   ? Space  |^ Data Togl*
* ^Z Col A next row |E Edge   L Load    Q Quit   G or <TAB> Goto   |<ESC>Cancel*
*Col>|F          |G          |H          |I          |                          *
*Row+------------------------------------------------------------------------*
*  1:>       MAY<       JUNE                                                 *
*  2:          5           6                                                 *
*  3: ========== ===========                                                 *
*  4:                                                                        *
*  5:       12ØØ        144Ø                                                 *
*  6:         55          47                                                 *
*  7:                                                                        *
*  8:       151Ø        153Ø                                                 *
*  9:                                                                        *
* 1Ø:                                                                        *
*   +------------------------------------------------------------------------*
*              cursor: F1         current: F1       L-R                      *
*                                                                            *
* current||        type: text: right justified                               *
* data   ||    contents: 'MAY'                                               *
*                  edit:                                                     *
*                                                                            *
*****************************************************************************
```

Now we have a potential situation with which to work. With the information given we may now use the regression function to compute a linear equation which may then be used to compute the best linear estimators of values we wish to forecast. The regression function allows you to enter one range of entry locations, followed by a comma, followed by the first coordinate of the second range of entries. The number of entries within each range must be the same and that is why you only need to enter the first coordinate of the second range. The values contained within the first range of entries are the values for your independent variable. Independent variable is a statistical term which basically means that the value of the variable is determined independently from the values of other variables. In contrast, the second range of entries contain the values for your dependent variable. The dependent variable is the one which you are assuming is influenced by other factors besides itself. To clarify all this, in one of the examples in this section we will assume the amount of sales to be dependent on the amount of money spent on advertising. In this case, the money spent on advertising will be our independent variable and the amount of sales will be our dependent variable. Most likely, in the real world, sales will not be completely determined by the amount of advertising we do, but we can get a pretty good idea of how sales have correlated with advertising expense.

For our SALES example file we will enter the regression function in three different places in order to demonstrate some slightly different points. First of all, at location H5 enter

'+regr(B2>G2,B5)'.

The plus sign insures the entry is interpreted as numeric. The 'regr' signifies the regression function. 'B2>G2' is the range of entries which contain the values for the independent variable. 'B5' is the beginning of the range of entries which contain the values for the dependent variable. The system will automatically know to include the entries through G5 since that will result in the same number of entries as the range for the independent variable. So, in this first equation we are regressing the amount of sales on the time periods (months). This will allow us to see how sales are doing as time passes by and then we will be able to come up with a forecast for sales in any future time period based on the trend established with this data. A numerical value will be displayed at location H5 where you entered the regression function. We will explain this value in a minute.

With one regression function entered and with location F1 as the upper left hand corner, your screen will simulate the following illustration

```
********************************************************************************
* -Cursor Movement- |         -Commands-  ; followed by            | -Misc-    *
*  <CR> Right       |A Auto   F Format  M Merge  R Recalc * Extend |@ Curs Pos *
* ^S Left  ^D Right |C Copy   H Help    O Order  S Save   = Lock   |? Evaluate *
* ^E Up    ^X Down  |D Delete I Insert  P Print  W What   ? Space  |^ Data Togl*
* ^Z Col A next row |E Edge   L Load    Q Quit   G or <TAB> Goto   |<ESC>Cancel*
*Col>|F         |G          |H          |I          |                          *
*Row+--------------------------------------------------------------------------*
*  1:>       MAY<       JUNE                                                   *
*  2:          5          6                                                    *
*  3: ========== ==========                                                    *
*  4:                                                                          *
*  5:       12ØØ       144Ø     816.66                                         *
*  6:         55         47                                                    *
*  7:                                                                          *
*  8:       151Ø       153Ø                                                    *
*  9:                                                                          *
* 1Ø:                                                                          *
*    +-------------------------------------------------------------------------*
*              cursor: F1           current: F1        L-R                     *
*                                                                              *
* current||        type: text: right justified                                 *
* data   ||    contents: 'MAY'                                                 *
*                  edit:                                                       *
*                                                                              *
********************************************************************************
```

The numerical value you see represents the mean or average value for the range of dependent values given in the regression function. Sometimes, this value may be useful to you to know for other calculations, so the regression function returns this value. If you do not think you have any need for this value, there is a simple way to keep the regression function but have it return a blank value into the array. For instance, move the cursor to location H5 and enter

```
+regr(B2>G2,B5):'':''
```

The outer quotation marks showing what to enter have been omitted to avoid confusion. This expression will return a blank value in any event. You may go ahead and enter this formula as we will not need to use the mean of the dependent range so we might as well leave the screen as uncluttered as possible.

The regression function, which computes a linear equation from the two ranges you have entered, is the first of two steps to forecasting with CalcStar. Once you have used the regression function, you have a choice of three other functions to use in conjunction with the regression function. These three functions include the following:

1. proj - allows you to enter a value for an independent variable and then the best estimate for the dependent variable will be calculated and entered into the current cursor location.

2. depd - allows you to enter a value for the dependent variable and then the best estimate for the independent variable is calculated and entered into the current cursor location.

3. slope - allows you to have the system enter the slope of the linear equation computed from the regression function, into the current cursor location. The slope gives you a rough estimate of the correlation between the independent variable and the dependent variable. If the slope is 3Ø it means that for a change of 1 in the independent variable, you will get a change 3Ø times that size in the dependent variable. If the slope is -2Ø, it means that for an increase of 1 in the independent variable, you will get a decrease of 2Ø in the dependent variable. As an example, this information can tell you if, as advertising expenses increase, there is a simultaneous increase or decrease in sales and how large the change is.

NOTE

This type of regression does not pretend to determine cause and effect, but only tells you what kind of correlation there is.

We shall demonstrate all three of these functions within this section.

Let us say we would like to estimate how much sales for product 1 will be in October given the data for the first six months of this year. To calculate our best estimate, move the cursor to location I5 and enter '+proj(1Ø)'. We know from our regression function that the month number is the independent variable and the sales amount is the dependent variable. With the project function, we enter a known amount for the independent variable and the system returns the best estimate for the dependent variable. In this case, the system returned the amount of '2343.23'. This informs us that based on the first six months of this year, we can expect to have sales of $2343.23 in October of this year for product 1.

At location H6, enter '+regr(B2>G2,B6)'. This is very similar to what you entered in the first example. The reason why we have included the regression for this location also is to contrast results with the first example. In example #1 there is a positive relationship between sales and time. That means, as time is increasing, sales are also increasing. In example #2, however, as time is increasing, the data shows sales to be decreasing. This will show how regression can be used for both positive and negative trends.

Once your regression function has been entered, move the cursor to location I6 and type '+proj(1Ø)'. The result of '.18' tells us that, by October, sales will have declined so much on this product as to be next to nothing. If we were to enter '11' or '12' the amount would be below zero informing us that we were building up unwanted inventory.

For the last example, go to location H8 and type '+regr(B8>G8,B5)'. This example is the one we mentioned above where amount of money spent on advertising is the independent variable and sales of the first product is the dependent variable. Note that this regression function has the same mean for the dependent range as the first example. This is because it has the same range of entries for the dependent variable. You may enter the equation to return a blank entry with the regression function, if you would like.

This time we will demonstrate the dependent function. Move the cursor to location I8 and type '+depd(2ØØØ)'. This is asking for the best estimate of the amount of money you need to spend on advertising to result in a sales amount of $2ØØØ. If you were to enter +proj(2ØØØ), that would be asking for the amount of sales WITH advertising expenses of $2ØØØ. See the difference? You are telling the system, "I want a sales level of $2,ØØØ. How much money will I need to spend on advertising in order to reach that level, based on the data for the first six months of this year?"

The result shown on the screen indicates that we will need to spend $175Ø.88 on advertising to reach a sales level of $2,ØØØ for product 1. Just to prove to yourself that these are not random numbers, now type '+proj(175Ø.88)'. This is proposing the reverse. If we spend $175Ø.88 on advertising, what will the best estimate of sales be? The result is $1999.98, close to $2ØØØ which is, of course, what the sales level should be, given our first prediction. See what fun things you can do?

The last function to demonstrate is the slope function. Move the cursor to location J5 and enter '+slope()'. Now go to location J6 and enter the same thing and repeat this procedure at location J8. In all three entries the result will be '3.46'. If you doubt that this is really the case, then you are absolutely right. CalcStar has been set up so all of the functions which work with the regression function work with the last regression function entered in time sequence. Since the regression function at location H8 was the last one we entered, the system thinks we are asking for the slope of that regression equation three times (I5, I6, and I8). This brings up a very important point. If you want to enter a function to be used with a regression function that was not the last regression function entered, then execute the recalculate command (';R', 'A') afterward in order to get the correct result. For instance, since we want the slope for all three of the regression functions, we should execute the recalculate command to insure they are evaluated properly.

Once the recalculate command has been executed, and labels for the month of October have been entered, your screen will resemble the diagram below if location G1 is the upper left hand corner.

```
********************************************************************************
* -Cursor Movement- |          -Commands-  ; followed by             | -Misc-    *
*  <CR> Right       |A Auto    F Format  M Merge  R Recalc * Extend |@ Curs Pos *
* ^S Left  ^D Right |C Copy    H Help    O Order  S Save   = Lock   |? Evaluate *
* ^E Up    ^X Down  |D Delete  I Insert  P Print  W What   ? Space  |^ Data Togl*
* ^Z Col A next row |E Edge    L Load    Q Quit   G or <TAB> Goto   |<ESC>Cancel*
*Col>|G          |H          |I          |J          |K                         *
*Row+-------------------------------------------------------------------------- *
* 1:>      JUNE<                   OCT                                         *
* 2:           6                    10                                         *
* 3: ==========             ==========                                         *
* 4:                                                                           *
* 5:        1440               2343.23      234.85                             *
* 6:          47      73.16        .18      -11.22                             *
* 7:                                                                           *
* 8:        1530     816.66    1999.98        3.46                             *
* 9:                                                                           *
* 10:                                                                          *
*   +--------------------------------------------------------------------------*
*              cursor: G1         current: G1       L-R                        *
*                                                                              *
* current||      type: text: right justified                                   *
* data   ||  contents: 'JUNE'                                                  *
*                edit:                                                         *
*                                                                              *
********************************************************************************
```

Note the mean for the dependent range for the first regression function we entered has been replaced by the blank entry, yet we may still use the regression function stored at that entry. Now we have the slopes for the three regression functions we entered and you can get a rough estimate of the correlation between the values regressed against each other. For example, the second regression function results in a slope of -11.22. This informs us that sales are decreasing about 11 units on the average as each month passes by.

A good rule of thumb is to execute a recalculate command for each time you use a project, dependent, or slope function unless you enter the regression function to be used with it immediately previous to entering the project, dependent, or slope function. Another very important rule to remember to insure correctness is to have your slope, dependent, and/or project function after the regression function which it uses but before the next regression function. By "after" we mean to the right of it if it is on the same line or on a line below the regression function otherwise. By "before the next regression function" we mean to the left of it if it is on the same line and on a line above the regression function otherwise. This is because the recalculate command proceeds in a left to right order from the top to the bottom of the array. By having your project, dependent, and slope function after the regression function but before the next one you insure that it is evaluated according to the proper regression function. The best advice is to locate your slope, dependent, and/or project functions in the locations immediately to the right of the regression function. This only makes sense anyway since the regression function will almost always be used in conjunction with one or more of the other three functions.

In our discussion of our SALES example, we have ignored one possible complication. For some businesses, seasonal effects pose a problem to linear regression. In a case like this, rather than perform a regression on all the months of one year, you could use the data for the same month over the last few years and perform a regression on this data.

We hope the linear regression capability of CalcStar will prove to be extremely useful to you. Linear regression can be a very valuable tool in assisting you to recognize trends based on past data and thus helping you to make some educated guesses about the future. Linear regression does not prove a cause and effect relationship, but it does give an indication of how changes in one area will correlate with changes in another area and this in itself may be enough. Used as an aid, regression will help you in any type of forecasting you would like to perform.

II.3Ø THE LOAD COMMAND

The Load command is utilized to reload files into the CalcStar main menu. To demonstrate the Load command, we will first clear the screen of our SALES file and then reload EXAMPLE back into the CalcStar array. Make sure you have saved SALES and then follow these steps to clear the screen

computer prompt	your response	explanation
edit	;	access command directory
command	D	access Delete command
Delete: A)ll R)ow C)olumn R)ow	A	clear the screen
verify Y/N -	Y	insures this is ok with you

To execute the Load command and regain access to our EXAMPLE file, duplicate the following steps.

computer prompt	your response	explanation
edit	;	access command directory
Command	L	access Load command
Filename: (make sure file is saved)	EXAMPLE<CR>	reload file named EXAMPLE
Load position : A1	<CR>	load EXAMPLE into the array with the upper left hand corner of the report at location A1

The result will be that our file is loaded into CalcStar and appears exactly as it did before we deleted it from the screen.

The message, "(make sure file is saved)", is to remind you that the existing format of the file displayed will disappear once another file is loaded, unless the existing format is saved.

The last prompt asking the load position grants us the option of loading the file into the CalcStar array with the upper left hand corner at any position we would like - providing there is enough room. The "A1" following the prompt does not mean that location A1 is the only place we can load in the report. Instead, it lets us know that the default loading position is location A1. So, if we would like the upper left hand corner of the report to be positioned at A1, then hit <RETURN>. If we would like to load the report at another location, enter the coordinate for the location or move the cursor to the location you would like to have as the upper left hand corner and type the '@' symbol. For example, type ';L' to access the Load command again and then type 'EXAMPLE'; but, this time, enter 'B3' as the load position. Your screen will now resemble the following

```
********************************************************************************
* -Cursor Movement- |          -Commands-  ; followed by              | -Misc-   *
*  <CR> Right       |A Auto    F Format  M Merge  R Recalc * Extend |@ Curs Pos *
* ^S Left  ^D Right |C Copy    H Help    O Order  S Save   = Lock   |? Evaluate *
* ^E Up    ^X Down  |D Delete  I Insert  P Print  W What   ? Space  |^ Data Togl*
* ^Z Col A next row |E Edge    L Load    Q Quit   G or <TAB> Goto   |<ESC>Cancel*
*Col>|A            |B            |C            |D            |                  *
*Row+---------------------------------------------------------------------------*
*  1:                                                                           *
*  2:                                                                           *
*  3:          >      PART #<   PART NAME   SUPPLIER #                          *
*  4:            ----------- ----------- -----------                            *
*  5:                                                                           *
*  6:                  12345    1/4" BOLT           35                          *
*  7:                  12346    3/8" BOLT           35                          *
*  8:                  12347    1/2" BOLT           35                          *
*  9:                  12348    5/8" BOLT           83                          *
* 10:                  12349    3/4" BOLT           83                          *
*   +---------------------------------------------------------------------------*
*  [   EXAMPLE] cursor: B3          current: B3        L-R                      *
*                                                                               *
* current||       type: text: right justified                                   *
* data   ||   contents: 'PART #'                                                *
*                 edit:                                                         *
*                                                                               *
********************************************************************************
```

This ability to alter the load position can be very useful, especially in conjunction with the Merge command. It now becomes possible to construct reports and models in modules and then mix and match them on the screen to put together all kinds of useful variations. For instance, you could construct a check writing module in one file and a payroll file in another module and then combine the two to make payday a lot less work.

One point to keep in mind is that the file that you are Merging onto the CalcStar array will override the existing file if entries in both files have the same coordinate address. So, once again, we recommend that you save the file before merging on a new file, if you have made any changes since loading it into the CalcStar array.

II.31 THE EXTENDED SCREEN COMMAND

At times, you will probably find that it would be very convenient if you could get a look at the entire array. However, we are limited by the size of the screen on your computer. Most screens will display 22 lines and either 40 or 80 columns. We have attempted to maximize the space by giving you all the information on the screen you will need and, at the same time, allowing you to see a fairly large portion of the array. We have included an option which will allow you to change the screen display according to your needs.

The extended screen command allows you to switch to an alternate screen mask which will display 15 rows of the CalcStar array rather than the standard 1Ø. When the extended screen command is implemented, the top section of the screen which lists the commands is replaced and the array is extended to 15 rows.

If our screen has the same display it did in the previous diagram, then we can now execute the extended screen command to show you what the new result would be. Here are the steps for executing the extended screen command.

computer prompt	your response	explanation
edit	;	access command directory
Command	*	access extended screen command

Your screen will now simulate the following diagram.

```
********************************************************************************
*                                                                              *
*                                                                              *
*Col>|A          |B          |C            |D            |                     *
*Row+--------------------------------------------------------------------------*
*  1:>          <                                                              *
*  2:                                                                          *
*  3:                  PART #     PART NAME    SUPPLIER #                      *
*  4:            ----------- ----------- -----------                           *
*  5:                                                                          *
*  6:                   12345   1/4" BOLT           35                         *
*  7:                   12346   3/8" BOLT           35                         *
*  8:                   12347   1/2" BOLT           35                         *
*  9:                   12348   5/8" BOLT           83                         *
* 1Ø:                   12349   3/4" BOLT           83                         *
* 11:                   1235Ø   7/8" BOLT           83                         *
* 12:                   12351     1" BOLT           83                         *
* 13:                   12353 1 1/4" BOLT           35                         *
* 14:                                                                          *
* 15:                                                                          *
*   +--------------------------------------------------------------------------*
*  [   EXAMPLE] cursor: A1        current: A1      L-R                         *
*                                                                              *
* current||      type:                                                         *
* data   ||  contents:                                                         *
*                edit:                                                         *
*    CalcStar (c) 1981 c/o MicroPro Int'l CS9999xx rv_AØ1 [LSI ADM-3A]         *
********************************************************************************
```

As a result of the extended screen command, you will be able to view five more rows of the CalcStar array. This will prove to be very convenient at times instead of being forced to move the cursor to change the screen display to another section of the array. Anytime you would like to return to the standard display to reference the command list or for whatever reason, type the same ';*' command and the usual 1Ø row display will return.

II.32 THE QUIT COMMAND

There are still a few commands which we have not demonstrated. The Quit and Help commands may be utilized at any time you are working on CalcStar and so we have included them at the end of the Operations section for easy reference.

The Quit command is used for quitting the CalcStar program and returning to CP/M. When you are finished working with CalcStar, then save your file if you would like to have a record of it for later use. After the file is saved, you may execute the following steps to quit the program.

computer prompt	your response	explanation
edit	;	access command directory
Command	Q	access Quit command
verify Y/N -	'Y' or 'N'	see below

If you enter 'N' to the prompt to verify quitting the CalcStar program, the Quit command will be aborted and control will be returned to the CalcStar edit line. If you answer 'Y' to the above prompt, CalcStar will terminate operations and the CP/M prompt will be displayed.

II.33 THE HELP COMMAND

The Help command serves as a very convenient and useful directory to the functions of the various operations available with CalcStar. There is also a lot of useful information and reminders in case you have any trouble entering different data values.

The Help command is more convenient to use than this manual in case you just need a quick reminder about a certain point, but if you need more than a quick reminder, this manual will probably help refresh your memory.

To execute the Help command, follow these steps

computer prompt	your response	explanation
edit	;	access command directory
Command	H	access Help command

After the preceeding steps are executed, the following screen display will occur

```
*****************************************************************************
*       ---- Help page 1 ----    hit <RETURN> to continue                  *
*_____________Main entry mode_______________________________________        *
* Cursor is controlled with keys E, D, X, and S with the <CTRL> key held down. *
*   Direction is up, right, down, and left in that order.  (Control Diamond)  *
*   <RETURN> moves the cursor right if no data has just been typed.          *
*   <CTRL> Z moves the cursor to the next row, first column.                 *
*                                                                            *
* Data Entry: digits Ø-9, +,. - signal numeric entry.                        *
*             alphabetic characters or blank signal text entry.              *
*             /, followed by R, C, or L justifies text right, centered, or left*
*             ^ is used to switch between text and numeric if needed.        *
*             /= duplicates entry across column. /P causes page break for print*
*             ! sets special entry mode for arithmetic modification of input. *
*                                                                            *
* Equations may contain numeric data, cell references, and functions.       *
*             four-function arithmetic (+,-,*,/) may be used with any of these.*
*             @ refers to current cell location.  Type one character and then *
*                 move cursor to put in cell references without typing them.  *
*             ! following a cell reference holds it constant in relative copy *
*             functions include: sum, avg, cnt, abs, exp, log, ln, min, max,  *
*                 sqrt, regr, slope, proj, depd.                              *
*                                                                            *
*                                                                            *
*****************************************************************************
```

After the first page of the Help directory you will need to hit the <RETURN> key in order to present the following page.

```
*****************************************************************************
*                                                                           *
*      ---- Help page 2 ----    Hit <RETURN> to continue                    *
*_______________Extended commands__________________________________         *
*                                                                           *
*  these commands are accessed by hitting the ';' key                       *
*     Auto        enter Automatic entry mode.  <ESC> will abort.            *
*     Copy        Copy a (range) entry to another (range) entry             *
*     Delete      Delete a row, column, entry or the whole array            *
*     Edge        set the window top left corner to the cursor position     *
*     Format      change column size or precision under cursor              *
*     Goto        move cursor to a specific column and row                  *
*     Help        display this information                                  *
*     Insert      Insert a row or column into the array                     *
*     Load        Load a file into the array                                *
*     Merge       overlay file onto array                                   *
*     Order       Change the evaluation (column/row) order of the array     *
*     Print       Print a report                                            *
*     Quit        exit the report generator                                 *
*     Recalculate recompute entry at cursor or whole array in current order *
*     Save        Save the array to a file                                  *
*     What        if text, prints 1st column & row entries of cursor position *
*     ?           print approximate storage space in terms of entries       *
*     =           lock column A and row 1 onto display                      *
*     *           Switch between 1Ø (with menu) and 15 row screen display   *
*                                                                           *
*****************************************************************************
```

After you hit the <RETURN> key for the last page of the Help directory, the Help directory will be replaced by the main menu just as you left it and control will be returned to the edit line.

II.34 EVALUATION OF INPUT DATA:

CalcStar has the capability of recomputing an input value before it is stored in the tableau. For example, suppose you wanted to enter the data for a previous period, adjusted for inflation. That is, you want to enter the data for last year with the addition of a 1Ø% adjustment for inflation. To accomplish this, you would type

```
!11Ø%!
```

after positioning the cursor over the cell you wished to have so augmented. The indeterminate value !n! will appear in that cell, and it will remain there until you have entered a number. For instance, if you enter 2ØØ, the calculated value 22Ø will replace the !n! in that cell.

Normally, you would want to treat entire rows or columns in this fashion, and the Copy command can be used to propagate the formula to the desired cells. It is best to copy the formula before you enter any data in the table, since the Copy will otherwise copy the value as well as the formula. However, as before, the formula will apply only to the cell with which it is associated.

Use of the Recalculate command will not affect these entries. The function only applies when the data is entered initially.

II.35 PROGRAM CSDUMP

With CalcStar we have included a separate, but very helpful secondary program called "CSDUMP". This support program allows you to print out a listing of the contents of the CalcStar array. That means you may have a printed copy of all the formulas and specifications that are behind the scenes to create your nice report which only includes calculated results. CSDUMP prints out each coordinate that has a data entry and informs you of the column width, type of entry (including justification if the entry is text) and the contents of the entry.

The importance of CSDUMP is the ability to print out the contents of the report in order to be able to store it in a safe place. In the case of a disk being ruined or lost or someone removing your report file, you still have a copy of your hard work.

Let's take a minute to demonstrate the use of CSDUMP so you will know how to obtain permanent copies of your report contents. To begin, you must exit the CalcStar program (use the Quit command, but make sure you save your file first - if you have not done so). For our example, we will use a file we have been working with before. You will have to know the name of this file, which will be the name you specified when you wrote the table onto a disk using the Save command. If you enter the name of a file which does not exist or an incorrect name, the system will tell you the file was not found and will give you another chance to enter a file name. For our demonstration we will print out the contents of the file BALSHEET which we introduced in section II.3.

From the CP/M prompt, type

```
    CSDUMP BALSHEET <RETURN>
```

You will then see the following display

```
********************************************************************************
*                                                                              *
*   CalcStar Dump vr 1.Ø                                                       *
*   CalcStar file name (<Return> to quit): BALSHEET.CSD,                       *
*   Comments?                                                                  *
*                                                                              *
********************************************************************************
```

If you did not enter the file name on the CP/M command line, the program will wait for you to enter it on the second line above. If you can't remember the file name, hit <RETURN>. This will return you to CP/M, from which you can search directories of your disks to find the name of the desired file.

If you would like to include a one line title to the printout, enter it to answer the prompt "Comments?". If you do not need a title, hit <RETURN>. For our demonstration we do not really need a title, so hit the <RETURN>.

You will next be asked to enter the destination of where you would like your file to be printed. Most of the time, you would like your report to be sent to the printer in which case you may hit the <RETURN>. If it happens you would like your report to be written to another file on the disk, enter the name of the file you would like it to be stored under.

```
************************************************************************
*                                                                      *
*   CalcStar Dump vr  1.Ø                                              *
*   CalcStar file name (<Return> to quit): BALSHEET.CSD,               *
*   Comments?                                                          *
*   Output file (<Return> for printer):                                *
*                                                                      *
************************************************************************
```

Before you answer this prompt, it is important to make sure the printer is connected and ready to go because once this prompt is entered the printing will begin. When the printing is complete, there will be another prompt asking

```
************************************************************************
*                                                                      *
*   CalcStar Dump vr 1.Ø                                               *
*   CalcStar file name (<Return> to quit): BALSHEET.CSD,               *
*   Comments?                                                          *
*   Output file (<Return> to quit):                                    *
*   CalcStar file name (<Return> to quit):                             *
*                                                                      *
************************************************************************
```

If you would like to print the contents of another file, enter a new file name. You may supply a Comment line for each file, but if you selected the printer for the first file, the program will assume that all subsequent files are to be printed also. If this printout was the last one you needed, hit <RETURN> and the program will return to CP/M.

For now, hit <RETURN> since we will not need to repeat the demonstration. You may take a look at the replication of the printout that resulted from our balance sheet file. The sample printout is on the following page.

CalcStar File BALSHEET.CSD -

```
Position B1 Width 20 Type:  Text (Centered)       :ASSETS
Position A4 Width 28 Type:  Text (Centered)       :CURRENT ASSETS
Position A5 Width 28 Type:  Text (Left justified) :CASH
Position B5 Width 20 Type:  Numeric :8000000 =  8000000.000000000000
Position A6 Width 28 Type:  Text (Left justified) :ACCOUNTS RECEIVABLE
Position B6 Width 20 Type:  Numeric :100000 =  100000.000000000000
Qosition A7 Width 28 Type:  Text (Left justified) :INVENTORY
Position B7 Width 20 Type:  Numeric :5225000 =  5225000.000000000000
Position B8 Width 20 Type:  Text (Repeating)      :-
Position A9 Width 28 Type:  Text (Centered)       :TOTAL CURRENT ASSETS
Position C9 Width 13 Type:  Numeric :+SUM(B5>B7) =  13325000.000000000000
Position C11 Width 13 Type:  Text (Repeating)      :-
Position A12 Width 28 Type:  Text (Centered)       :TOTAL ASSETS
Position C12 Width 13 Type:  Numeric :+SUM(B5>B7) =  13325000.000000000000
Position C13 Width 13 Type:  Text (Repeating)      :-
Position A14 Width 28 Type:  Text (Centered)       :TOTAL ASSETS
Position D14 Width 13 Type:  Numeric :+SUM(B5>B7) =  13325000.000000000000
Position D15 Width 13 Type:  Text (Repeating)      :=
Position B20 Width 20 Type:  Text (Left justified) :LIABILITIES & EQUITY
Position A23 Width 28 Type:  Text (Centered)       :CURRENT LIABILITIES
Position A24 Width 28 Type:  Text (Left justified) :ACCOUNTS PAYABLE
Position A25 Width 28 Type:  Text (Left justified) :NOTES PAYABLE
Position A27 Width 28 Type:  Text (Centered)       :TOTAL CURRENT LIABILITIES
Position C27 Width 13 Type:  Numeric :+SUM(B24>B25) =  0.000000000000
Position A30 Width 28 Type:  Text (Centered)       :TOTAL LIABILITIES
Position A33 Width 28 Type:  Text (Centered)       :OWNERSHIP & EQUITY
Position A34 Width 28 Type:  Text (Left justified) :CAPITAL
Position B34 Width 20 Type:  Numeric :8500000 =  8500000.000000000000
Position A35 Width 28 Type:  Text (Left justified) :NET INCOME
Position B35 Width 20 Type:  Numeric :6000 =  6000.000000000000
Position B36 Width 20 Type:  Text (Repeating)      :-
Position A37 Width 28 Type:  Text (Centered)       :TOTAL WORTH
Position C37 Width 13 Type:  Numeric :+SUM(B34>B35) =  8506000.000000000000
Position C39 Width 13 Type:  Text (Repeating)      :-
Position A40 Width 28 Type:  Text (Centered)       :TOTAL OWNERSHIP & EQUITY
Position C40 Width 13 Type:  Numeric :+SUM(B34>B35) =  8506000.000000000000
Position A42 Width 28 Type:  Text (Left justified) :TOTAL LIABILITIES & EQUITY
Position C42 Width 13 Type:  Numeric :+C30+C40 =  8506000.000000000000
Position C43 Width 13 Type:  Text (Repeating)      :=
```

II.36 ADVANCED FEATURES

OUTPUT FILES

CalcStar files can easily be enhanced by WordStar. WordStar will process disk TXT files that are created by CalcStar's print command. Once a file is loaded into WordStar, any print enhancement capability available on your WordStar can be performed.

In addition to files written to the PRINTER or to a disk in TXT format, two other possibilities exist. The file named DISPLAY will "print" to the CRT in printer format. This is useful for a quick look of a print file for formatting purposes.

Another print feature allows for output of comma-delimited fields which can be used by SuperSort, MailMerge, DataStar, BASIC, etc. To write a file in this format, prefix the file name with a ">". For example: type ';P'. When the request for a filename appears, type 'B:>NUMBERS'<RETURN>. A comma-delimited fields file named NUMBERS.TXT is then generated on drive B. Each cell represents a field and each row a record.

CONSTANT FIELD REFERENCES IN FORMULAS

A formula may contain cell references that remain constant even when the formula is copied to other cells with the "relative" option. This is useful when a constant input value is needed in several relative-copied formulas. The demonstration file, DEMO, implements this feature, since the original asset value is used in each application of the depreciation formula. Such a reference is indicated by suffixing the cell reference with a "!" (bang) character. For example, the formula

```
+sum(A3>A7)+A8!*B17
```

will use the value at A8 no matter where the formula is copied to other cells with the "relative" option.

II.37 SUMMARY

We have now concluded our demonstration of all of the functions and command operations available with CalcStar. We hope that this manual has proven to be a helpful learning guide and will also assist you as a handy reference tool. To make this manual as complete as possible, we have included four appendixes to serve as a fast and easy reference source for use with the CalcStar program.

We hope you will enjoy using the CalcStar program and find it a valuable asset to your organization.

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SECTION III
APPENDICES

APPENDIX A

This appendix includes three sample applications of reports including a balance sheet, a sales analysis, and a paint cost estimation. The appendix includes both the finished report and a step by step outline of the operations required to create these reports. Consequently, these reports will serve as useful practice reports for you to gain more confidence in working with CalcStar. These reports are so common that they can also serve as models for you to design your own reports. A third benefit of this appendix is an extended demonstration of some of the operations available with CalcStar.

The first example included in this appendix is the balance sheet first introduced in section II.3. We shall duplicate the same recalculate steps after we demonstrate how to enter all the information needed to create the report.

I. Enter the report text

1. Goto B1 and enter: ';', 'F', 'W', and '20' to widen the column and then enter '/cASSETS'
2. Goto A4 and enter: ';', 'F', 'W', and '28' to widen the column and then enter '/cCURRENT ASSETS'
3. Goto A5 and enter 'CASH'
4. Goto A6 and enter 'ACCOUNTS RECEIVABLE'
5. Goto A7 and enter 'INVENTORY'
6. Goto A9 and enter '/cTOTAL CURRENT ASSETS'
7. Goto A12 and enter '/cTOTAL ASSETS'
8. Goto A14 and enter '/cTOTAL ASSETS'
9. Goto B5 and enter '8000000'
10. Goto B6 and enter '100000'
11. Goto B7 and enter '5225000'
12. Goto B8 and enter '/=-'
13. Goto C9 and enter: ';', 'F', 'W', and '13' to widen the column and then enter '+SUM(B5>B7)'
14. Goto C11 and enter '/=-'
15. Goto C12 and enter '+SUM(B5>B7)'
16. Goto C13 and enter '/=-'
17. Goto D14 and enter: ';', 'F', 'W', and '13' to widen the column and then enter '+SUM(B5>B7)'
18. Goto D15 and enter '/=='
19. Goto B20 and enter 'LIABILITIES & EQUITY'
20. Goto A23 and enter '/cCURRENT LIABILITIES'
21. Goto A24 and enter 'ACCOUNTS PAYABLE'
22. Goto A25 and enter 'NOTES PAYABLE'
23. Goto A27 and enter '/cTOTAL CURRENT LIABILITIES'
24. Goto A30 and enter '/cTOTAL LIABILITIES'
25. Goto A33 and enter '/cOWNERSHIP & EQUITY'
26. Goto A34 and enter 'CAPITAL'

27. Goto A35 and enter 'NET INCOME'
28. Goto A37 and enter '/cTOTAL WORTH'
29. Goto A4Ø and enter '/cTOTAL OWNERSHIP & EQUITY'
3Ø. Goto A42 and enter 'TOTAL LIABILITIES & EQUITY'
31. Goto B24 and enter '9ØØØ'
32. Goto B25 and enter '481ØØØØ'
33. Goto B26 and enter '/=-'
34. Goto C27 and enter '+SUM(B24>B25)'
35. Goto C29 and enter '/=-'
36. Goto C3Ø and enter '+SUM(B24>B25)'
37. Goto B34 and enter '85ØØØØØ'
38. Goto B35 and enter '6ØØØ'
39. Goto B36 and enter '/=-'
4Ø. Goto C37 and enter '+SUM(B34>B35)'
41. Goto C39 and enter '/=-'
42. Goto C4Ø and enter '+SUM(B34>B35)'
43. Goto D42 and enter '+C3Ø + C4Ø'
44. Goto D43 and enter '/=='

II. Save the report

1. Enter: ';', 'S', 'BALSHEET'

III. Recalculate demonstration

1. Goto B7 and enter '522585Ø.35'
2. Goto B24 and enter '985Ø.35'
3. Enter: ';', 'R', 'A' and watch the total on both sides of the report change from 13,325,ØØØ.ØØ to 13,325,85Ø.35.

IV. Print the report

1. Enter: ';', 'P', <CR>, <CR>, 'D43', <CR>, '8Ø', 'N', <SPACE>, 'BALANCE SHEET', '12-31-81', '<CR>'.

If you would like to print another file's contents, enter 'Y' and the sequence of steps you have just completed will be repeated for another file. If this printout was the last one you needed, enter 'N' and the CP/M prompt will be re-displayed and you may continue your work.

For our demonstration, enter 'N' since we will not need to repeat the demonstration.

The second example report included in this appendix is a job cost estimate report. The steps to enter the report and the resulting printout are as follows.

I. Enter the report text

1. Goto A1 and enter: ';', 'F', 'W', and '2Ø' to widen the column and then enter 'Acme Paint, Inc.'
2. Goto A2 and enter 'Cost Estimation Form'
3. Goto A3 and enter '/=-'
4. Goto A5 and enter '/rNumber of walls:'
5. Goto A7 and enter '/rAvg. wall hgt.:'
6. Goto A8 and enter '/rAvg. wall width:'
7. Goto A1Ø and enter '/rPrice paint/gal.:'
8. Goto A11 and enter '/rSq. ft./gal.:'
9. Goto A12 and enter '/rApplication speed:'
10. Goto A14 and enter '/rSquare feet='
11. Goto A16 and enter 'Hourly wages:'
12. Goto A18 and enter '/rFixed overhead:'
13. Goto A2Ø and enter '/rMaterial cost='
14. Goto A21 and enter '/rLabor cost='
15. Goto A23 and enter '/rTOTAL'
16. Goto C5 and enter: ';', 'F', and 'F' to set the form mode at C5 and then enter '5'
17. Goto C7 and enter: ';', 'F', 'F' and then enter '12'
18. Goto C8 and enter: ';', 'F', 'F' and then enter '12'
19. Goto C1Ø and enter: ';', 'F', 'F' and then enter '6'
20. Goto C11 and enter: ';', 'F', 'F' and then enter '3ØØ'
21. Goto C12 and enter '25Ø'
22. Goto C14 and enter '+C7 * C8 * C5'
23. Goto C16 and enter '7.89'
24. Goto C18 and enter '17.5Ø'
25. Goto C2Ø and enter '+C14/C11 * C1Ø'
26. Goto C21 and enter '+C14/C12 * C16'
27. Goto C22 and enter '/=-'
28. Goto C23 and enter '+C18 + C2Ø +C21'
29. Goto C24 and enter '/=='

II. Save the file

1. Enter: ';', 'S', 'PAINTCOST'

III. Enter data by using the Automatic form mode

1. Enter: ';', 'A', '4', '1Ø', '1Ø', '5','3ØØ'. The total will now be automatically recalculated.

IV. Print the report

1. Enter: ';', 'P', <CR>, <CR>, 'C24', <CR>, '8Ø', 'N', <SPACE>, 'SAN DIEGO PROFESSIONAL BLDG.', 'Suite 999', '1-27-81', <CR>.

If you would like to print another file's contents, enter 'Y' and the sequence of steps you have just completed will be repeated for another file. If this printout was the last one you needed, enter 'N' and the CP/M prompt will be re-displayed and you may continue your work.

For our demonstration, enter 'N' since we will not need to repeat the demonstration.

The third and last example in this appendix is a quarterly sales analysis. The steps for entering the report and producing a printout are outlined below.

I. Entering the report text

1. Goto A5 and enter: ';', 'F', 'W', and '14' to widen the column and then enter 'district A'
2. Goto A6 and enter ' product 1'
3. Goto A7 and enter ' product 2'
4. Goto A8 and enter ' product 3'
5. Goto A10 and enter '/ctotal'
6. Goto A12 and enter 'district B'
7. Enter: ';', 'C', 'A6>A8', 'A13>A15'
8. Goto A17 and enter '/ctotal'
9. Goto A19 and enter 'all districts'
10. Enter: ';', 'C', 'A6>A8', 'A20>A22'
11. Goto A24 and enter '/ctotal'
12. Goto A25 and enter '/==' and enter: ';', 'C', 'A25','C25>G25'
13. Goto A28 and enter '% by product'
14. Enter: ';', 'C', 'A6>A8', 'A29>A31'
15. Goto A33 and enter '/=+-'
16. Goto A35 and enter '% by district'
17. Goto A36 and enter 'district A'
18. Goto A37 and enter 'district B'
19. Goto C1 and enter '/c1st'
20. Goto C2 and enter '/cqtr.' and then enter: ';', 'C','C2', 'D2>G2'
21. Goto C3 and enter '/==' and then enter: ';', 'C', 'C3','D3>G3'
22. Goto C6 and enter: ';', 'F', 'P', and '0' to set the decimal precision to 0 for column C and then enter '125'
23. Goto C7 and enter '100'
24. Goto C8 and enter '200'
25. Goto C9 and enter '/=-' and then enter: ';', 'C', 'C9','D9>G9'
26. Goto C13 and enter '100'
27. Goto C14 and enter '90'
28. Goto C15 and enter '165'
29. Enter: ';', 'C', 'C9', 'C16>G16'
30. Goto C20 and enter '+C6 + C13'
31. Goto C21 and enter '+C7 + C14'
32. Goto C22 and enter '+C8 + C15'
33. Enter: ';', 'C', 'C9', 'C23>G23'
34. Goto D1 and enter '/c2nd'
35. Goto D6 and enter: ';', 'F', 'P', and '0' and then enter '115'
36. Goto D7 and enter '110'
37. Goto D8 and enter '220'
38. Goto D13 and enter '105'
39. Goto D14 and enter '103'
40. Goto D15 and enter '173'
41. Enter: ';', 'C', 'C20>C22', 'D20>D22', and 'R'
42. Goto E1 and enter '/c3rd'
43. Goto E6 and enter: ';', 'F', 'P', and '0' and then enter '130'
44. Goto E7 and enter '115'
45. Goto E8 and enter '210'
46. Goto E13 and enter '108'

47. Goto E14 and enter '1ØØ'
48. Goto E15 and enter '168'
52. Enter: ';', 'C', 'D2Ø>D22', 'E2Ø>E22', and 'R'
53. Goto F1 and enter '/c4th'
54. Goto F6 and enter: ';', 'F', 'P', and 'Ø' and then enter '12Ø'
55. Goto F7 and enter '1Ø8'
56. Goto F8 and enter '215'
57. Goto F13 and enter '112'
58. Goto F14 and enter '1Ø5'
59. Goto F15 and enter '179'
6Ø. Enter: ';', 'C', 'E2Ø>E22', 'F2Ø>F22', and 'R'
61. Goto G6 and enter: ';', 'F', 'P', and 'Ø' and then enter '+SUM(C6>F6)'
62. Enter: ';', 'C', 'G6', 'G7>G8', and 'R'
63. Enter: ';', 'C', 'G6>G8', 'G13>G15', and 'R'
64. Enter: ';', 'C', 'G13>G15', G2Ø>G22', and 'R'
65. Goto C1Ø and enter '+SUM(C6>C8)'
66. Enter: ';', 'C', 'C1Ø', 'D1Ø>G1Ø'
67. Goto C17 and enter '+SUM(C13>C15)'
68. Enter: ';', 'C', 'C17', 'D17>G17', and 'R'
69. Goto C24 and enter '+SUM(C2Ø>C22)'
7Ø. Enter: ';', 'C', 'C24', 'D24>G24', and 'R'
71. Goto C29 and enter '+C2Ø/C24 * 1ØØ' and then enter: ';', 'F', 'P', and 'E1' to set the decimal precision to 1 place
72. Enter: ';', 'C', 'C29', 'D29>G29', and 'R' and then goto D29, E29, F29, and G29 and at each location enter: ';', 'F', 'P', and 'E1'
73. Goto C3Ø and enter '+C21/C24 * 1ØØ' and then enter: ';', 'F', 'P', and 'E1'
74. Enter: ';', 'C', 'C3Ø', 'D3Ø>G3Ø', and 'R' and then Goto D3Ø, E3Ø, F3Ø, and G3Ø and at each location enter: ';', 'F', 'P', and 'E1'
75. Goto C31 and enter '+C22/C24 * 1ØØ' and then enter: ';', 'F', 'P', and 'E1'
76. Enter: ';', 'C', 'C31', 'D31>G31', and 'R' and then Goto D31, E31, F31, and G31 and at each location enter: ';', 'F', 'P', and 'E1'
77. Goto C36 and enter '+C1Ø/C24 * 1ØØ' and then enter: ';', 'F', 'P', and 'E1'
78. Enter: ';', 'C', 'C36', 'D36>G36', and 'R' and then Goto D36, E36, F36, and G36 and at each location enter: ';', 'F', 'P', and 'E1'
79. Goto C37 and enter 'C17/C24 * 1ØØ' and then enter: ';', 'F', 'P', and 'E1'
8Ø. Enter: ';', 'C', 'C37', 'D37>G37', and 'R' and then Goto D37, E37, F37, and G37 and at each location enter: ';', 'F', 'P', and 'E1'

II. Save the report

1. Enter: ';', 'S', 'QTRSALES'

III. Print the report

1. Enter: ';', 'P', <CR>, <CR>, 'G37', <CR>, '132', 'N', <SPACE> , 'Sales Analysis by Quarter 1979', 'Beta IV Corporation', <CR>.

If you would like to print another file's contents, enter 'Y' and the sequence of steps you have just completed will be repeated for another file. If this printout was the last one you needed, enter 'N' and the CP/M prompt will be re-displayed and you may continue your work.

For our demonstration, enter 'N' since we will not need to repeat the demonstration.

APPENDIX B

This appendix includes an alphabetical and symbolical listing of the function and command operations available with CalcStar and a short explanation of the operation along with a reference to the section in this manual which describes the operation in detail.

;A =	Automatic form mode for entering data in specific entries	II.25
;C =	Copy entry (or range of entries) into an entry (or range)	II.8
;D =	Delete an entry, column, row, or entire array	II.23
;E =	moves the array so cursor location is upper left corner	II.14
;F =	changes column width changes decimal precision changes form mode	II.5 II.1Ø II.25
;G =	move the cursor to specified location	II.6
;H =	displays the Help file for handy reminders	II.33
;I =	Insert a row or column	II.22
;L =	Load a file that has been saved into the CalcStar array	II.3Ø
;M =	Merge a saved file with current contents of array	II.21
;O =	toggles the Order of evaluation for the Recalculate command and changes the effect of <RETURN> and CTRL-Z	II.2Ø
;P =	Prints the given section of the array	II.26 II.27
;Q =	exits (Quits) the CalcStar program	II.32
;R =	Recomputes an entry or all formulas in the array	II.19
;S =	Saves the contents of the array onto the disk	II.12
;W =	shows you the row and column headings for the entry Where the cursor is presently located	II.16A
;= =	locks in column and row headings for entire array (an extended What command)	II.16B
;? =	informs you of the amount of storage space still available	II.13
;* =	extends the window into the CalcStar array to 15 rows from the standard 1Ø row display	II.3Ø
+sum(range of entries) =	sums the values contained within the given range	II.17

+avg(range of entries) = computes the average of the values contained within the given range II.17

+cnt(range of entries) = returns the number of numeric entries contained within the given range II.17

+max(range of entries) = returns the maximum value contained within the given range II.17

+min(range of entries) = returns the minimum value contained within the given range II.17

+regr(range of entries,first coordinate of another range) = computes a linear regression line and returns the average of the second range (dependent variable) II.29

+proj(value) = inserts a value for independent variable into the regression equation and returns the predicted value (the dependent variable) II.29

+depd(value) = inserts a value for the dependent variable into the regression equation and solves for and returns the best estimate for the independent variable II.29

+slope() = returns the slope of the regression equation which may be used to evaluate the degree of correlation II.29

/c = center justifies a text entry II.4

/l = left justifies a text entry II.4

/r = right justifies a text entry II.4

/= = will repeat the characters following = throughout the entry II.7

/p = printing will execute a form feed. Must be in first print column II.28

\ = allows insertion of comment into numeric entry location II.18

@ = enters cursor location into current indication II.15

^ = toggles text type between text and numeric II.11

<CTRL E> = moves the cursor up one location II.2

<CTRL X> = moves the cursor down one location II.2

<CTRL S> = moves the cursor to the left one location II.2

<CTRL D> = moves the cursor to the right one location II.2

<ESC> = aborts a command II.5

<CTRL Z> = moves the cursor to the first entry of next row II.2

<CR> or RETURN = enters data if something on edit line or moves the cursor to the right one location or aborts a command II.2 II.5

<TAB> = moves cursor to specified location. Same as Goto command II.2

[arithmetic expression]? = evaluates the expression without entering it into the array II.1

APPENDIX C

This appendix includes a list of the error messages that may occur during CalcStar usage:

bad coord — coordinate entered cannot be used for intended purpose
bad form length — specified form length is not within required range (1..66)
bad range coord — range of coordinates cannot be used for intended purpose

can't create — not enough memory to set format precision
can't open — not enough space on disk or disk needs crunching
can't open file — not enough room to open file on disk
couldn't read TERMCAP.SYS — system could not read a necessary file; related to hardware. Need to get proper version of file

DATA IS PROBABLY DAMAGED — from entering too long of a report and there was not enough memory
data too wide -- specified printing section is too wide for specified printing width
Delete character is underscore ("_") -- certain machines will have the underscore key as their delete key

ERROR -> <expression>? — system could not interpret entry correctly
ERROR would delete ref(s) at <coord> -- specified deletion would eliminate data on which other formulas are dependent, so formulas must first be changed

FATAL ERROR: not on disk -- disk is missing an important CalcStar file and cannot operate until it is on the disk
FILEWRITE ERROR — system had trouble writing file to the disk

math op error
numeric overflow — space is not large enough for intended operation
math op error
divide by zero -- expression would lead to a value being divided by Ø, which is undefined
MEMORY IS TOO LOW — not enough room to make the intended insertion

!n! — column is not wide enough
no form flags — no automatic form modes have been set
not along row/column -- specified copy is not in a straight vertical or straight horizontal line
not ok — password is not correct

OUT OF MEMORY — no memory left; something must be deleted

Prec. must be Ø..12 — precision entry is not within required range

READ ERROR — there are bad blocks where the file is stored

sizes don't agree — number of coordinates you are copying from and number of coordinates you are copying to are different

Width must be 3..63 — column width entry is not within required range
WRITE ERROR — disk gets full while writing a file
write error, not the same -- second password is not the same as the first password
write error <file> not found — file does not exist as entered
write error I/O — disk needs crunching
write error Close — disk needs crunching
write error end>start — in saving a partial file, the top left coordinate must come before the bottom right coordinate
write error bad coord — invalid coordinate entered
WRITE CLOSE ERROR — diskette is wrong or insufficient room

EVALUATION ERRORS

Ø — value range error:
math overflow
divide by zero
function cannot evaluate value entered
1 — illegal coordinate or wrong coordinate format
2 — range is not a row or column
3 — missing a '(' or ')'
4 — unknown function, function typed incorrectly
6 — terminal expression is illegal
7 — illegal characters at the end of the line
8 — number is not in correct form
9 — error in regression values
12 — too many parenthetical levels
255 — illegal value in REGR function

APPENDIX D

This appendix contains the information that may be needed when installing CalcStar.

The program INSTCS provides three ways to configure CalcStar for your terminal. Method 1 allows the WordStar user to move the configuration information from his WordStar system directly to CalcStar. This creates a CalcStar environment that is consistent with WordStar usage. Method 2 is used if a WordStar system disk is not available. This method presents you with menus of terminals from which you select the one that represents your terminal. If neither of these methods applies to your situation, then you can use Method 3, a series of questions to which you must respond with hexidecimal values (or actual keystrokes, if applicable) regarding characteristics of your terminal. Prior to such an installation, you will need information on: keyboard cursor control keys (WordStar standard recommended); code used to position screen cursor; keys used for Escape, Backspace, Delete; required initialization and termination controls for terminal; and code to be used to move cursor to first column next row (<CTRL> Z recommended). The full list is shown below.

Method 1 makes use of the WS.COM file in your WordStar system. Method 2 uses a file named INSTCS.DAT on the CalcStar distribution disk. Method 3 creates a terminal description which can be stored in INSTCS.DAT in place of one you will not be using. All three create a file named TERMCAP.SYS, whose layout follows:

(All addresses are **hexidecimal offsets** from the beginning of TERMCAP.SYS)

CONTENTS	**ADDRESS**	
Terminal Name	ØØ-17	
Cursor right key	18	>Note: if high order bit set in any
Cursor left key	1A	>of these codes, it is preceeded by
Cursor down key	1C	>the Keyboard Prefix code in loc 26
Cursor up key	1E	>
Next row first col	2Ø	>
Escape	22	>
Delete	24	>
Keyboard Prefix	26	
Move left	28-2D	
Clear screen	2E-33	
Clear to end of line	34-39	
Highlight off	3A-3F	
Highlight on	4Ø-45	
Lead in for cursor pos	46-4D	
Column offset	4E	
Separator	5Ø-53	
Row offset	54	
Terminator of position	56-59	
Row before column	5A	if =1 then reverse
Terminal end sequence	5C-65	
Terminal initialize	66-6F	

INSTCS uses two forms of input: the data in INSTCS.DAT; and keyboard entries. It always writes a new TERMCAP.SYS file, and it also may update INSTCS.DAT if you condition it to do so. The use of Method 3 may require the assistance of your dealer in determining the codes that must be filled in, but the information should be available in the manual that came with your terminal.

Your configuration session will begin with your typing, in response to the CP/M prompt

```
B>INSTCS <RETURN>
```

which will first display a sign-on page and then ask the question

```
Normal first-time installation of CalcStar (Y/N) ?
```

A reply of

```
Y
```

will set you up for Method 2. You will see a table of terminal names and letters. Let us suppose that your terminal is a Televideo 950. This has code B. In answer to the prompt

```
Please enter selection:
```

type a B. The next prompt will say

```
Current Terminal is Televideo 950
  OK (Y/N):
```

A reply of 'Y' will display the prompt

```
Are the modifications now complete (Y/N) ?
```

A reply of "Y" will give you some messages about installing CalcStar and then the message

```
Printer is accessed through normal CP/M LST: device
channel.

 OK (Y/N):
```

A reply of 'Y' will end the install process and present a CP/M prompt.

What has happened is this: INSTCS has retrieved the definition of the Televideo 950 from the file INSTCS.DAT, placed it in TERMCAP.SYS, and CalcStar is ready to go.

If your response to the "Normal first-time installation" prompt is 'N', then you are presented with a further selection

A Modification of existing installation

B Installation of WordStar file

If you select B, you have chosen Method 1. You will be asked for the name of the WordStar file to be used, e.g. A:WS.COM. The data in WS.COM that CalcStar needs will then be placed in TERMCAP.SYS and CalcStar is ready for use. It is important to note that INSTCS.DAT is **not** affected by this process.

A selection of 'A' above will lead you through a series of questions you must answer about the characteristics of your terminal. At the end of the questions, you may review your responses by answering 'Y' when asked if you want to make any more changes. When you are satisfied that the parameters look all right, a 'N' reply to the "any more changes?" question will cause TERMCAP.SYS to be written with the information you provided. Again, **INSTCS.DAT will be neither read nor written.**

In order to update INSTCS.DAT, you must type a <CNTRL> O first before answering the A or B question. There will be no response by the system until later. Then, answer A or B as appropriate. When you have completed answering the questions and have checked them for accuracy, you will be asked

What terminal definition do you wish to store this in
(A-U) or <RETURN>?

A selection from the sequence A through U will replace the existing terminal defined under the letter you choose to be replaced by the one you have just entered, so select one that you won't ever need. A <RETURN> will store nothing in INSTCS.DAT and the program will exit with no further action.

APPENDIX E

This appendix serves as a general appendix or index where many topics relating to the operation of the CalcStar program may be indexed. The subjects are listed alphabetically and you may refer to the section listed in order to have more explanation. The page number is also shown, displayed in brackets.

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