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AN INTRODUCTORY GUIDE

TO

QUATTRO

THE PROFESSIONAL SPREADSHEET

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1. INTRODUCTION TO SPREADSHEETS

1.1 What is a Spreadsheet?

The spreadsheet is software which contains a "grid" for entering, viewing, and editing data. All spreadsheets also have capabilities to manipulate the entered data by using standard mathematical and statistical "functions."

The "grid" referred to above can be visualized as an "electronic ledger," as is usually the case with individuals who use spreadsheets for financial applications. Each entry of this ledger can be subjected to wide variety of operations. The spreadsheet can also be visualized as an array or a matrix, in which each entry will correspond to an element of this array. Each and every element of this array is referred to as a cell. The location of this cell is defined by it's column and row number.

The first column is marked column-"A," the second column as column-"B," etc. In QUATTRO one can have up to 256 columns. After exhausting the letters of the alphabet, the column numbering continues as "AA," "AB," etc. all the way to column "IV".

The rows are numbered in numeric sequence, starting with 1. QUATTRO can handle up to 8192 rows. The first cell's address is "A1," which is located at the upper left hand corner of this large "array." For example, the address of the cell at 4th row and 3rd column is "C4."

In using a spreadsheet program the user will populate the cells, i.e. enter data, and then apply all required mathematical and statistical operations to a block(s) of cells.

‡‡
All of the figures included in this guide are copied from Getting Started with QUATTRO and QUATTRO User's Guide published by Borland International.
‡‡

1.2 A Historical Perspective

The first spreadsheet program marketed was called VISICALC, which was capable of handling 254 rows and 63 columns. The original developers had "financial computations" in mind. However, the concept of a spreadsheet was attractive to by engineers and scientists. Thus, today, spreadsheet packages are used for a very wide variety of applications in almost every profession.

The best selling microcomputer software, not only for spreadsheets, but any application software is LOTUS 1-2-3. LOTUS 1-2-3 set de facto industry standards for the development of all spreadsheet software. Currently, Version 2.XX of LOTUS 1-2-3 is widely used. It is expected that the next version, i.e. Version 3.00, will be released in the near future with major enhancements over Version 2.XX.

1.3 Two vs. Three Dimensional Spreadsheets

LOTUS 1-2-3 and QUATTRO are two dimensional spreadsheets. In other words, they have one "flat array," where by specifying the row and column number one can identify the location of the "cell." There are also three dimensional spreadsheets. These spreadsheets contain a number of two dimensioned arrays. In addition to row and column number, one needs to identify the "page number" as well. A typical example of this type of software is INTECALC, for which Lehigh University has a site license. It is expected that the next version of LOTUS 1-2-3 will also be a three dimensional spreadsheet.

Even though LOTUS 1-2-3 is the most widely used spreadsheet software, there still exists a number of other packages which can do most of the work of LOTUS 1-2-3. In some cases, some of the "options" of these packages are "better" that those of LOTUS 1-2-3. A typical example of this is QUATTRO. QUATTRO has almost all of the capabilities of the current version of LOTUS 1-2-3, plus far superior "graphics." Besides, Lehigh University has a site License from Borland International, the developer of QUATTRO, for various Borland products, including QUATTRO.

Any previous user of LOTUS 1-2-3 will find the mastery of the use of QUATTRO quite simple. Also, any first time users of a spreadsheet software will find that once they are sufficiently familiar with QUATTRO, they will be able to use LOTUS 1-2-3 without any problems.

1.4 What is a BLOCK?

In a spreadsheet a cell corresponds to one location defined by its row and column number. However, in most computations and operations we need to identify a region containing a number of cells. Such a region is called a **block**. For example, the upper left hand corner of a block may have cell "C3," while the upper right hand corner of the block may contain cell "E3." The lower left and lower right corners of the block may contain elements "C5" and "E5," respectively. Once this block is marked by using the appropriate cursor keys, i.e., the arrow keys, then the color and/or shading of the block on the monitor screen will be different. In this case, the block will contain cells C3, D3, E3, C4, D4, E4, C5, D5, and E5; 9 elements are included in this block.

1.5 Graphics

A spreadsheet containing a very limited amount of information can be easily studied by "anybody(?)" However, if the information contained is more than trivial, and/or, especially, if the information contained in the spreadsheet is to be included in a report or presented at a meeting, then the use of graphics options of the spreadsheet is essential. Almost all spreadsheet software have the capability to draw bar, stacked bar, x-y plots, pi-charts, etc. The graphics options of the program will employ the data contained in the spreadsheet in the generation of the graphics. The graphs are displayed on the monitor screen. Hardcopy of these graphs can also be obtained.

1.6 Database Management

A database is an organized collection of data/information, which permits the manipulation of the data. For example, a class list of a multi-section course can contain the names, social security numbers and the university I.D. numbers of the students. In addition, section number and section instructor's name can be in-

cluded. As the semester progresses, the grades for various examinations, assignments, etc. can be entered. The course leader may very well wish to develop class lists based on section assignment, based on grades, or some slightly exotic items like the list of those who missed the quizzes. In addition, one can develop a list of students whose course grade is above, for example, 75%. These activities are all related to database management.

It is "claimed" that all spreadsheet programs, including QUATTRO, have database management capabilities. However, as the user gets more demanding in the manipulation of data, then the use of dedicated database management software is recommended, such as dBASEIII+, RBASE:5000, etc. Most of these database management software accept the raw data files generated by most of the spreadsheet software, e.g., QUATTRO, LOTUS 1-2-3. However, if the database management activities are limited in scope, then the use of QUATTRO is sufficient for database management purposes.

2. HOW TO USE QUATTRO

The original QUATTRO documentation consists of three "guides," Getting Started with QUATTRO, User's Guide, and Reference Guide. It is nice to know the contents of these guides, however, the guides have a total thickness of about 2 inches. Without going through these guides and only studying the contents of this document one can start using QUATTRO. In addition, QUATTRO has extensive "HELP" capabilities which will be described later in this guide. Prior to going to the extensive printed manuals, guides, and textbooks, the users are strongly advised to use the HELP facilities of the software.

QUATTRO can be used with a microcomputer with floppy drives or with hard disk. Since the access speed to the files on floppy diskettes are slow, as compared to the hard disk systems, the use of microcomputers with hard disks is strongly suggested.

Almost all public microcomputer sites of the Lehigh University Computing Center have Local Area Networks (LAN). Most of the file servers at these sites have QUATTRO on the hard disk(s). After booting the microcomputer with the LAN diskette, make appropriate changes in your default drives and directories. Issue the command CD QUATTRO, to change to the QUATTRO subdirectory. Then issue the command Q. This will activate the software. Your monitor screen will look like Fig. 1. You are now ready to use the software.
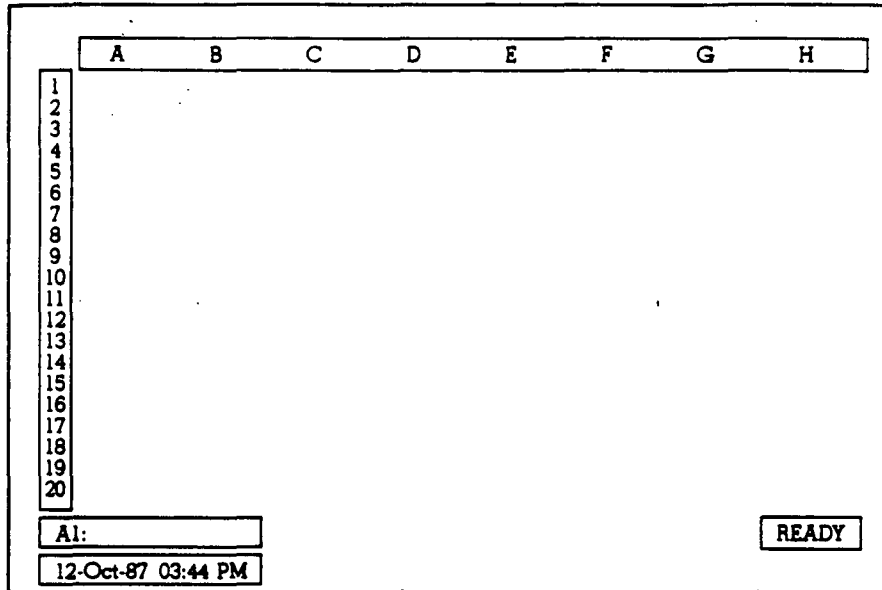
Fig. 1: A Blank QUATTRO Spreadsheet

3. MASTER MENU

3.1 Definitions

A close inspection of the display on your monitor is needed. This will permit the definition of some of the key terms. These terms are shown in Fig. 2.
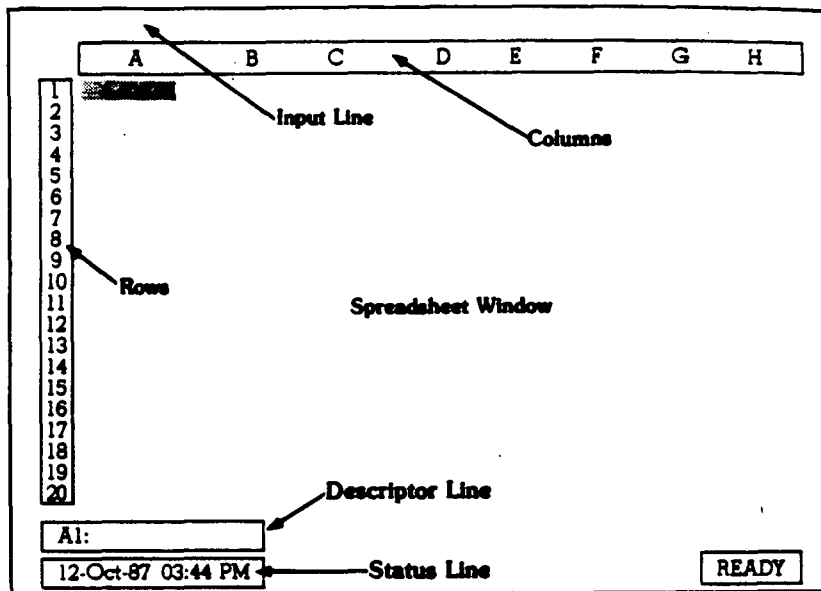
Fig. 2: The QUATTRO Spreadsheet

Row and column identification numbers and letters are displayed as shown in the figure. Once you "activate" QUATTRO, you will find that the "area" corresponding to CELL A1 is displayed in a different color and/or shade. On the second line from the bottom the descriptor line will show the address of the cell where the "pointer," i.e., the highlighted cell, is located. The contents of this cell, if any, will also be displayed. At the top of the screen you will see a blank line. All entries you make through the keyboard and cursor keys will be displayed on this line.

3.2 Help and Escape

QUATTRO has extensive "help" capabilities. For example, when you are at the screen shown in Fig. 1, you can press "F1" key. Your screen display will look like Fig. 3.

```
┌──────────────────────────────────────────────────────────────┐
│  ┌────────────────────────────────────────────────────────┐  │
│  │              Quattro Help Topics                       │  │
│  └────────────────────────────────────────────────────────┘  │
│                                                              │
│   ┌──────────────────────────────┐                           │
│   │ >> Help    How to use help.  │   >> Functions   @ functions and │
│   └──────────────────────────────┘                    examples.   │
│    >> Basics    A guide to Quattro.                               │
│                                      >> Macro Topics Help with macros. │
│    >> Keyboard Description of keyboard                             │
│                and special keys.     >> Menu Topics  Help with menu │
│                                                       selections.  │
│    >> Set up  . Setting up and                                    │
│                 customizing Quattro.  >> 1-2-3        About Quattro for │
│                                                       1-2-3 users. │
│    >> Pointing  Selecting cells and                               │
│                 blocks of cells.      >> Add-Ins      Menu Builder and │
│                                                       Transcript.  │
│                                                              │
│   ┌──────────────────────────────────────────────────────┐  │
│   │ Use arrow keys to move around help screen,◄┘ to select topic. │  │
│   └──────────────────────────────────────────────────────┘  │
│  ──────────────────────────────────────────────────────────  │
│   Next (Using Help)                          Menu Topics     │
│                     Advanced Topics          Back to Quattro  │
│                                                              │
│   ┌──────────────────────┐                                   │
│   │ 12-Oct-87  03:44 PM  │                                   │
│   └──────────────────────┘                                   │
└──────────────────────────────────────────────────────────────┘
```
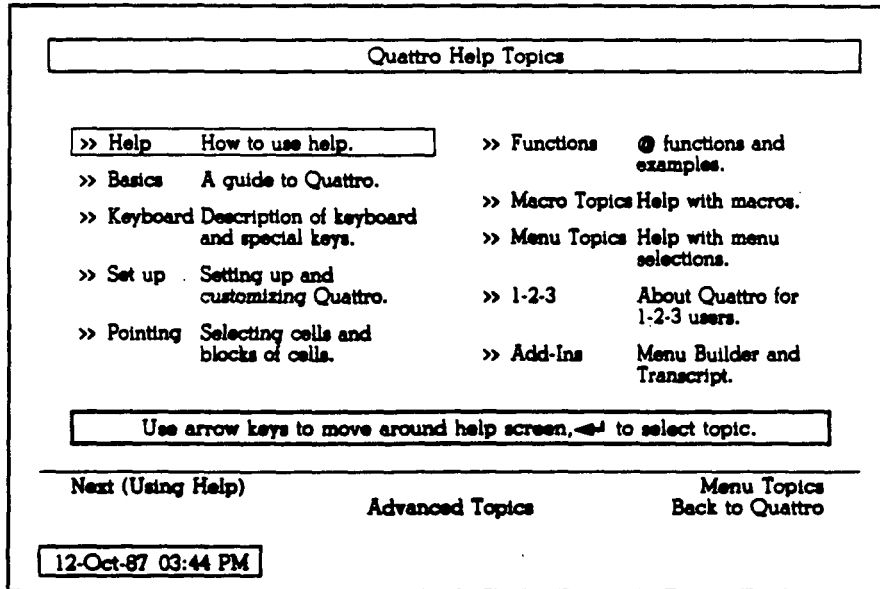
Fig. 3: The HELP Topics Screen

You can move the "highlighted" area from one subject to another via cursor control keys, i.e. the keys with arrow signs. When you reach the subject matter about which you want information simply press the RETURN key. You will get a summary of the subject matter. This help screen is not limited to the display shown on Fig. 3. The "help facility" of QUATTRO is "context sensitive." Depending upon which command you issue or the activity you undertake, by pressing "F1" key you will get the help screen associated with that particular operation. This eliminates the constant need to refer to the manuals.

To get out of the "help screen" and to return to the original spreadsheet screen, you need to press the ESCAPE key. The ESCAPE key can be considered as a "universal abort key." By pressing this key, you will go back to the previous command level. Another important use of this key will be to abort an improper

command. If the command you issued is incorrect, then the
program will indicate the error. To get out of this error and to
return to the "previous mode" or previous command level, simply
press the Escape key. Also note the use of the Escape key in the
following section on the use of menus.

3.2 Menus and Sub-Menus

One of the most attractive features of QUATTRO is it's menu
structure. Once the basic spreadsheet is displayed you can enter
a "slash," i.e. "/". Upon issuing this command your screen will
look like Fig. 4.
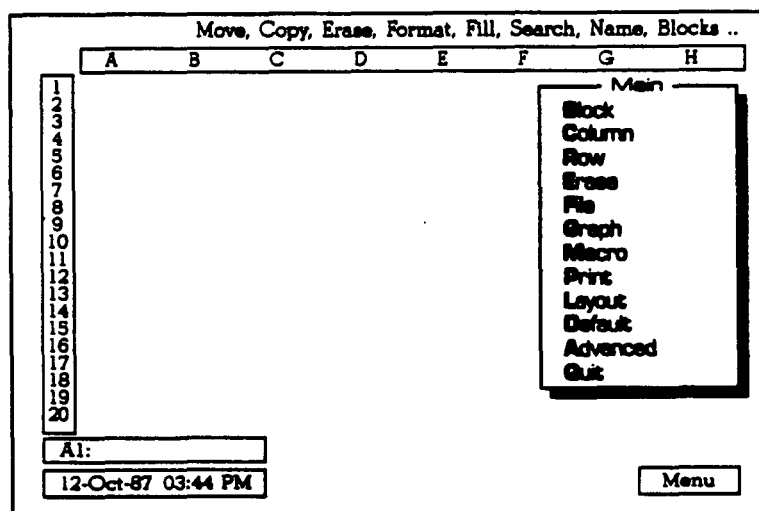
Fig. 4: The QUATTRO Main Menu

By using the "up arrow" or "down arrow" keys you can move the
"highlighting" from one menu item to another. If you press the
RETURN key, then the "command" corresponding to the highlighted
command will be issued. Instead of moving the highlighted area
by arrows, you can also issue the same command by entering the
first letter of the command via the keyboard.

Most of the entries of the master menu have sub-menus. You can practice identifying the contents of the sub-menus by a little trial and error. Any detailed information that might be provided herein will be outside the scope of this Guide; and this information can be found in QUATTRO's official "Guides."

3.3 Main Menu Entries
In order to familiarize the user with the capabilities of each entry at the main menu level, only a brief description will be provided.

3.3.1 BLOCK
The BLOCK menu contains subcommands that affect a block of cells you define within the spreadsheet. This block may be as small as one cell. It may be a column or a row of specified length. The "shape" of the block must be rectangular, for blocks containing more than one row and one column.

The sub-menu corresponding to BLOCK is shown in Fig. 5.
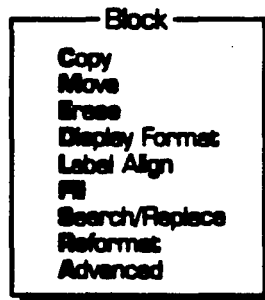
Fig. 5: The Block Menu

Through the available commands at the sub-menu level one can:

* Copy a block from one part of the spreadsheet to another.

* Move a block from one location to another.

* Erase the contents of a block.

* Change the display format of a block.

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* Change the alignment of labels.

* Automatically generate a series of value entries on specified cells.

* Search for specific data and replace it with new data.

* (Reformat and Advanced commands are beyond the scope of this Guide.)

3.3.2 COLUMN
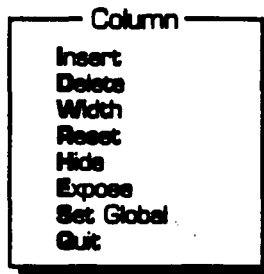The sub-menu associated with the COLUMN is shown in Fig. 6.

```
┌──── Column ────┐
│  Insert          │
│  Delete          │
│  Width           │
│  Reset           │
│  Hide            │
│  Expose          │
│  Set Global      │
│  Quit            │
└──────────────────┘
```

Fig. 6: The Column Menu

Brief descriptions associated with the entries in Fig. 6 are:

* Insert blank column(s) to the left side of the highlighted cell.

* Delete existing column(s) in the spreadsheet. Note that this deletion will cause the loss of data contained in these columns!

* Change the width of a given column.

* Temporarily remove columns from display without losing the contents.

3.3.3 ROW
The operations associated in this sub-menu are similar to those for COLUMN, except the operations will be carried out on row(s).

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3.3.4 ERASE

Erase command clears the spreadsheet. If this command is issued, without first saving the contents of the spreadsheet (See FILE below), you may lose valuable information and hours and hours of investment! Be careful!

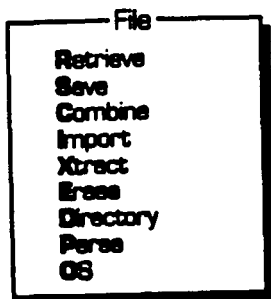### 3.3.5 FILE

The sub-menu for FILE is shown in Fig. 7.

```
┌──── File ────┐
│ Retrieve     │
│ Save         │
│ Combine      │
│ Import       │
│ Xtract       │
│ Erase        │
│ Directory    │
│ Parse        │
│ OS           │
└──────────────┘
```

Fig. 7: The File Menu

Some of the operations that can be carried out under the FILE menu are:

* Retrieve an existing spreadsheet file.

* Save the current spreadsheet on a hard disk or floppy.

* Combine two spreadsheets into one file.

* Load a file created by another spreadsheet software. (Note: You can import LOTUS 1-2-3 files.)

* Push to MS-DOS operating system. (You can return to QUAT-TRO by typing and entering EXIT at MS-DOS.)

* Etc.

3.3.6 GRAPH

This will be discussed separately in Chapter-5.

3.3.7 MACRO

A macro is a series of commands stored within the current spreadsheet. It can be considered as a "program" coded in QUATTRO understandable commands. This macro can be executed by issuing "special commands." Due to the advanced nature of this subject, it will not be covered in this Guide.

3.3.8 PRINT

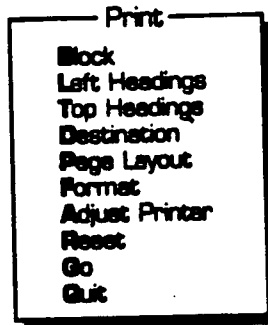The contents of the PRINT sub-menu are shown in Fig. 8.

Fig. 8: The Print Menu

Print command is used to print the spreadsheet.

3.3.9 LAYOUT

The sub-menu contains commands to change the "look" of the spreadsheet.

3.3.10 DEFAULT

The menu contains instructions to change the "default settings" of QUATTRO.

3.3.11 ADVANCED

The menu contains commands used in "database management," statistical analyses, inversion and multiplication of matrices.

3.3.12 QUIT

This command gets you out of QUATTRO. You will return to MS-DOS. Prior to issuing this command do not forget to save your spread- sheet. The contents of the spreadsheet will be irrecoverably lost!

4. A DEMONSTRATION PROBLEM

This problem is taken from <u>User's Guide to QUATTRO</u>. Fig. 9 contains the basic information that will be entered for this spreadsheet. Enter this information in the sequence described below.

Fig. 9: The Example Spreadsheet

4.1 Entering the Headings

1. Enter EXPENSE REPORT FOR ALLISON SPRINGS in cell B3.

2. Enter WEEK ENDING JUNE 27, 1987 in cell B4.

3. Enter DAY OF WEEK in cell A6.

4. Enter ^DATE in cell B6.
   (^ character will center the label in the cell.)

5. Enter ^LOCATION, ^TRANSPORT, ^HOTEL, ^ENTERTAIN, and ^MEALS in cells C6, D6, E6, F6, and G6, respectively.

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6. Enter SUNDAY, MONDAY, TUESDAY, WEDNESDAY, THURSDAY, FRIDAY, and SATURDAY in cells A7, A8, A9, A10, A11, A12, and A13, respectively.
   (Without " ^ " the labels will be left-justified.)

7. Enter TOTAL in cell A15.

4.2 Saving and Retrieving the Spreadsheets

With the above information you have entered the captions of the table. Before going any further it is a good time to practice saving files, erasing the spreadsheet, and retrieving a file. Do the steps described below:

1. Press slash (/) key. The main menu will appear. Move the highlighted area by using cursor keys to File command. Press the RETURN key.

2. FILE sub-menu will appear. Using the cursor keys move the highlight to Save. Press the RETURN key. A list of spreadsheet files in the default directory will be displayed. QUATTRO will also prompt you for a file name, under which your current spread sheet will be saved. Give a unique name. This name must be different from any of the already existing spreadsheet files. PRESS the RETURN key.

3. To be on the safe side, press the ESCAPE key a couple of times, until you are back at your original spreadsheet. Issue slash, FILE, SAVE commands. Check if the file you saved is listed as one of the spreadsheet files in your default directory. If it is, then issue a couple of ESCAPE commands, until you are back at the original spreadsheet.

5. Press the slash (/) key, and then issue the ERASE command. Your spreadsheet will be erased.

6. Press the slash (/) key, then issue FILE command, to be followed by RETRIEVE. The spreadsheet files in your default directory will be displayed. By moving the highlighted cell identify the file you just saved. Press the RETURN key. The file you saved will be loaded.

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4.3 Changing Column Widths
You can practice changing the "column widths" by the following
steps. As you can, see the full caption of DAY OF WEEK is not
displayed in it's entirety. We need to increase the column width
for column-A.

1. Press slash (/) to bring in the main menu. Move the
highlighted area down to **COLUMN**. Press the RETURN key.

2. Move the highlight to **Width**, and press the RETURN key.

3. Move the highlighted cell (pointer) to any cell in
Column-A. The software will indicate that Column-A is nine
spaces wide. This is not wide enough to display the full
DAY OF WEEK caption. Change the width to 13 columns. Press
the RETURN key.

4.4 Entering Numeric Data as Labels
Next we will enter the "dates" displayed in column-B, (cells B7
through B13.) We want to treat the dates as "labels." If we
enter the dates as shown, QUATTRO will assume that you are per-
forming an arithmetic operation. Thus, before keying in each
date entry put a single apostrophe, ('). Thus the first date
should be entered as '06/21/1987. However, on the screen the
date will be displayed without the apostrophe.

4.5 Copying
1. Enter SAN DIEGO to cell C7.

2. Cells C8 through C12 will have SAN DIEGO as well.
Rather then repeated entries, we will copy the contents of
cell C7 to cells C8 through C12.

3. Bring up the main menu. Issue BLOCK command. At the
Block sub-menu, issue Copy command.

4. In copying you need to identify the source to be copied
from. Using the cursor keys move the highlight to cell C7.
Press the RETURN key.

5. Move the highlight to cell C8. Press the "period" key. By doing this you have "anchored" the highlighted block. By using the cursor key, pull down the highlighting, to include cell C12. Watch the top of the screen. As you move the highlighted area, the address range indicated will change. When the highlighted area covers from cell C8 through cell C12, press the RETURN key. The contents of cell C8 will be copied to cells C9 through C12.

6. Enter SAN JOSE to cell C13.

7. Enter the numerical values to columns, without using the dollar sign ($) to cells D7 through D13, E7 through E13, F7 through F13, and G7 through G13.

8. Since you have entered quite a bit of information, it is a good idea to save the contents of the spreadsheet. Issue FILE and SAVE commands. **REPLACE** the existing file on your default drive with the spreadsheet you are operating.

4.6 Formulas
You need to find the total amount spent for TRANSPORT. Move the highlight to cell D15. Enter the following formula

    +D7+D8+D9+D10+D11+D12+D13

The above formula will add the contents of the indicated cells. It should be noted that by putting a plus sign (+) before the expression you are informing QUATTRO that what follows is a formula, and not a label. If we have many entries to be added, the above formula will be too laborious.

The summations corresponding to Columns E, F, and G can be done more expeditiously and professionally as follows.

1. Move the highlight to cell E15.

2. Enter the following expression @SUM(

3. By using the arrow keys move the highlight to cell E7.

4. Press the period key (.); you have anchored the block to be defined.

5. By using the arrow keys enlarge the highlighted block to include cell E13. Look at the top of the screen. Your "formula should read: @SUM(E7..E13

6. Enter the close parenthesis sign, ()). The formula at the top should read @SUM(E7..E13).

7. Press the RETURN key. The numerical value of your sum will be displayed in cell E15.

As indicated earlier, QUATTRO has a number of built-in functions. One of them is the summation function we just used. All formulas start with an "at" sign, (@).

8. Copy the contents, i.e. the formula, in cell E15, to cells F15 and G15. The spread sheet will display the numerical values of the summation for each column. However, if you move the highlighted cells from E15 to F15, etc, watch the second line from the bottom. The formulas will be displayed.

9. Inspect the range of formulas at cell E15 vs. F15. The range of the formula used in cell E15 is over column-E, whereas the range of the formula at cell F15 is over column-F. In copying a formula from one cell to another, the software automatically makes the necessary adjustments in the "address range." This characteristic of the spread- sheet software makes the manipulation of the spreadsheets a less laborious one.

4.7 HOME, TAB, SHIFT-TAB, PAGE-UP, PAGE-DOWN
Regardless of where the highlighted cell might be, if you press the HOME key, the pointer (the highlighted cell) will move to cell A1.

If the spreadsheet is wide, it will take a number of screens to display the contents. Note that with default column widths, you can display 8 columns and 20 rows in "one screen." If you press the TAB key, the next screen will be brought up. Try this a

couple of times, and watch the column numbers at the top of the screen. Note that the row numbers do not change. You can press the HOME key to go back to your original screen.

Again press the TAB key a number of times. This time instead of pressing the HOME key, hold the SHIFT key down, and press the TAB key. For each of these actions you will be moving your screen display towards Column-A.

If the spreadsheet is long, i.e. too many rows, press PAGE-DOWN key. You will keep the column numbers the same, but you will be displaying new higher numbered rows. With PAGE-UP key you will be doing just the opposite. By pressing HOME key you will move to cell A1.

We need to create a new column to display the total expenses day-by-day.

1. Move to cell H6, and enter ^TOTAL.

2. Move to cell H7, and enter the formula @SUM(D7..G7). Use the steps described in Section-4.6 of this Guide.

3. Copy the formula to cells H8, H9, H10, H11, H12, and H13 by using the approach described in Section 4.5 of this Guide.

4. Go to cell H15. Enter the formula @SUM(H7..H13). Use the steps described earlier in this subsection.

5. The amount shown will correspond to the total expenses. Actually, in cell H15 you will see a series of asterisks. This indicates that the column width (i.e. Column-H) is too narrow to display the results. By using the technique described in Section 4.3, increase the width of this column.

4.8 Changing the Format
In the spread sheet all entries for the expenses are displayed as integers (If the number is a whole number or zero) or as real numbers (If the number is, for example, 27.55). If we wish to change the format used for these numbers we need to go to the

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Default menu. (Use slash, then activate the DEFAULT command.) At
the sub-menu select FORMATS. At the sub-menu of FORMATS, ac-
tivate DISPLAY. Display sub-menu is shown in Fig. 10.

```
┌──Display Format──┐
│                  │
│ Fixed            │
│ Scientific       │
│ Currency         │
│ , (Financial)    │
│ General          │
│ +/-              │
│ Percent          │
│ Date             │
│ Text (Show Formulas) │
│ Hidden           │
│ Reset            │
│                  │
└──────────────────┘
```
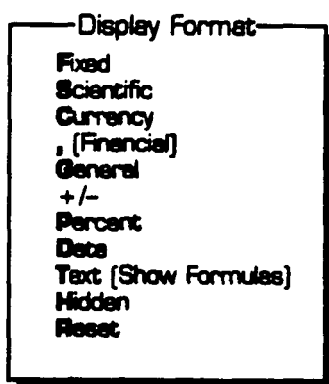
Fig. 10: The Display Format Menu

Choose the CURRENCY option. This is will display two digits
after the decimal point. By this selection, a number like
1234.56 will be displayed as $1,234.56.

4.9 Sprucing-up

To give a more professional look to your spread sheet, you may
wish to put a horizontal line from cell D14 to H14. An ex-
peditious approach for this operation will be to go to cell D14,
and enter \- (backslash followed by a minus sign). Press the
return key. Cell D14 will contain a "horizontal" line. By using
the procedures used in Section 4.5, copy the contents of this
cell to cells E14, F14, G14, and H14.

4.10 Some Experimentation

By now you should have a finished spreadsheet. In this section
we will demonstrate the modifications one can make, and their
ramifications.

1. Go to cell C7, enter BETHLEHEM. You will see that all SAN DIEGO labels listed below will be changed to BETHLEHEM. This action took place because the content of cell C7 was copied to generate cells C8 through C12.

2. Change the contents of cell C7 back to SAN DIEGO.

3. Go to cell D7. Change the amount from 89. to 289. You will see that the total at the bottom of this column, the total of Column-H, as well as the grand total in cell G15 are automatically changed.

4. Change the amount back to 89.

The above experimentation shows a built-in danger of arbitrarily modifying spreadsheets. For example, the contents of cell C7 were copied to the cells below. You may wish to change only one entry, whereas you changed all SAN DIEGO entries. Thus, prior to making any changes, it is absolutely essential that you know the extent of modification, or damage, you will be making by a careless change.

The above experimentation also shows the great ease with which you can make the necessary corrections to the entries. If the mode of operation of the spreadsheet is properly set, then upon the modification of any one cell, all necessary re-calculations are automatically performed.

4.11 **EDIT**
Quite often the entries you have in one or more cells may be quite lengthy, especially in the case of formulas. Rather than re-entering the new contents of the cell you should use the EDIT option. Move the highlight to the cell you want to edit. Press "F2" function key. The contents of the cell will be displayed at the top of the screen. By using arrow, insert, delete, backspace, etc. keys you can edit the contents of the cell. When you are finished, press the RETURN key.

5. GRAPHICS

5.1 GRAPH Sub-Menu
One of the strengths of QUATTRO is its ability to create a wide variety of graphs, customized by the user, using the data entered in the spread sheet. In order to create a graph you need to issue the GRAPH command at main menu. The graph sub-menu, as shown in Fig. 11., will appear. Some of the graphs you can generate are shown in Fig. 12.
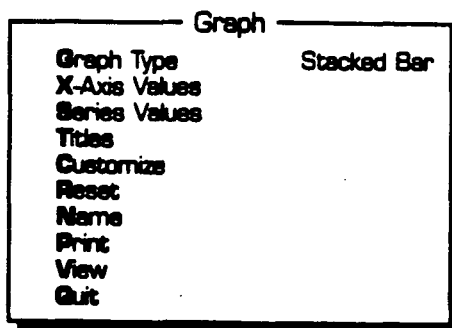
```
┌─────────── Graph ───────────┐
│ Graph Type          Stacked Bar │
│ X-Axis Values                   │
│ Series Values                   │
│ Titles                          │
│ Customize                       │
│ Reset                           │
│ Name                            │
│ Print                           │
│ View                            │
│ Quit                            │
└─────────────────────────────┘
```

Fig. 11: The Graph Menu

The meaning of the commands appearing in the sub-menu are briefly described below:

* Graph Type: There are ten different "types" of graphs; you may select any one of them. The types of graphs that are available are shown in Fig. 13.

* X-Axis values: In graphs that use "x-y" axes, this will be the horizontal axis.

* Series Values: In a given typical "x-y" graph you can plot up to six "curves." The "y-value" for the first curve will be in Series-1, the second curve in Series-2, etc. The sub-menu for the "series values" is shown in Fig. 14.
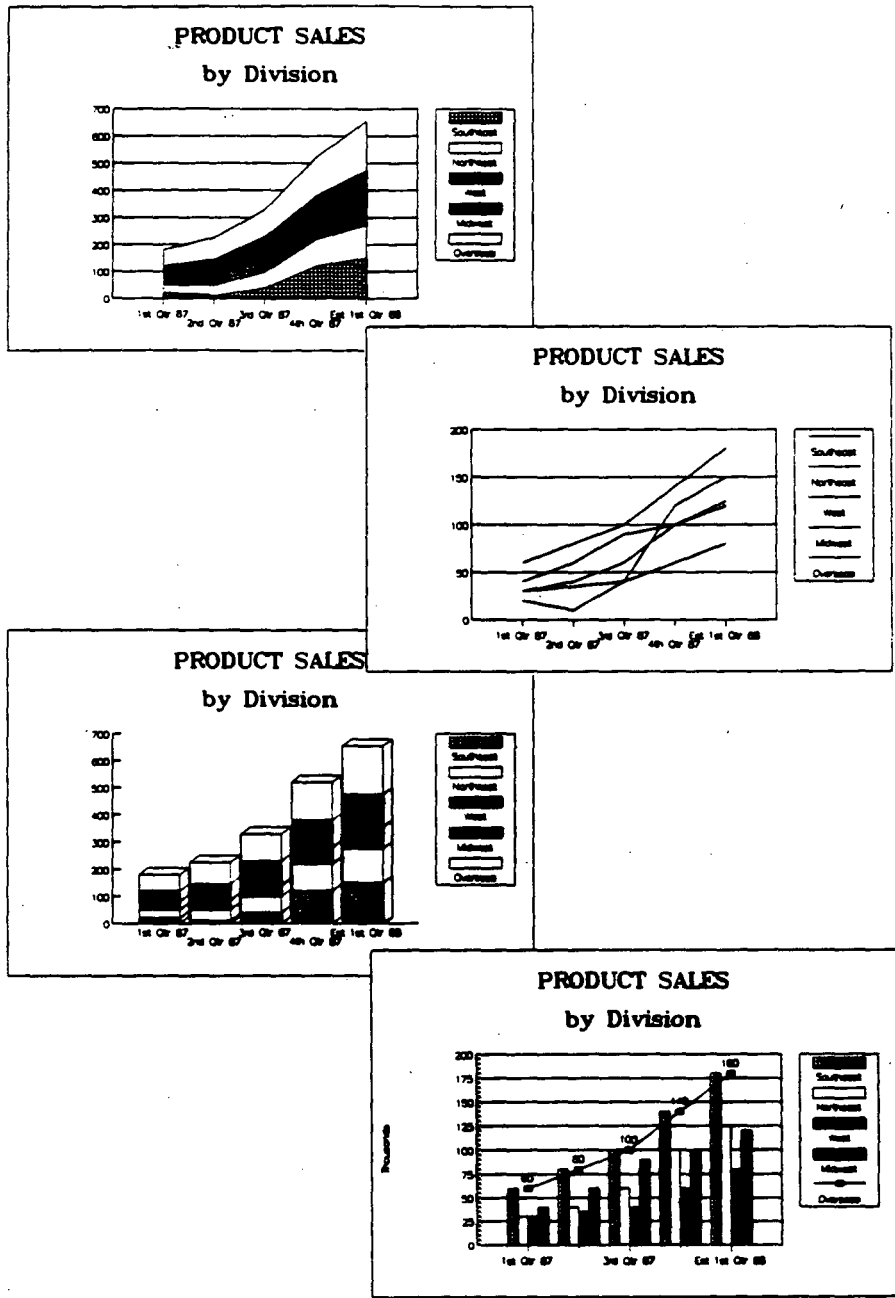
24

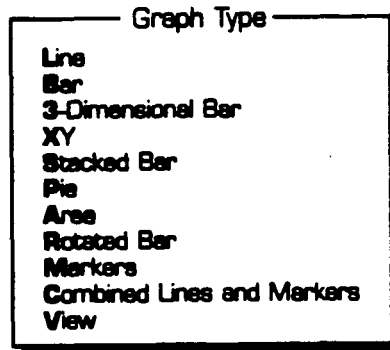Fig. 12: Different Graphs Plotting the Same Information

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```
                  ── Graph Type ──
  ┌──────────────────────────────┐
  │ Line                         │
  │ Bar                          │
  │ 3-Dimensional Bar            │
  │ XY                           │
  │ Stacked Bar                  │
  │ Pie                          │
  │ Area                         │
  │ Rotated Bar                  │
  │ Markers                      │
  │ Combined Lines and Markers   │
  │ View                         │
  └──────────────────────────────┘
```

Fig. 13: The Graph Type Menu

```
  ──Series Values──
  ┌────────────────┐
  │ 1st Series     │
  │ 2nd Series     │
  │ 3rd Series     │
  │ 4th Series     │
  │ 5th Series     │
  │ 6th Series     │
  │ View           │
  │ Quit           │
  └────────────────┘
```
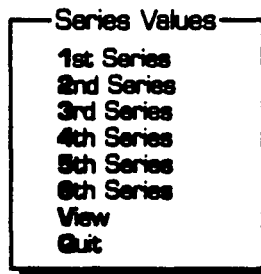
Fig. 14: The Series Values Menu

* Titles: You can have a title and a subtitle for the
    graph. In addition, you will have titles for the "x
    and y" axes. Under the Font sub-menu you will have
    different options, as shown in Fig. 15. Figure 16
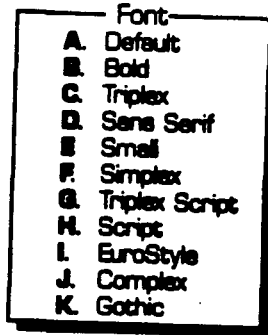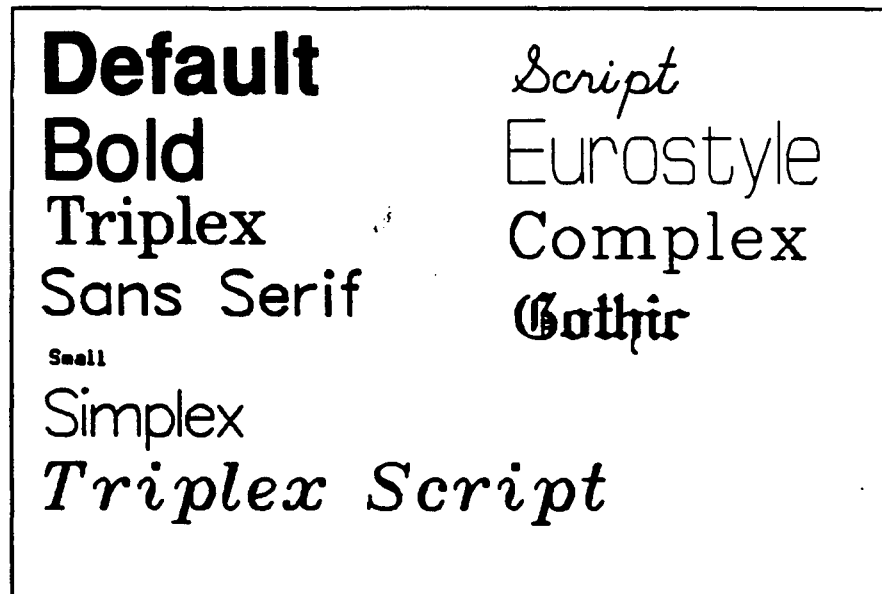   shows the display style of these fonts.

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Fig. 15: The Fonts Menu

Fig. 16: Eleven Available Type Fonts

* Customize: A number of options are available. They are essentially used to "enhance" the graphic presentation.

* Reset: Returns you to the previous "menu settings" of the graph.

* Name: Permits you to store the graph with your spreadsheet file with the name you will assign.

* Print: Issue this command to print your graph.

* View: Displays the current graph on the screen. This command should be frequently issued, as you are modifying or enhancing the graph. To return to the graph menu press ESCAPE key.

* Quit: Returns you to the main menu of QUATTRO.

5.2 An Exercise

In this exercise the total amount of money spent for transportation, hotel, entertainment, and meals will be plotted as a bar chart, as shown in Fig. 17. Issue the Graph command at your main menu. For the X-axis, identify the block consisting of cells D6, E6, F6, and G6. For the 1st series values identify the block containing D15, E15, F17, and G15. Without any enhancements view the graph. If it is satisfactory, then experiment with enhancements of your choice.
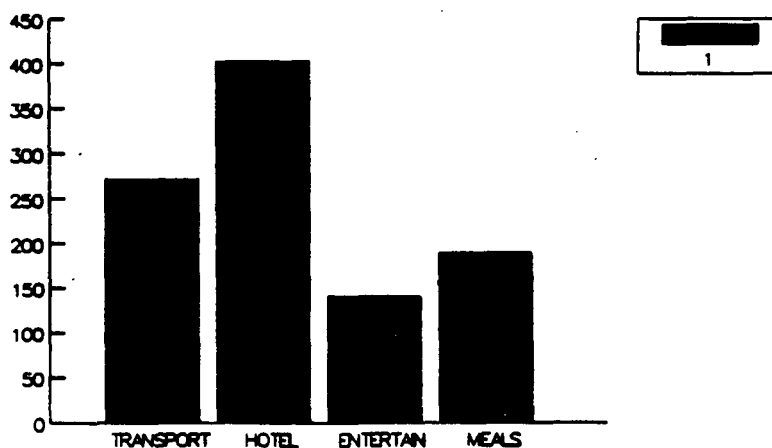
Fig. 17: The Bar Graph of the Exercise Problem

Go back to the graph menu, and change the type of the chart to "Pie Chart." Again view the resulting chart.

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October 1988
FILE:QUATTRO2