



PSION Xchange / PC FOUR

Quill word processor
Abacus spreadsheet
Archive database

Easel business graphics

EASEL

How to use this republished manual

Text in this style is a reproduction of the original manual

Text in bold like this is what is seen or typed in the Computer

Text in this font is taken from Dilwyn Jones and others tips trick and comments

Text in this font are comments from the Author (Martin)

ACKNOWLEDGEMENTS

The text in this republished manual is taken from the QL THOR Xchange manuals distributed by Gunther Strube & Erling Jacobsen on behalf of QUANTA and downloaded from Dilwyn Jones Sinclair QL Pages. Some of the Xchange references and commands are not available in the PC FOUR version but the reader will still find the manual covers the main aspects of the package.

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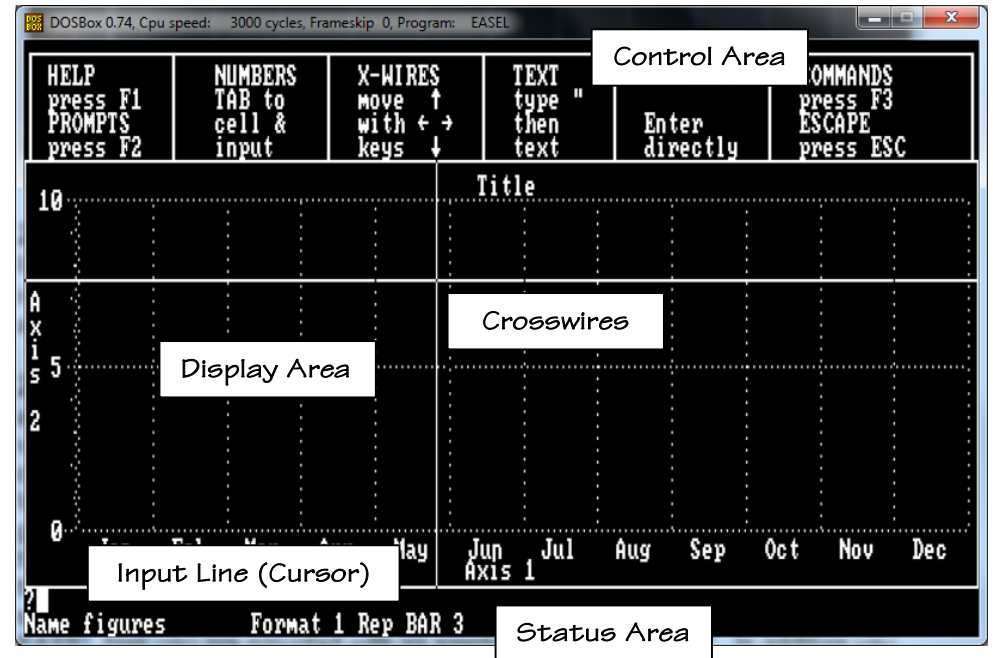
1.0 INTRODUCTION TO EASEL

Easel is a business graphics package with a difference. It is fully interactive, which means that you see the results of everything you do immediately. From the moment you start you can just type in a series of numbers and see them displayed as a graph, as you type them in. You never need to worry about building up tables of values; EASEL takes care of that kind of thing for you, and keeps them where they should be - out of sight. You can add text to the graph just as simply as you enter data and, once it is there, you can edit it or move it around (easily, of course!) until you are satisfied with the result. EASEL is organised in a series of levels and exhibits a pyramidal structure. The top level, which is immediately available when you start, allows you to do the most commonly-needed operations, for example, entering data or text. The full power of EASEL becomes apparent as you become more familiar with it and dig more deeply into the pyramid. Despite this power, EASEL still remains simple to use at all levels. You do not need to remember lots of numbers and since you are guided through each process by a carefully designed sequence of prompts which explain what you can do at each stage. In particular, EASEL has a design by example facility which allows you to select or design anything from a single line or bar to a whole graph, simply by choosing from a set of pictures. With this facility you need never be in any doubt as to what the final appearance of your graph will be. As with other programs, the best way to learn about EASEL is to use it. If you are not sure about something, try a simple example so that you can see how it works.

2.0 USING EASEL

EASEL'S 16 bit graphics software will not run in a Command Window (CMD.EXE). All the examples used in this republished manual use DosBox with EASEL in 80 Column mode - [F3] Design 8 [Enter].

This chapter describes how to use the options immediately available when you have just selected an EASEL task. By the end of the chapter you should be able to produce useful graphs and charts, using EASEL's pre-defined displays. Before going any further, try typing in a few numbers - for example 3, 5, -2 and so on - to see how easy EASEL is to use (don't forget to press [Enter] after each number). See how your graph is displayed straight away, without your having to do anything else. Notice that the scale of the graph adjusts itself automatically to suit the numbers you type in. When you have finished, press function key 3 (F3), then the 'Z' key and finally press [Enter]. You have used the Zap command to erase all the numbers you typed in, leaving your EASEL task in the state it was in when it had just been selected.



2.1 APPEARANCE When you have loaded EASEL the display should look like this in 80 Column Mode [F3] Design 8 [Enter]. The display is divided into three main areas, known as the status area, the display area and the control area.

2.2. THE STATUS AREA The status area uses the bottom of the screen and tells you about the current state of EASEL. The format tells you how the values you type in will be shown. There are eight different display formats to choose from, pre-defined to give an assortment of bar, line and pie chart displays. When you have just selected an EASEL task the format is set to give you a bar graph display (format 1). You are also told the name of the current figures. This is the name given to the set of data for your graph. If you have more than one graph there will be a named set of figures for each graph. the current set of figures is the set that is changed when you type in numbers. When you have just selected an EASEL task you are provided with an empty set called "figures". In addition you are told the format number and the style (eg a bar or line number) that you are using to represent your current set of figures. EASEL can show a given set of figures in one of several different representations - as bars, a line, or in a 3-D bar graph or a pie chart. EASEL initially selects a bar graph representation and uses bar number 0. The final piece of information in the status area is the name of the task - ie the name you gave the task when you selected it.

2.3 THE INPUT LINE Just above the status area is a line that starts with a question mark. It is known as the input line, and is where anything that you type at the keyboard will appear. You should always indicate the end of your typed input by pressing [Enter]. In many of the commands, EASEL will place suggested input in this line. You may accept this input by just pressing [Enter], or you may type in your own input which will replace that suggested by EASEL.

2.4 THE DISPLAY AREA The display area is, as its name suggests, where all graphs produced by EASEL are shown. When you have just loaded EASEL, there is an empty bar graph in the display area. The graph is marked with a grid of horizontal and vertical lines. The horizontal lines correspond to the values shown on the vertical axis (called 'Axis 2') and the vertical lines divide the graph into cells. Each cell marks the position where one value of a set of figures will be plotted. Each cell has a cell label, along the horizontal axis (called 'Axis 1'). EASEL automatically supplies the text "Jan", "Feb" and so on, up to "Dec" for these labels. You can change the text to anything you want. Think of each set of figures as a row of cells, each containing one of the values to be plotted. EASEL keeps the values separate from the way in which they are displayed, and can therefore show any set of figures in the representation you want.

2.5 THE CONTROL AREA The control area shows the normal options to obtain Help [F1], to turn the prompts on and off [F2], to select a command [F3] and to freeze the current task and return to Xchange [F6]. In addition, there are four options that are specific to EASEL. These are to:

- move the crosswires
- type in a number
- type in text
- type in a formula

2.6 THE CROSSWIRES Press the right cursor key and hold it down briefly. You will see a vertical line moving across the screen, from left to right. This is the vertical crosswire. The left and right cursor keys move it across the screen. Now press the up cursor key. This moves the horizontal crosswire up the screen. You can indicate any point in the display area by moving the intersection of the crosswires to that point. In addition, the vertical crosswire marks the position in the graph where a number that you type in will be plotted. If the crosswires are not visible you can display them by pressing the cursor keys; press either the left or the right Cursor key to display the vertical crosswire, and either the up or down cursor key to show the horizontal crosswire. Once both crosswires are visible you can move them around the display area by means of the cursor keys. If you press a cursor key and release it immediately the crosswire will move a short distance in the appropriate direction, but if you hold the key down the crosswire will move more rapidly across the display area.

2.7 ENTERING NUMBERS Type in a number (and then press [Enter]). EASEL displays it immediately on the graph, at the current position of the vertical crosswire. The crosswire will move one cell to the right ready for the next number. Each time you type in a number that exceeds the range of values shown along the vertical axis, EASEL will redraw the graph with a scale that allows the new value to be shown. If you press the [TAB], you will find that each press of the key makes the vertical crosswire move to the right by one cell. Press [Shift] and, while holding it down, press [TAB]. This time the vertical crosswire moves left by one cell. The position of the vertical crosswire marks the current cell - the cell that will show the next number you type in. If you put an incorrect value into your graph you can correct it by moving the vertical crosswire to the cell where the mistake appears and typing in the correct value. If you spot a mistake before you press [Enter] you can correct it by using the line editor. Alternatively you can cancel the number by pressing [Esc] and then typing in the correct value. Whether you move the crosswire with [TAB] or with the cursor keys, the next value you type in will always be shown in the cell containing the vertical crosswire.

2.8 EXPRESSIONS You can type in an expression, for example: $\sin(\pi/2) + 0.5$ [Enter] instead of a number. The expression may include numbers and any of the functions listed in the EASEL Reference. EASEL calculates the value of the expression and puts this value into the cell. If, as in this example, the expression does not start with a numeric digit then the prompt will change to formula instead of value.

2.9 ENTERING TEXT You can add text to your graph by typing a single or double quotation mark as the first character of your input. The crosswires will appear (if they were not already visible) and any following text that you type in will be written in the display area starting at the intersection of the crosswires - and in the input line. When you have typed in your text, press [Enter]. If the text is not in the exact position you want, move it using the cursor keys. The crosswires will move across the screen, carrying the text with them. When the text is in the position you want, press [Enter]. EASEL will automatically switch off the crosswires. Section 2.15 includes an explanation of how you can edit, move or delete existing text.

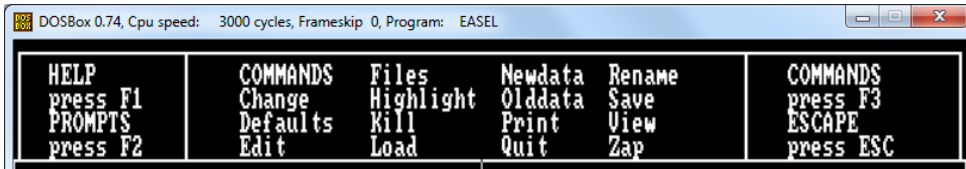
2.10 ENTERING FORMULAS A formula can be used to create a new set of figures, as described in Section 3 - or to change an existing set. EASEL interprets any keyboard input that does not start with a numeric digit or quotation marks as a formula. For example, we can change the current set of figures (which, as you can see from the status area, has the name "figures").

figures = figures + 2 [Enter]

The new graph is similar to the old one, except that each value has been increased by 2. If you want to return to the original graph you can type in another formula:

figures = figures - 2 [Enter]

A formula always starts with the name of a set of figures. This name could be the name of an existing set or it could be a new name. In either case the contents of that data set is defined by the expression to the right of the equals sign in the formula. It is important to realise that the formula will affect all the values in the set, rather than just one value.

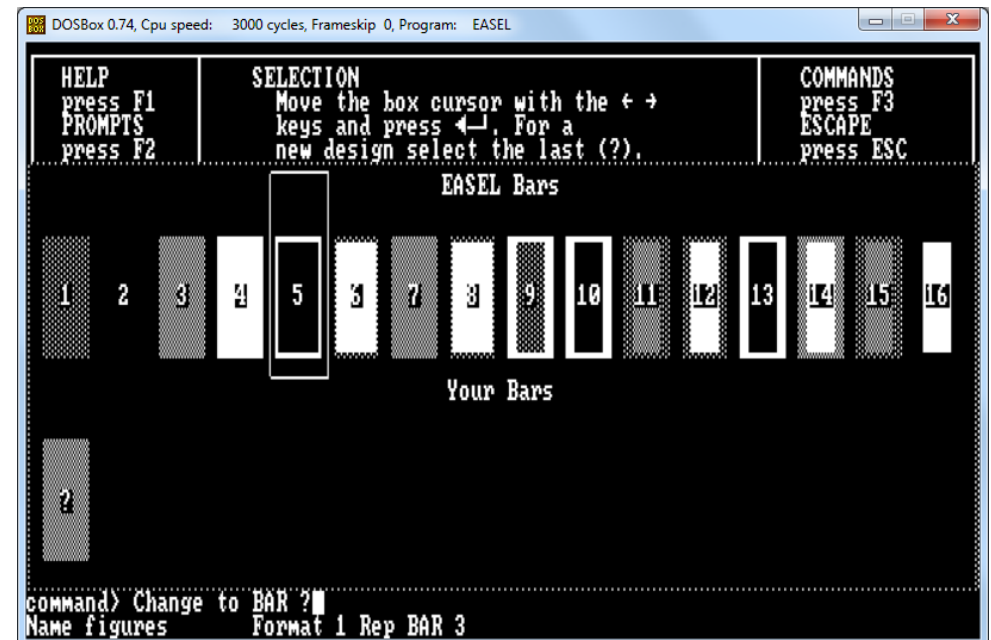


2.11 THE COMMANDS See Section 6.4 for details of each command. The commands allow you to use some of the more sophisticated aspects of EASEL. Press [F3] to select a command. The contents of the control area will change to show a list of the available commands - the command menu. When the command menu is displayed you can select a command by typing in its first letter. For example, the command to discard the current EASEL task and return to DOS is **Quit**. You can select it by pressing [F3] and then 'Q'. EASEL will give you the option to press the [Esc] to stay in EASEL (in case you selected the command by mistake). If you decide you really do want to discard the task, you press [Enter]. Remember that you can freeze the current EASEL task and return to Xchange by pressing [F6]. You cannot type in a number to a cell or type in a formula when the command menu is visible. Also, you cannot move the crosswires, except when given this option as part of the command. In general, at the end of a command, EASEL remains in the command menu and you must press [Esc] to go back to the main display.

2.12 DELETING A VALUE You can delete a value from the graph with the aid of the [F4]. Use the [TAB] key (or the [Shift] and [TAB] keys) to position the vertical crosswire on the number you want to rub out and then press [F4]. If your graph is showing more than one set of figures, pressing [F4] deletes all values shown in that cell. It has no effect on sets of figures that are not shown. If you delete the values from a cell that has no label, then that cell will not be included in the graph when it is next redrawn. EASEL will only delete the whole cell if it has no label and contains no values. If you want to delete an entire cell you should delete its contents and also any label that it has (See section 2.15.3 on cell labels). EASEL will delete all empty, unlabelled cells the next time the graph is redrawn, either by pressing the [F10] key or by using the view command (ie pressing [F3], selecting the view command by pressing the **V** key and pressing [Enter]). As we shall see later, you use [F4] to delete several types of object from your graph.

2.13 INSERTING A VALUE You can insert a new value to the right of the one marked by the vertical crosswire (in the case of line graphs and bar charts) by pressing [F5]. A gap is opened up, ready for you to type in a new number. The new cell will have no label, but you can add one at a later stage. Keep pressing the [TAB] key if you want to add more empty cells at the right side of the graph. An extra set of cells is added each time the vertical crosswire reaches the edge of the screen. Use [Shift] and [TAB] in a similar way to add cells at the left of the graph. Again, all unused cells are automatically removed from the graph when the graph is next redrawn.

2.14 BAR DESIGN The previous sections explained the basic methods for producing a bar graph of your data, and how to add text. At this stage, EASEL decides the way your graph will appear. This section shows how you can modify the appearance of your graph by using a different design bar. You have great flexibility in changing the appearance of a graph, ranging from changing the appearance of a single value - to make it stand out in the display - to designing a completely new display format with a new graph paper, axis markings and type of representation for all figures in the graph. You will find out about these possibilities later. In this section we shall concentrate on how to modify the appearance of the bars in the graph. All the options to modify the various features of the graph work in the same way. Learning how to change your graph to use a new bar design explains the methods you will use to change any other aspect of the graph. We assume that you have typed in a few numbers and have a bar graph shown on the screen.



2.14.1 SELECTING A BAR You use the Change command to select a different bar for your graph. Select the command by pressing [F3] and then the C key. You are offered many options - to change to a Line graph, to modify an Axis, and so on. Select the Bar option by pressing the B key. There are two main routes to using a new style of bar - selection by number or selection by example.

2.14.2 SELECTION BY NUMBER When you have selected the Bar option of the Change command the input line shows the text:

COMMAND> Change to Bar?

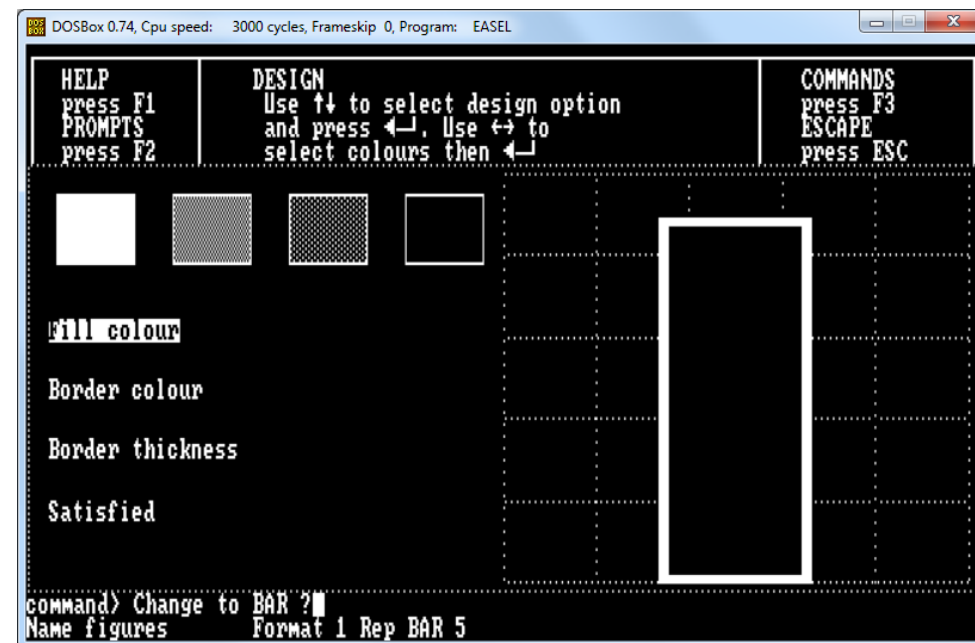
and EASEL waits for you to type in a number. There are 16 different bars and you can select any one of them by typing its number, followed by pressing [Enter]. Try using the Bar option of Change to show your graph with several different bar designs. This is a very quick method of changing the bar you use, provided you know the number of the one you want.

2.14.3 SELECTION BY EXAMPLE In many cases you may not know the number of the bar that you want to use, or you might want to use your own design. In such a case you can take advantage of the ability to select or design a bar by example. You select this option by pressing [Enter] when EASEL is waiting for you to type in a bar number. Try this method of selecting a bar by typing in: [F3] C B [Enter] (You do not have to press [F3] if you are still in the command menu, after using a previous command). The display changes to show examples of all the available bar styles, together with their associated numbers. This is shown on page 8. The fifth bar in the display is surrounded by a box which indicates that this is the bar that will be selected for use if you press [Enter]. You use the left and right cursor keys to move this box from bar to bar until it is positioned on the one you want. When you press [Enter] the bar you have chosen will be used in the display of the current set of figures.

2.14.4 DESIGNING A BAR When you use the option to select a bar by example you will notice that there is one bar present in the second row, which shows a question mark in place of its number. select this bar if you want to make your own design, instead of using one of the pre-defined styles. To see how this works, position the selection box on this bar and press [Enter]. EASEL presents you with a bar design and a list of options, as illustrated on page 10.

2.14.5 BAR COLOUR The first option, which is highlighted, is to choose a colour for the body of the bar. You have the choice of either moving to another option, by means of the up and down cursor keys, or of selecting the currently highlighted option by pressing [Enter]. If you accept the fill colour option, a box is drawn around the first colour in the palette and the specimen bar is filled with that colour. You can move from colour to colour by pressing the left and right cursor keys. Make your selection by pressing [Enter] when the bar is filled with the colour you

want. EASEL always draws the bar against a background of the current graph paper.



PC-FOUR EASEL in 80 column mode displays colours in MONO 4 shades of grey as shown above - Change Bar Design.

2.14.6 BORDER COLOUR The next option in the list, to select a border colour for the bar is then highlighted automatically. Again you can either select this option by pressing [Enter], or move onto one of the other options, with the up and down cursor keys. If you select this option you can choose the border colour for the bar in the same way as you chose the main fill colour. (If the width of the border is currently set to zero you will not, of course, see the border colour in your bar design). Again you should press [Enter] when you are satisfied with the result.

2.14.7 BORDER THICKNESS The third option is to select the width of the border and, as with all options, you can select it by pressing [Enter] when the option is highlighted. In this case you are asked to type in a number to represent the width of the border, as a percentage of half the width of the bar - eg if you type in the number 50 and press [Enter], the border will extend half way to the centre of the bar. You are finally given the option of deciding whether you are satisfied with the design as shown. If you are you should press [Enter]. The new design will be added to the list of bar designs and it will automatically be used for display of the current set of figures. If you are not satisfied with the design you can go back to one of the other options, using the up and down cursor keys, and try a new

combination. At any time before you accept the design you can terminate the command by pressing [Esc]. This will cause you to leave the command without creating a new bar design.

2.14.8 DELETING A BAR DESIGN You can delete any of your own bar designs from within the bar design option. When the bars are shown on the screen, press the left or right cursor keys to select the bar you want to delete and then press [F4]. Note that you may only delete those bars that you have designed yourself, not the designs that EASEL supplies. If the deleted bar was being used in the representation of any of your graphs, EASEL will replace it by one of the other existing bar designs. You may delete any other user-defined object - eg a line or an axis - in a similar manner.

2.15 USING TEXT In section 2.9 we described how you can add text at any point in the display. In this section we shall describe how you can edit existing text, or move it to another point in the display. In addition we shall describe the changes you can make to the axis names and the title graph. Each time you edit some text, or add new text, it is shown in the direction - horizontal or vertical - that you last set with the Text-direction option of the Change command, as described later in this section. EASEL recognises three basic types of text:

- Ordinary text (including the Title)
- Axis Names
- Cell Labels

The Edit command has the option to edit the three types of text listed above, and a fourth option relating to the key. The key option is only relevant when you have more than one set of figures in your graph. It is described in the next section.

2.15.1 ORDINARY TEXT Ordinary text - ie all text except for the axis names and cell labels - behaves as though it were pasted on the screen. It is always printed over the top of the graph or chart. It remains on the screen until you delete it, regardless of any other changes you make. Press **[F3] E T** to select the Text option of the Edit command. As indicated in the control area, you then use the cursor keys to move the intersection of the crosswires close to the text which you want to change. It is not necessary to position the crosswires exactly on the start of the text. When you have positioned the crosswires you should press [Enter] and the crosswires will attach themselves to the nearest piece of text. A copy of the text also appears in the input line. Then you have two choices, which are to:

- delete the text by pressing [F4] - After deleting the text, EASEL returns to the command menu.
- modify the text with the aid of the line editor When you are completely satisfied with the wording of the text you should press the [Enter] key. EASEL

then gives you the opportunity to use the cursor keys to reposition the text. Press [Enter] when you are satisfied with the position.

EASEL treats a graph title in the same way as any other text. The only difference is that EASEL supplies the text "title", centred above the graph, when you have just selected an EASEL task.

2.15.2 AXIS NAMES Axis names only appear on bar and line graphs. Any text used as an axis name is not shown when you select a pie chart representation. Select the Axis option of the Edit command to edit either of the two axis names: **[F3] E A**. Press **V** or **H** to select the vertical or horizontal axis name. You can then edit, delete or move the text, as described for the text option. The text of the vertical axis is always drawn in a vertical direction and the horizontal axis name is always drawn horizontally.

2.15.3 CELL LABELS The cells of the graph are provided with labels which are initially set to show the months from January to December. EASEL usually shows these labels along the horizontal axis of a bar or line graph. You use the Labels option of the Edit command to change the cell labels. Select the option by pressing: **[F3] E L**. When you do so the crosswires will attach themselves to the nearest label. This label will then be displayed in full (if the labels are long, normally only the first few characters are shown, depending on the width of the cells). The text is also copied into the input line. You can then delete the label by pressing [F4], or edit it with the line editor, described in section 2.3. Press [Enter] to finish editing the label. You cannot move a cell label; if, for example, you attach the crosswires to a label and then move them, the label will not move.

2.15.4 TEXT DIRECTION Use the Text-direction option of the Change command to select whether ordinary text is vertical or horizontal. Select the option by pressing: **[F3] C T**. If the current text direction is horizontal, selecting this option will switch to vertical text. Selecting the option again will change the text direction back to being horizontal. Existing text retains its own direction but EASEL uses the new direction for all new text that you add to the graph - and for any old text that you edit. A convenient way of changing the direction of existing text is first to use the Text option of Change, as described above, and then to use the Edit command on the existing text, without actually changing its wording or position. Note that you may only change the direction of ordinary text - you cannot affect the direction of the cell labels or the axis names.

3.0 SEVERAL SETS OF FIGURES So far we have only described how to create and display a single set of figures. On many occasions you may want to display two or more sets of data on the same graph, for example to compare the sales figures for two successive years. This chapter describes the techniques you can use to produce, modify and display graphs containing several sets of figures. Each set of figures has a name which you use to refer to them. When you have just selected an EASEL task, you have one set of figures. EASEL gives this set the name "figures" and shows the name in the status area.

3.1 THE CURRENT FIGURES No matter how many sets of figures you have in your graph, you can only modify one set at a time. The set that you can add or change is known as the current figures, and its name is shown in the status area. It is not necessary shown on the screen but will, however, always be shown when you are actually making any changes to it.

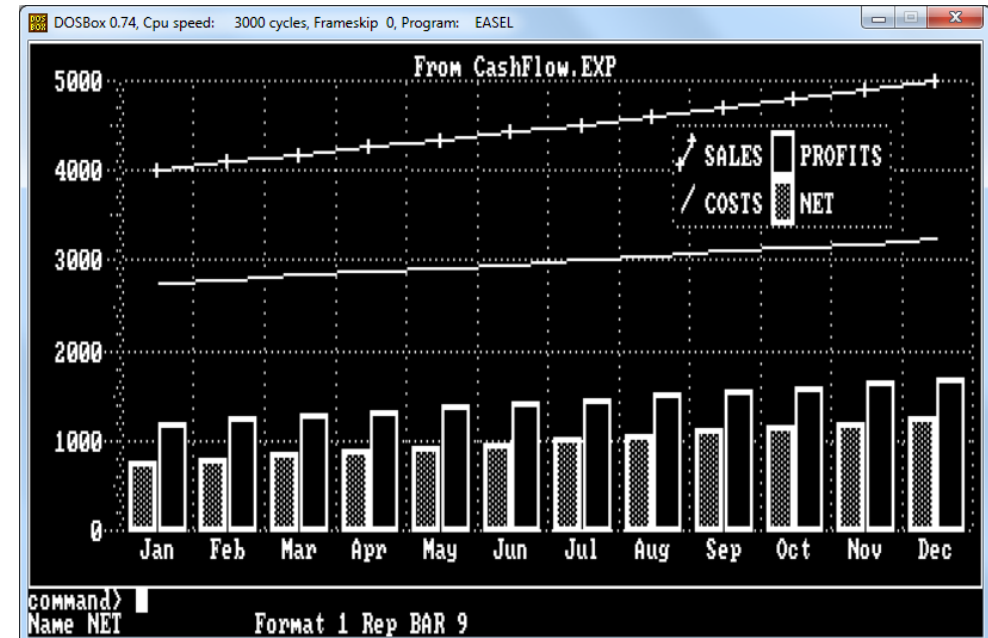
3.2 THE RENAME COMMAND Suppose that you have typed in a set of numbers to 'figures' and want to change the name to 'sales'. You do this with the Rename command. Press [F3] and then the R key to select this command. EASEL waits for you to specify which set of figures you wish to rename. If you want to rename current set, just press [Enter] to accept EASEL's suggestion. If you want to rename another set of figures, you must type in its existing name in full, then [Enter]. EASEL then asks you to type in the new name for the set of figures and you must again press [Enter] at the end of the name. To change the name the current set to the new name "sales", you should type: **[F3] R [Enter] sales [Enter]** The set of figures that you have renamed always becomes the current figures.

3.3 THE NEWDATA COMMAND There are two methods that you can use to produce new subsequent sets of figures. These are by using the Newdata command, or by using a formula. The two methods are described in this and the following section. Suppose you have created a set of figures called "sales", as described above, containing monthly sales figures, and that you now want to include a display of the monthly costs. You can do this by pressing [F3] and then the N key, to select the Newdata command. EASEL then asks you for the name to be given to the new set of figures. You then type in the name, ending by pressing [Enter]. To create a new set of figures called "costs" you would therefore type **[F3] N costs [Enter]** EASEL immediately gives you a new blank graph (assuming you are in a bar or a line format) with the vertical crosswire set on the first column, ready for typing in the new set of numbers. The status area shows that the current figures are the new set, with the name "costs". All you have to do is type in the new numbers which are immediately displayed on the graph as normal. If you want to create a third set of figures, you can use the Newdata command again, exactly as has been described, giving the new set of figures a different name. You can create as many sets as you like, the only limit is the amount of computer memory that you have available.

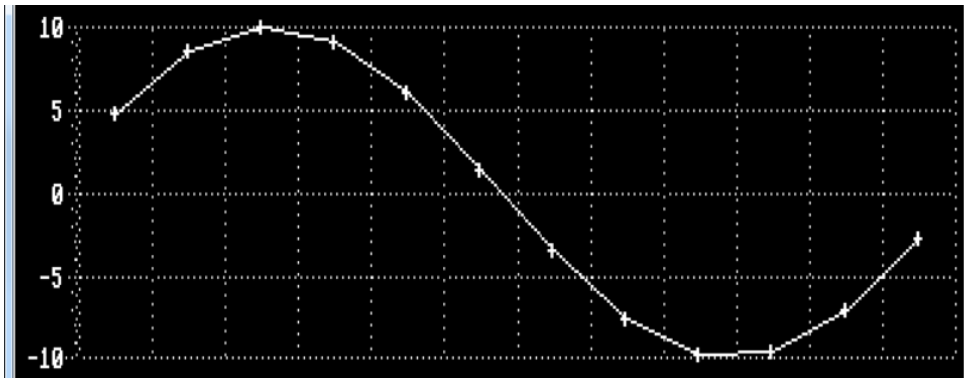
3.4 A Worked Example (Examples.zip - IECshFlw.aba)

	Jan	Feb	Mar	Apr	May	Jun	Jul
1CashFlow							
2SALES	£4000.00	£4080.00	£4161.60	£4244.83	£4329.73	£4416.32	£4504.65
3COSTS	£2750.00	£2790.00	£2830.80	£2872.42	£2914.86	£2958.16	£3002.32
4PROFITS	£1250.00	£1290.00	£1330.80	£1372.42	£1414.86	£1458.16	£1502.32
5 wages	700	700	700	700	700	700	700
6 advert	100	100	100	100	100	100	100
7 rent	200	200	200	200	200	200	200
8 elec	50	50	50	50	50	50	50
9 dep	90	90	90	90	90	90	90
10Expenses	440	440	440	440	440	440	440
11NET	810	850	890.8	932.416	974.8643	1018.162	1062.325

Reformatting the data used in the Abacus Manual example CashFlow into IECshFlw.aba - Save then - Export as CashFlow.exp and Import into Easel and change bars and line. View the Sales, Costs, Profits and Net to show the example below.



3.5 USING A FORMULA The Newdata command is useful for defining completely new sets of figures, but on many occasions you may want to produce a new set that is related in some way to one or more existing sets. You may, for example, have already entered sets of figures for sales and costs, and then want to include a set of figures which represent the resulting profits. Rather than calculate the profit figures yourself and then enter them by means of the Newdata command, you can use a formula and let EASEL do the work for you. All you have to do is type in the formula which describes the new set of figures that you want, for example: profits = sales - costs This creates a new set of figures with the name "profits", each value being the difference between the corresponding values of the sales and costs figures. The "profits" graph will be displayed immediately, and becomes the current figures. You can easily produce a result like that on page 14. When you use a formula in this way you will normally have an equal number of values in each of the sets of figures referred to in the formula. This, however, is not essential; EASEL will calculate and display all possible values, even if the sets of figures contain different numbers of values. You can also use a formula without having to refer to existing sets of figures.



You could, for example, write a formula such as **wave = 10 * sin(cell/2)** This formula creates and displays a new set of figures with the name "wave", whose values are calculated using the sin() function. In this formula we have also used 'cell'. This provides a value which is the cell number, counting up from 1 at the left hand side of the graph. To see how this works, type in the formula: a = cell and look at the graph that is drawn. When you use 'cell' in a formula, the number of values in the set of figures is made equal to the number of columns currently being shown on the graph. There is another reserved word in EASEL - 'cellmax'. It has a value equal to the number of cells currently shown on the screen. You can use 'cellmax' to adjust the scale of the horizontal axis in a formula. For example, the formula: **curve = sin(2 * pi() * (cell - 1)/(cellmax - 1))** draws one complete cycle of a sine curve, regardless of how many cells are shown on the screen.

3.6 THE OLDDATA COMMAND When you use the Newdata command the set of figures that you create becomes the current figures. Remember that this is the set that can be added to or changed by typing in numbers. If you want to make some changes to an existing set of figures that is not the current set, you can do so by using the Olddata command. When you select this command you are asked to type in the name of a set of figures. In this case the name you type in must be the name of an existing set, and that set becomes the current figures. Suppose that you have the three sets of figures called "sales", "costs" and "profits", and that "profits" is the current set of figures. If you want to change or add to the "costs" figures you should select it with the Olddata command. The costs figures will then be shown on the graph and you can modify the data by typing in replacement numbers as described in Section 2.7. Note that any change you make in the "costs" figures will not automatically change the "profits" graph. (This is a job for ABACUS.)

3.7 VIEWING THE DATA You can see the effect of displaying all of your figures on a single graph by means of the View command. Try selecting this command (by pressing [F3] and then the **V** key). As you can see, EASEL suggests that all the sets of figures should be shown on the graph and you can accept this suggestion by pressing [Enter]. EASEL then suggests the display format to be used and again you can accept the suggestion by pressing [Enter]. The graph is drawn immediately, containing all the data that you have defined - together with a key box which shows the name of each set of figures and the way that it is represented (the key is not shown if you only have one set of figures on the graph). You can move the key if it is not in a convenient position, using the Key option of the Edit command, which is described in the next section. If you have defined a large number of sets of figures the graph will be very crowded and will make little sense. In general it is a good idea to display only a small number of sets of figures on any one graph to make the best visual impact. This does not mean that you should only define a small number of sets of figures, since the View command allows you to select the sets of figures that you want to see. You do this by not accepting the "all Figures" suggestion that EASEL gives in the View command. Instead of just pressing [Enter] at this point, you can type in a list of the names of those sets of figures which you want to be displayed, separating the items in the list by commas. When you have typed in all the names of the sets of figures that you want to be displayed, press [Enter]. You may also select a different format for the display instead of accepting the suggestion made by EASEL. Instead of just pressing [Enter] to accept the suggested format you can type in a number between 1 and 7. EASEL is provided with eight pre-defined formats numbered 1 to 8, providing various styles of bar charts, lines or pie chart. Format 8, the pie chart, can only display one set of figures (the current set) at a time. You can, instead of typing in a number, type in a question mark to see a menu of all possible formats. Try using the View command to display three or four sets of figures in a number of the different formats available. Section 5 will describe how you can design your own graph format. Note that the View command will show only those cells which contain at least one value, or have a cell label. Suppose

you want a graph containing only a few cells. Use [F4] to delete any values from the cells you do not want to include. Delete their cell labels by using [F4] in the Labels option of the Edit command. When you next use the View command, the resulting graph will include only those cells you want.

3.8 THE KEY BOX When your graph shows two or more sets of figures it will include a key box. Within this box is the name and the corresponding representation for each set of figures. You can reposition or erase the key box if you so wish. Note that the key box will not be shown if it would be larger than the display area. One of the options in the Edit command is to move the key. If you select this option the key is replaced by its outline, and you are offered the option of either deleting the key - by pressing [F4] - or moving the key by means of the cursor keys. If you choose the move option the cursor keys move a box equal in size to the key around the display area. When you finally press [Enter] the graph will be redrawn with the key in its new position. You may at some time want to restore the display of a key which you had deleted earlier. You can do this by using the Edit command and selecting the Key option. The outline of the key will appear. You may, if you want, move the key to a new location. Whether you move the key or not, pressing [Enter] will cause the graph to be redrawn, including a display of the key.

4.0 PERMANENT COPIES In addition to saving your graphs in disk files you will, at some time, need to make a permanent copy with the Print command or you can take a photograph of the screen.

4.1. PRINTING If you have a printer you can make printed copies of your graphs. The Print command simply makes a printed copy of the graph currently shown on the screen. It also allows you to save the screen contents to a disk file, so that you can load it into another program for further processing, etc. Select the command by pressing [F3] and then the P key. Press the P key again to select an immediate print-out, or press the S key to select the Screen dump option, to save the screen contents in a disk file. If you select P for immediate print-out, EASEL will load a graphics printer driver, by default called gprint.prt, from the help drive. The supplied version of gprint.prt, which will work with Epson or IBM Proprinter compatible printers, will send a screen-dump to the device currently set as SPL_USE device. It can be configured, using QJUMP "config", to use another (fixed) device. If you do not have ToolKit II, this would be necessary. Note that there is a large amount of information to be

Printing from EASEL running in DosBox requires it to be configured to direct the printout to LPT1 or similar. As DosBox was primarily designed for running legacy DOS based games the config file doesn't have a [printer] section.

Experienced users may experiment by using the printer driver creator PEDIT outlined in Appendix B.

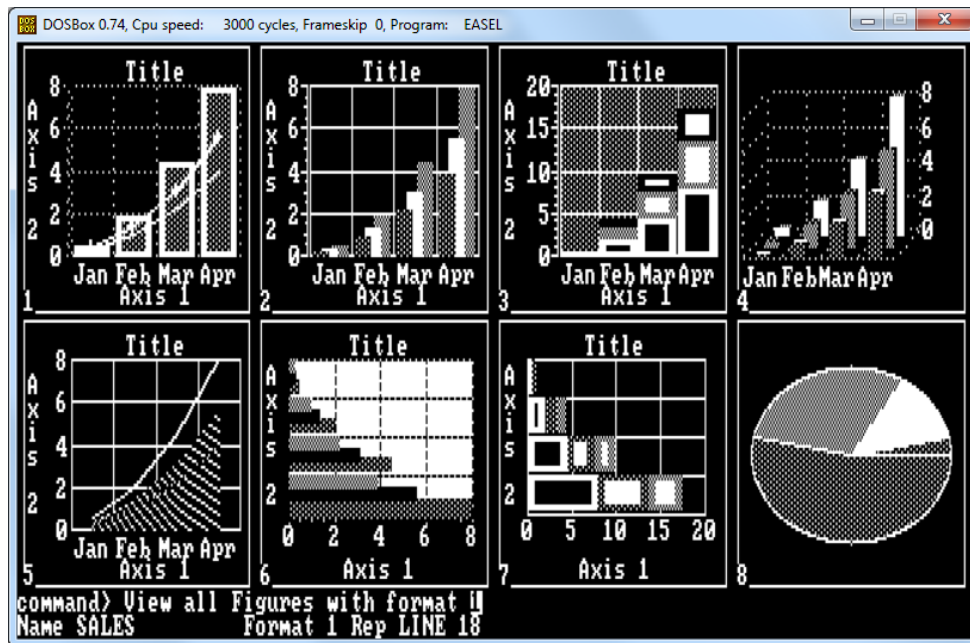
sent to the printer, so it may take several minutes to print the graph. If you select S for screen dump to a file, EASEL asks you to type in the name for the file. Press [Enter] after you have typed in the name. The default extension of the file name is .pic. This extension, as well as .scr, will cause a 32 kilobytes file to be saved, containing the raw data from the screen. By using the extension .cut, the screen will be saved in a format ready to be loaded into modern graphics programs, such as QDesign. This format consists of a 10-byte header, followed by the 32 kilobytes of data from the screen. Using any other extension, will cause the header to be modified slightly. Use this only if the .cut format is not suitable.

4.2 PHOTOGRAPHY The simplest, and fastest, way of obtaining a permanent copy of one of your graphs is to take a photograph of the screen. You must, however, take a little care if you want to obtain good results. One of the most common causes of a poor photograph of a television screen is using too short an exposure time. The picture is made up of separate lines, displayed one after the other. It takes an appreciable fraction of a second to display all the lines in the picture and if you use too short an exposure time the picture will be unevenly lit. It is best to use an exposure time of around a quarter of a second - this means that you must support the camera on a tripod. An average colour film (for prints or transparencies) with a speed of, say, 100 ASA will need an aperture of around [F4]. Use a long focal length lens (about 100mm) if you have one, as this will reduce the distortion caused by the curved surface of the monitor screen. Try to take a photograph in a darkened room, to avoid reflections of the surroundings from the surface of the screen. It is surprising how strongly such reflections show up on a photograph, even if you do not notice any when you look through the camera viewfinder. Press [F10] to redraw the entire graph, to make sure it contains all the changes you have made. Press [F2] to remove the control area and give you a larger graph. You can also press [F7] to erase the text in the status area. Before taking the picture make sure that all the text, cell labels, axis names and the key appear exactly as you want them.

5.0 GRAPH FORMATS An EASEL graph format determines how your graph will appear. It is a collection of properties of the graph itself, independent of the values that are being shown. EASEL is provided with eight graph formats, each of which is supplied with a unique set of properties when you start an EASEL task. Some of the properties of each format are fixed, but there are many that you can modify yourself. When you start to produce a graph you will normally have a good idea of the effect you want to create. In such a case you would select the format that is closest to your needs and then modify it until it is exactly what you want. The following table lists the fixed properties of each of the eight formats.

Format	Representation	Direction of plotting
1	Bars (side-by-side) + Lines	Vertical
2	Bars (overlapping) + Lines	Vertical
3	Bars (stacked) + Lines	Vertical
4	3-D Bars	Vertical
5	Lines and Bars (side-by-side)	Vertical
6	Bars (overlapping) + Lines	Horizontal
7	Bars (stacked) + Lines	Horizontal
8	Pie Chart	Not applicable

Format 4 is initially set to show all sets of figures as lines. The three types of bar use different ways of representing two or more sets of figures on a single graph. Side-by-side bars show the values in a particular cell as separate bars. Overlapping bars are also shown side-by-side, but each of the bars in a cell slightly overlaps its neighbour. When you use stacked bars, all the bars in a cell are drawn one above the other. The total height is the sum of the heights of the individual bars.



5.1 SELECTING A GRAPH FORMAT You can use the Format option of the Change command to select one of the eight formats. When you press: **[F3] C F** EASEL puts the text: **COMMAND Change to format ?** in the input line and you can select a particular format by typing in a number between 1 and 8

(followed by [Enter]) as for the View command. You also have the option of just pressing [Enter], when EASEL shows you the appearance of all 8 formats. EASEL again asks you for the format number. When you type in a number between 1 and 8, and press [Enter], EASEL draws your graph in the chosen format.

5.2 REDESIGNING A FORMAT You can redesign the appearance of any or all of the eight different formats provided with EASEL. In all formats you are able to change the design of individual bars, lines or pie segments, highlight individual values and change the position and appearance of text. Use the options of the Edit command, as described in Section 6.4.3, to change the text of the cell labels and axis names. remember that you can use the Change command to modify the text and bar styles, as described in earlier chapters. In all of the formats except for format 7 you can alter the appearance of the graph paper and the graph axes with the following options of the Change command.

5.3 GRAPH PAPER The graph-paper option of the change command allows you to select the paper colour and the colour of the grid markings. You can select a graph paper from an existing set of 7 styles, or you can design a new one. The method of design is exactly as described for the Bar option of Change.

5.3.1 AXIS The axis option of the Change command allows you to select the axis style for your graph. You can select an axis from an existing set of 10 styles, or you can design a new one. The method of design is exactly as described for the Bar option of Change. The axis design option allows you to select a colour for the axis line, whether or not the axis line is drawn and the axis limits. EASEL normally chooses the limits for the range of values shown on the vertical axis. It chooses a range that allows you to see all the values in your graphs. If you select the option to change the axis limits you are offered one of three possibilities. Press the **A** key to select automatic limits. In this option EASEL selects a suitable range, depending on the values in your graphs. The range might not include the zero point if, for example, all the values are large and positive. Press the **Z** key to select automatic limits which always include zero. This is the type of axis limits that EASEL uses if you do not make your own choice. Press the **M** key if you want to make your own choice of limits. EASEL asks you to type in the lower limit and then the upper limit (mark the end of each value by pressing [Enter]). Note that EASEL will override your selection if it does not cover the full range of values in your graphs. In all cases the two limits are adjusted so that the intervals in the scale are sensible ones. Note that the specimen axis shown at the right of the screen, does not necessarily show the exact range that will be used in the resulting graph. It is a representative axis and is only intended to illustrate the general type of axis that you have chosen.

5.4 LINE GRAPHS All graph formats except formats 3 and 7 can show sets of figures by line graphs. You may use lines of various thicknesses and colours. You can also use 'filled' lines where the space between the line and the zero level is completely filled with colour. You may find filled lines useful for showing 'critical

values', such as a break-even level as a background to your graph. Since bars and lines are both displayed on the same type of grid, you can mix bars and lines in any combination. Titles, axis labels, general text and the key box all behave in exactly the same way for both bars and lines.

5.4.1 SELECTING A LINE STYLE If you select the line option of the Change command you can change the representation of a set of figures to use a line graph. First make the graph you want to change become the current figures (eg with Olddata). Then select the Line option of the Change command. There are 16 pre-defined line styles and EASEL first asks you to type in the number of the line you want. Type in the number and press [Enter], or just press [Enter] to see the selection available. Select a line by pressing the left or right cursor key. When the box encloses the line you want, press [Enter]. EASEL immediately draws the set of figures with the line style that you have selected. Select the line shown with a question mark instead of a number if you want to design your own style of line. EASEL gives you a list of design options for your line. You use them exactly as was described for the Bar option, in Section 2.14. Press [Enter] to select the highlighted option, or use the up and down cursor keys to step to the option you want.

5.4.1.1 LINE COLOUR selects the line colour. Select the colour with the left and right cursor keys and press [Enter] to move to the next option.

5.4.1.2 SYMBOLS allows you to choose whether to mark each point on the line with a symbol. Each time you select this option the symbols are switched between on and off.

5.4.1.3 FILLED LINES switches between a normal line and a line which is filled with a line colour to the horizontal axis. Each time you select this option EASEL switches between the two types of line.

5.4.1.4 LINE THICKNESS allows you to choose the thickness of the line. Type in a number between 0 (thinnest) and 100 (thickest) and press [Enter]. You can step over this option if you have selected a line filled to the axis. EASEL offers you a final option to check that you are satisfied with the result. Press [Enter] to see the graph with your style of line, or use the up or down cursor keys to go back to modify your selections.

5.4.2 NUMERIC ENTRY FOR LINES If you select a format which uses a line graph for your current figures, you can enter your data in exactly the same way as described for bar charts - simply type them in. The only real difference between line and bar representations appears when you are typing numbers into a set of figures represented by a line. In order to allow you to type new numbers - or change existing ones - without redrawing the whole graph for each number, EASEL does not use the true line colour. While you are typing in numbers, the graph is drawn using a thin line - or a filled line - depending on the line style you

have chosen. The colour of the line changes as it passes over any bars, lines or text. EASEL warns you in the status area that the line colour is not being shown correctly. When you have finished typing in the numbers, use the View command to see your graph with the correct colour and thickness of line.

5.5 3-D BAR CHARTS Format 4 shows your data in the form of a three-dimensional bar chart. Each set of figures is shown as a row of vertical rectangular blocks, with each successive set being drawn in front of the previous one. The chart is viewed at such an angle that the foreground bars do not obscure the ones behind. As you add more bars to the graph, the viewing angle is changed automatically. This ensures that you can always see the height of every bar. In most respects, apart from the appearance, such a chart behaves in the same way as the two-dimensional bar charts. You may select or design bars with the Bar option of the Change command. In this case you can select the colours of the three visible faces of the bar. Changing the graph paper and the vertical axis markings, adding or editing text and axis names and the View command are all exactly as described in earlier sections.

5.6 THE CELL CURSOR In a 2-D bar chart the vertical crosswire has two separate functions.

- 1) It marks the cell which will show the next number you type in. You can step the crosswire from cell to cell with the [TAB] or [Shift] and [TAB] keys.
- 2) Together with the horizontal crosswire, it locates or marks the position of text. You can move the crosswires smoothly across the screen by means of the cursor keys.

In a 3-D bar chart these two functions are visibly separate. Change to format 4 and type a few numbers into the graph. The cell at which the next bar will appear is marked by a perspective view of a rectangle, known as the cell cursor. This cursor moves from cell to cell when you press the [TAB] or [Shift] and [TAB] keys. Unlike in 2-D bar charts, these keys have no effect on the vertical crosswire. In 3-D bars you use the cell cursor in all cases where you need to identify a particular cell. It is therefore not only used when inserting or changing a cell value, but also for editing cell labels. You can edit the label at the cell marked by the cell cursor, rather than the one nearest to the vertical crosswire. Now press either $\frac{1}{4}$ or $\frac{1}{2}$. The vertical crosswire appears and moves smoothly across the screen. You use the crosswires for locating and editing text and axis names, as for 2-D bar charts.

5.7 PIE CHARTS Format 8 shows a set of figures as a pie chart. Although a pie chart is very different in appearance from a bar chart or a line graph, EASEL allows you to create one in the same way as for any other type of graph. Note that you can only show one set of figures at a time in pie chart format, and that any negative values are ignored since they have no meaning in such a diagram. If your data contains any negative values EASEL shows a message in the status

area, warning you that they are not included in the chart. Since you can only have one set of figures in a pie chart, the View command offers you the option of viewing the current set of figures - instead of the usual "all Figures". You can type in a replacement name as usual. If you type in a list of names (separated by commas) EASEL will display the first set of figures in the list, ignoring the rest.

5.7.1 ENTERING NUMBERS To illustrate entry into a pie chart, use the Change command to change to format 8, which is the pie chart format. Then use the Newdata command to create a new, empty, set of figures called, for example, "costs". EASEL draws a filled circle, labelled with the first cell label which, unless you have changed it, is "Jan". Type a number and press [Enter]. EASEL redraws the circle, but this time the number you typed in is shown under the label. The diagram is a pie chart with only one value. Now try typing in a few more numbers, just as if you were entering values into a bar chart. Note how each section is labelled, together with its value. Figure 5.3 shows a pie chart with some numbers entered.

5.7.2 THE CELL CURSOR During data entry into a pie chart the next cell to receive data cannot be shown by the vertical crosswire position. As in 3-D bar charts, the cell cursor and the vertical crosswire are visibly different. In a pie chart the cell cursor position is shown by highlighting the cell label. Press the [TAB] or [Shift] [TAB] keys to move the cell cursor. If the cell marked by the cell cursor contains no value it is not, of course shown in the pie chart. In this case its label is shown in a special highlighted display box at the bottom left of the display area. Try stepping through the labels with [TAB]. After the last labelled cell ("Dec" - unless you have changed it) the highlighting returns to the first cell. Press [F5] to add another cell after the one whose label is highlighted. EASEL gives each new cell the label "unnamed". You can edit this text with the Label option of the Edit command, as for the cell labels in a bar chart. The cell that you can edit is highlighted, and you can step from label to label with the [TAB] or [Shift] [TAB] keys before editing one. Cells not containing values are not shown in a pie chart. Such cells, however, still exist and will be shown if you switch to another format. As in bar charts and line graphs you must delete both the cell label (use the Label option of the Edit command, and press [F4]) and the number in the cell (step to the cell and press [F4]) before EASEL deletes the whole cell. Once you have deleted the contents of the cell and its label, the cell becomes an "unnamed" cell. As in the other formats, EASEL deletes such a cell when the graph is next redrawn.

5.7.3 TEXT You can add, delete, and move text and titles exactly as described in Sections 2.9 and 2.15. You use the horizontal and vertical crosswires in the normal way for adding, editing or moving such ordinary text.

5.7.4 THE CHANGE COMMAND Graph paper, bars, lines and graph axes have no meaning for a pie chart. EASEL does not allow you to use these options of the Change command when you are working with the pie chart format. The only

options which you are allowed to use are Text-direction, Format and Segment. The first two of these work in exactly the same way with a pie chart as in any other format.

5.7.5 SEGMENT You can only use the Segment option in the pie chart format. It allows you to change the colour of a segment of the chart. Select the Segment option of the Change command by pressing: **[F3] C S** Then select the segment whose colour you want to change - press [TAB] until its label is highlighted and then press [Enter]. EASEL draws the palette of possible colours in the display area. Press the left or right cursor keys to select the colour you want and then press [Enter]. EASEL redraws the pie chart with the segment in your chosen colour.

6.0 EASEL REFERENCE

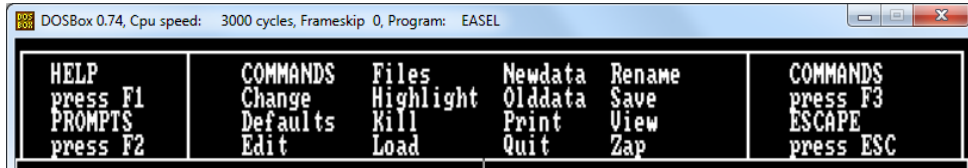
6.1 THE FUNCTION KEYS The function keys are used as follows:

Key	Plus	Action
[F1]		To obtain Help
[F2]		Turn the prompts on and off
[F3]		Call the command menu
[F4]		delete: text, labels, numbers, the key, user-defined objects
[F5]		insert a cell
[F6]		Freeze the task return to Xchange - <i>Not used in PC FOUR</i>
[F7]		erase the status area
[F10]		Redraw the screen contents rescaling the graph if necessary
[F4]	CTRL	Move the windows, if using the Pointer Environment with extended resolution - <i>Not used in PC FOUR</i>

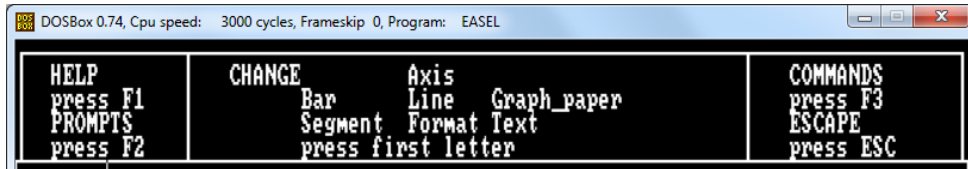
Note: user-defined objects are bars, lines, graph paper and axes that you have designed

6.2 SETS OF FIGURES A set of figures is the group of numbers that are shown as a single graph. You must give a name to each set of figures, although Easel gives the name 'figures' to the set that is available to you when you first enter an Easel task. You name a set of figures when you create the set, either with the newdata command or by using a formula. You can change the name of an existing set of figures with the rename command. When you create a new set of figures, or rename an existing set, it becomes the current figures - ie the one which you can affect by typing new numbers. The name of the current set of figures is shown in the status area. The current set of figures need not be shown on the screen (eg you could exclude it with the view command) but always becomes visible when you change it.

6.3 REPRESENTATIONS A representation is the way that a set of figures is shown on the screen. For example, you may represent a set of figures by a particular style of bar, or by a particular design of line. You may, in general, show a set of figures in any of the many possible line or bar representations. Each of the eight formats is provided with its own set of representations. You may change the representations to match your needs.



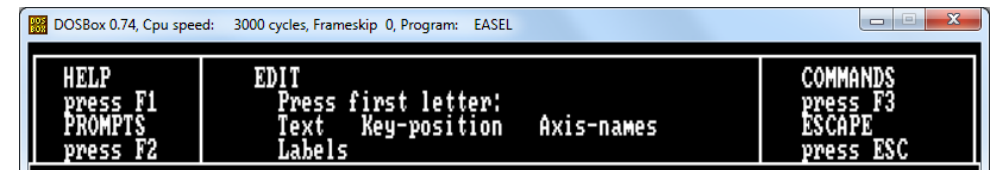
6.4 EASEL COMMANDS The commands allow you to use many of the more advanced facilities. All commands are selected by pressing [F3] and then the first letter of the command. The following commands are provided.



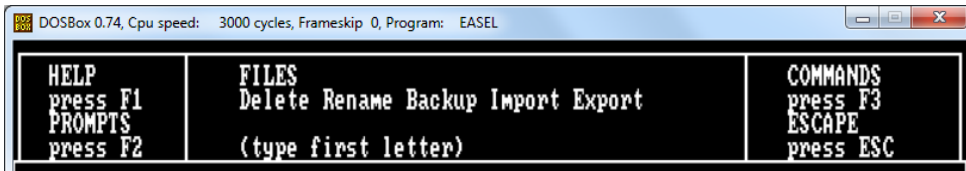
6.4.1 CHANGE Allows you to modify the appearance of any feature of the graph. Press the first letter of an option to select it. You are offered the following options: **A**xis - to select the axis markings. You can alter the colour of the axes and the axis limits. You may also select whether or not the axis lines are to be drawn. Easel will not allow you to select this option in format 8 (a pie chart). The option to change the axis limits allows you to choose between automatic (chosen by Easel) or manual limits. Press the 'A' key for automatic limits or the 'Z' key for automatic limits which always include zero. Alternatively, press the 'M' key to select manual limits. In this case you must type values for both limits. Easel may modify your choices of limits to ensure that the whole of your graph is shown, with simple numeric values on the scale. Note that the stacked bar formats (2 and 6) will always include zero on the axis, regardless of your selection of axis limits. **B**ar - to select or define the style of bar used to represent the current set of figures. You may choose one of the 1 previously defined bars by its number, or by example. The choice by example option allows you to select a bar or to design a new one. You can choose the bar fill colour and the border colour and thickness. Easel will not allow you to select this option in format 7 (a pie chart). **F**ormat - to redefine the appearance of the entire graph. You may choose one of the 8 defined formats by its number, or by example. **G**raph-paper - to select one of the 7 different graph papers, or to replace one with your own design. You can select both the background colour and the colour of the grid markings. Easel will not allow you to select this option in format 8 (a pie chart). **L**ine - to select one of the 16 line styles, or design your own line. You can choose the line colour and

thickness, and (for the colour display) the colour of the symbol used for each point on the line. You may also select a filled line, where the space between the line and the zero level on the graph is colour-filled. Easel will not allow you to select this option in format 7 (a pie chart). **S**egment - to select the colour of a particular pie chart segment. Easel will only allow you to select this option in format 7 (a pie chart). **T**ext - to select the colour and direction of text. You can select, from a palette of colours, the colour for all subsequently added (or edited) text. You may also select whether the text is to be drawn horizontally or vertically. Each time you select this option the text switches from one direction to the other. Any existing text will retain its original direction, but new text will appear in the selected direction, until you change it again.

6.4.2 DEFAULTS Allows you to select whether you use a 40 or 80 character display, and to set up different colours where available. Press '4' to select the 40 column, low-resolution 8 colour mode, press '6' for 64 column display or '8' for 80 column display to select the high-resolution 4 colour mode. The 8 colour mode may not be available on all hardware platforms, such as the Atari machines running SMSQ, or similar.



6.4.3 EDIT The edit command allows you to modify or move text, labels and the key. You are asked to choose between the following four options: **T**ext - you can move the crosswires to lock on to the nearest piece of text and then use the line editor to change the wording. When you are satisfied with the text you should press [Enter]. You are then offered the option of moving the text to a new position with the cursor keys. Press [Enter] when you are satisfied with the position. Edited text is shown in the direction set by the last use of the Text-direction option of the change command. The only exceptions are the axis names, which are fixed in direction. **L**abels - the crosswires lock on to the nearest cell label and you can then edit the text of the label as in the text option. Press [TAB] (or [Shift] [TAB]) to switch between labels. In the pie format the label to be edited is marked by the cell cursor. When you press [Enter] at the end of your editing you are not offered the option of moving the label; cell labels can not be moved. **K**ey - you are immediately offered the option of moving the key box with the cursor keys. When the outline of the key box is in the position you want you should press [Enter]. The key box is then redrawn in its new position. **A**xis - you are asked to press either the 'V' or the 'H' key to select the vertical or the horizontal axis name. The crosswires lock on the chosen name and you can edit the text and then reposition it as for the Text option. In general, in the edit command you can use [F4] to delete the item being edited.



6.4.4 FILES Allows you to modify Easel files previously saved on a disk, or to transfer data files to or from another of the members of the PC-FOUR family. Press the first letter of an option to select it. Whenever an option asks you for a file name you can press '?' for a list of the files on a given drive. You are offered the following options: **Delete** deletes a named file from a disk. Note that this command is not reversible and should therefore be used with great care. **Export** exports a named file. Type the name you want the file to have, then press [Enter]. If you do not specify a file name extension for the file, Easel will supply an extension of .exp. The file will contain all the sets of figures currently displayed on the screen, the names of these sets of figures and the text of the cell labels. Note that it does not necessarily include all the sets of figures that are in the computer's memory. The file is saved in a form suitable for being imported by other members of the PC-FOUR family. If the file is imported into, for example, the spreadsheet program Abacus, the names and cell labels become spreadsheet labels. See the 'Appendix A' for further details. **Import** imports a named file. Allows Easel to read data files exported from other members of the PC-FOUR family and display them in graphical form. Type the name of the file which you wish to import. If you do not specify a file name extension for the file, Easel will assume an extension of .exp. *Example file structure - from CashFlow.EXP - see 3.4 and Examples.ZIP*

```
"CashFlow$", "SALES", "COSTS", "PROFITS", "Wages", "advert", "rent", "elec", "dep", "Expenses", "NET"
"Jan", 4000, 2750, 1250, 700, 100, 200, 50, 90, 440, 810
"Feb", 4080, 2790, 1290, 700, 100, 200, 50, 90, 440, 850
"Mar", 4161.6, 2830.8, 1330.8, 700, 100, 200, 50, 90, 440, 890.8
"Apr", 4244.832, 2872.416, 1372.416, 700, 100, 200, 50, 90, 440, 932.416
"May", 4329.72864, 2914.86432, 1414.86432, 700, 100, 200, 50, 90, 440, 974.86432
"Jun", 4416.3232128, 2958.1616064, 1458.1616064, 700, 100, 200, 50, 90, 440, 1018.1616064
"Jul", 4504.649677056, 3002.324838528, 1502.324838528, 700, 100, 200, 50, 90, 440, 1062.324838528
"Aug", 4594.7426705971, 3047.3713352985, 1547.3713352985, 700, 100, 200, 50, 90, 440, 1107.3713352985
"Sep", 4686.637524009, 3093.3187620045, 1593.3187620045, 700, 100, 200, 50, 90, 440, 1153.3187620045
"Oct", 4780.3702744892, 3140.1851372446, 1640.1851372446, 700, 100, 200, 50, 90, 440, 1200.1851372446
"Nov", 4875.977679979, 3187.9888399895, 1687.9888399895, 700, 100, 200, 50, 90, 440, 1247.9888399895
"Dec", 4973.4972335786, 3236.7486167893, 1736.7486167893, 700, 100, 200, 50, 90, 440, 1296.7486167893
```

6.4.5 HIGHLIGHT This command allows you to use a special style to represent a particular number in a set of figures, or all negative values in a bar chart. Easel first asks you to press either the 'V' key to highlight a particular value, or to press 'N' to highlight all negative values. You are not allowed to select this second option for a pie chart. If you choose to highlight a value Easel asks you to select the value. Press [TAB] (or [Shift] [TAB]) to select the cell you want to highlight and then press [Enter]. In the case of a bar graph you are shown the selection of defined bars, and can choose one - or design a new one - as in the Bar option of change. In a pie chart the selected segment is detached from the remainder of the pie. If you select the option to highlight negative values, Easel immediately asks

you to select or design a bar to be used for all negative values in the current set of figures.

6.4.6 KILL Erases the data for one or more sets of figures. When you select this command you are asked to type in a list of the names of the figures you want to delete, separated by commas and ending with [Enter]. You can, if you like, type in the text all figures.

6.4.7 LOAD Loads a previously saved graph from a disk. Easel asks you to type in the name of the file to be loaded. All the design options are loaded with the data so that the graph of the loaded data has exactly the same appearance as it had when it was saved. If you do not specify a file name extension, Easel assumes an extension of .grf.

6.4.8 NEWDATA Creates a new set of figures, which becomes the "current figures". You are asked to type in the name of the new set (no quotation marks are needed). When you press [Enter] you are returned to data entry mode, ready to enter values.

6.4.9 OLDDATA Makes an existing set of figures the "current figures". You are asked to type in the name of the existing set (no quotation marks are needed). When you press [Enter] you are returned in data entry mode, ready to change or add to this set of values.

6.4.10 PRINT Prints the graph that is currently displayed on the screen. 5 options are presented: **Print** Press the 'P' key to print the graph directly on your printer. If your printer is not Epson / IBM Proprietary compatible, you should first use the 'I' option (see below) to install a suitable printer driver. The default printer driver, for Epson / IBM printers, is called "gprint.pr", and should be located on the help device. **Screen dump to file** Press the 'S' key to send a screen dump to a file. You are asked to type in the name of the file, which is assumed to have a file name extension of ".pic". This results in a raw 32 kilo-bytes screen dump, as does using the extension ".scr". Using the extension ".cut" produces a file suitable for loading by Qdesign or any other modern drawing program. Such a file consists of a 10 byte header followed by 32 kilo-bytes. Using any other extension produces a file with a slightly modified header. **Epson plotter** Press the 'E' key to send the graph to an Epson HI-80 pen plotter connected to the serial port. **H-P plotter** Press the 'H' key to send the graph to an Hewlett-Packard 7475 pen plotter connected to the serial port. **Install new graphics printer** Press the 'I' key to install a new printer

Printing from EASEL running in DosBox requires it to be configured to direct the printout to LPT1 or similar. As DosBox was primarily designed for running legacy DOS based games the config file doesn't have a [printer] section.

Experienced users may experiment by using the printer driver creator PEDIT outlined in Appendix B.

driver. The default graphics printer driver is called "gprint.prt", and is suitable for Epson and IBM Proprinter compatible printers. The default graphics printer driver, "gprint.prt", can be configured to send the screen dump to either the current SPL_USE device, or to a fixed device. The former is the default, the latter will be necessary, if you do not use ToolKit II, or do not wish to use the SPL_USE device.

6.4.11 QUIT Discards the current Easel task and returns to DOS. You are offered the options to press [Enter] to confirm your choice and return to DOS, or to press [Esc] to cancel the command and return to Easel's command menu.

6.4.12 RENAME This command allows you to rename an existing set of figures. Easel asks you to type in the old name and then the new name. Press [Enter] at the end of each name. The renamed set becomes the current figures. You may use upper or lower case characters for the name of a set of figures. Easel ignores the case when you refer to the name in a formula.

6.4.13 SAVE Saves a graph as a disk file. It saves only those set of figures currently shown on the screen. You are asked to type in a name under which the figures will be saved. If you do not specify a file name extension, Easel assumes an extension of .grf. All the properties of the graph, such as the bar colours, are saved with the figures. Note that the saved graph is dependant on the monitor type you were using when you created it.

6.4.14 VIEW Re-displays your graph, showing all or any of your sets of figures. Easel suggests that all sets of figures are to be displayed and you can either accept this suggestion, by pressing [Enter], or type in a list of the names of those sets that you want to be displayed. You should separate the names in the list by commas and end the list by pressing [Enter]. You are then offered a suggested format number for the display. You can accept the suggested format (which is the last one you were using) by pressing [Enter], or you can type in your own choice of format number, followed by [Enter]. In the pie chart format Easel suggests only the name of the current set of figures. If you type in a list of names of figures to be shown in this format Easel shows a pie chart of the first name in the list and ignores the remaining names.

6.4.15 ZAP This command erases all text, all sets of figures and all user-defined objects (bars, lines and so on) from your current Easel task. It also restores the original month labels for the cells. It does not, however, restore the original appearance of the graph formats, but leaves any changes that you may have made (for example, a change of graph paper, or of the bar designs that a format uses).

6.5 FUNCTIONS Think of a function as a kind of recipe which converts a number of initial values, known as the function's arguments, into a different value, which is said to be the value this is returned by the function. The functions provided by Easel take one or no arguments. The argument for a function is placed in brackets after its name. You must not leave a space between the name and the opening bracket, but spaces are allowed within the brackets, even if they take no arguments. The presence of the brackets is a useful reminder that you are referring to a function. They allow you to distinguish between the name of a set of figures and a function, even if they have the same name. The following functions are provided:

ABS(n) Returns the absolute value, that is the numerical value irrespective of its sign, of the argument. For example, abs(5) and abs(-5) both return the value 5.

ATN(n) Returns the angle, in radians, whose tangent is n.

COS(n) Returns the cosine of the given (radian) angle.

DEG(n) Takes an angle, measured in radians, and converts it to the same angle in degrees.

EXP(n) Returns the value of the constant e (approximately 2.718) raised to the power n. The returned value will be in error if n is greater than +82, since the result will then exceed the numeric range of Easel.

INT(n) Returns the integer value of a number, by truncating at the decimal point. The truncation always operates towards zero. For example:

int(3.7) returns 3
int(-4.8) returns -4

LN(n) Returns the natural, or base e, logarithm of n. An error results if n is negative or zero, since logarithms are not defined in this range.

PI() Returns the value of the mathematical constant pi.

RAD() Takes an angle, measured in degrees, and converts it to the same angle in radians.

SGN(n) Returns +1, -1, or 0 depending on whether n is positive, negative or zero.

SIN(n) Returns the value of the sine of the specified (radian) angle.

SQR(n) Returns the square root of the number n, which must not be negative.

TAN(n) Returns the tangent of the specified (radian) angle.

6.6 CELL and CELLMAX The following two items are not strictly functions, although they do return a value. They may only be used within a formula which creates a new set of figures.

CELL Within an expression or formula, cell returns the number of each cell. It has a value of 1 in the first cell, 2 in the second, and so on. A simple example, to create a set of figures called "example" is: `example = cell`

CELLMAX Within an expression or formula cellmax returns - in each cell - the total number of cells currently being used. You can, for example, find the number of cells in your graph by creating a new set of figures called, for example, "size" with the formula: `size = cellmax`

6.7 GPRINT.PRT The current version of gprint.prt, V1.01, is based upon the original gprint.prt supplied with EASEL, but with a number of improvements. Gprint.prt has been altered to work with EASEL even on extended resolution machines, in both MODE 4 and MODE 8. This version of gprint.prt should work with Epson and IBM Proprinter compatible printers, since the printer control codes "ESC A 8" has been replaced by "ESC 3 24". This way of setting the linefeed distance works on both Epson and IBM, whereas "ESC A 8" only works on Epson. Gprint_prt works on extended resolution machines, as it now always uses the correct screen addresses, by reading -4(A5) and -6(A5), in a way similar to the updated graphics routines in Xchange. Gprint.prt now only prints the necessary graphics area, leaving out the area used by the menu and the editing and status area. Further, the device-name used has been made configurable (using Qjump CONFIG), and by giving an empty string as device-name, the current SPL_USE setting will be used. The introduction of these patches means that this gprint.prt cannot be used outside Xchange, mostly because of it's dependence upon A5 being set up to point to the Xchange "system variables", but also because it does not dump the entire screen. The assembly-source of gprint.prt is supplied as eponibm.asm, in case you need to adapt it for other printers.

6.8 THE START-UP PARAMETERS When you first load Easel it is in the state described by the following list. You can change each of the properties by the method indicated in the right hand column.

<i>Feature</i>	<i>Initially</i>	<i>Change By</i>
Default (screen)	40 Column (coloured)	[F3] Design C - 4 or 8
Number of cells	12 (months)	[F3] Edit Labels [F4]
Format	1	[F3] Edit Format (?)
Graph Paper	1	[F3] Change Graph (?)
Axis	1	[F3] Change Axis (?)
Bar	3	[F3] Change Bar (?)
Line	1	[F3] Change Line (?)
Text	While	[F3] Change Text

After issuing a Zap command some of the parameters are retained..

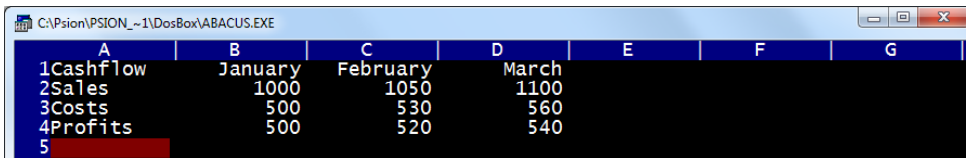
Appendix A

Import, Export and Transfer

You can transfer information between the programs of the PC-FOUR family with a comprehensive set of import and export commands. The information used by, for example, ABACUS, ARCHIVE and EASEL is very similar in nature, in that it can always be represented in the form of a table. Transferring information between them is therefore straightforward. QUILL handles formatted text which cannot, in general, be represented in tabular form. It must be treated in a different way from the other members of PC-FOUR. Each member PC-FOUR has its own Export and Import commands, usually as an option within the files command. ARCHIVE, however has separate Export and Import commands within its programming language.

First consider the direct use of the Export command of one task and the Import command of another. These commands are described in the commands section. Export creates a named file which is automatically saved on disk. This file can then be imported to another task, or to several tasks. The export file remains available until you decide to delete it.

Let us first consider export and import between ABACUS, ARCHIVE and EASEL. The export files produced by all three programs are identical in structure and can be imported to any of them, regardless of the program of origin. Suppose we have an ABACUS grid containing the following information ready for Exporting:

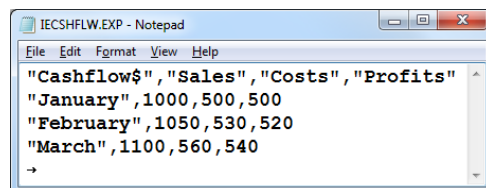


	A	B	C	D	E	F	G
1	Cashflow	January	February	March			
2	Sales	1000	1050	1100			
3	Costs	500	530	560			
4	Profits	500	520	540			
5							

If we exported this data and then imported it to EASEL, it would be interpreted as three sets of figures, named 'sales', 'costs' and 'profits'. EASEL interprets the first set of text items that it finds - in this case the month names - as the cell labels for the graph.

The scheme is:

cell labels>January,February,March
sales graph>1000,1050,1100
costs graph>500,530,560
profits graph>500,520,540



```
IECSHFLW.EXP - Notepad
File Edit Format View Help
"Cashflow$", "Sales", "Costs", "Profits"
"January", 1000, 500, 500
"February", 1050, 530, 520
"March", 1100, 560, 540
```

EASEL does not use the first piece of text 'cashflow'. When you export a set of figures from EASEL, it automatically inserts the text 'label' in this position to maintain compatibility with ABACUS and ARCHIVE. If we were to import this same export file to ARCHIVE, the result would be a data file containing three records, each of which would have four field names cashflow\$ (a text field) costs sales and profits (numeric fields).

Rules

To make sure that export files are compatible with all members of PC-FOUR there are a few rules to remember about exported data. They mainly affect the export of information from ABACUS.

- (1) When you export the contents of a grid from ABACUS, the section of the grid being exported must have text in the first cell of each row (or of each column if you export it in column order). The text must not include spaces but an underscore, for example net_profit is acceptable.
- (2) If the first cell of any row (or column) of an ABACUS grid is empty, that row (or column) is not exported. There must be data in the cell immediately following the text cell in each exported row (or column). The type of this data (numeric or text) determines the data type used for all the data in the rest of that row (or column). Each row (or column) must therefore contain all numeric or all text data.
- (3) You can export files from ABACUS or ARCHIVE which contain several sets of textual data. EASEL can only export a file containing one set of textual data - the cell labels.
- (4) If you import a file containing several sets of data to EASEL, it uses the first set for its cell labels and ignores all following sets of text.

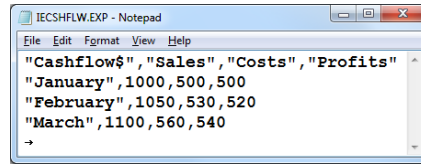
The Export File Structure

The export file consists of a series of records. Each record ends with the two characters <CR> (ASCII code 13) and <LF> (ASCII code 10). The import commands will, however, accept either of these characters - or the two together, in either order - as an end of record marker. The end of the file is marked by a control-Z (^Z) character (ASCII code 26). Each record consists of a series of values, separated by commas. The values are either text (which is enclosed in quotes) or numbers. The first item in each record must be text. If its name ends



with a dollar sign, the following values must be all text. Otherwise the following values must be all numeric. The export file produced by exporting the data of from ABACUS.

```
"cashflow$","sales","costs","profits"<CR><LF>
"January",1000,500,500<CR><LF>
"February",1050,530,520<CR><LF>
"March",1100,560,540<CR><LF>
^Z
```



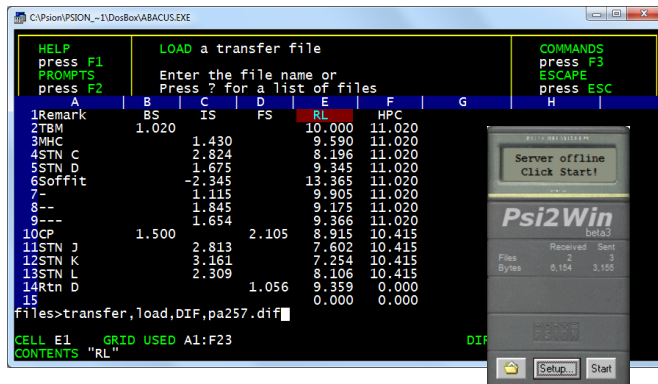
Export and Import for QUILL

Since QUILL works with formatted text, a file imported to QUILL must be a plain text file, rather than the normal tabular export file structure. QUILL will accept any ASCII text containing form feeds and line feeds (ASCII codes 12 and 10 respectively) in addition to the printable ASCII characters. Any other characters in the file are simply ignored. QUILL interprets a line feed as the end of a paragraph and a form feed as a page break. The Export commands of ABACUS and ARCHIVE can produce text files suitable for import by QUILL. ARCHIVE can also export a formatted report to QUILL. You do this by printing (with **lprint**) the report to a file, using the export option of the spoolon command. A file exported from QUILL contains only plain text and line feed characters, marking the end of each paragraph. In general, a file exported from QUILL is not suitable for import to the other members of PC-FOUR. The main purpose is to be able to produce text files that are readable by a wide range of other programs. (You can, however, write text - containing the necessary quotation marks, dollar signs and commas - that will result in an export file that can be imported to ABACUS, ARCHIVE or EASEL.) One obvious use of export from QUILL is to allow you to write or edit programs. You can, for example, write ARCHIVE programs in QUILL. Once you have exported them, they are in a suitable form for immediate loading and running.

Import from PSION Organiser II Pocket Spreadsheet

Connect the Organiser to a PC with *Psi2Win* select [Plan] and [Load] the pocket spreadsheet file. Use [Mode][File][export][Dif] filename.

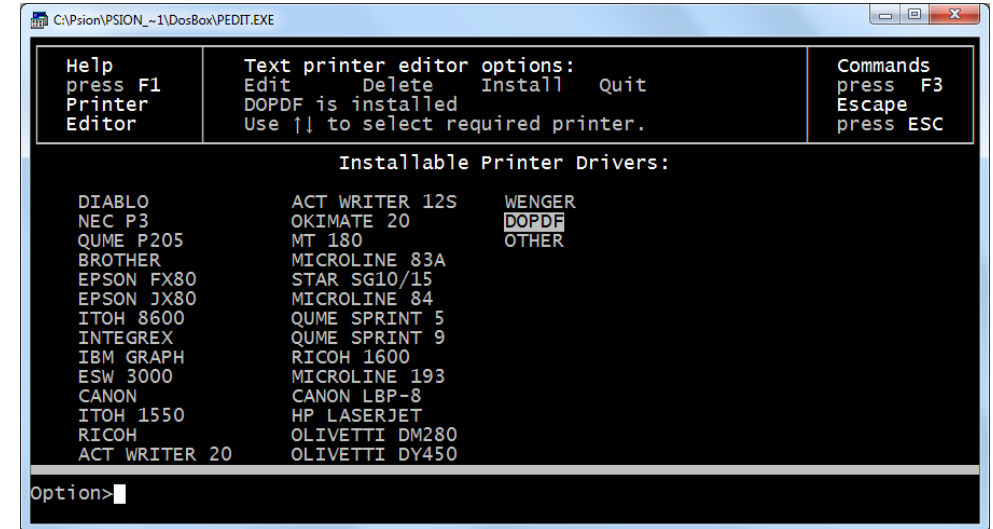
In abacus use [F3] File Transfer Load Diff filename. This will transfer the 'data' but all the formulae and formatting will be lost.



Appendix B

Printer Drivers

Use PEDIT to create an appropriate printer driver. For any PC FOUR application to print it requires a printer configuration file: TPRINT.RES for text based applications and GPRINT.RES for the Easel Application.



To run PEDIT ensure PEDIT.EXE and PRINTER.RES are in the same directory. Use [Edit] to adapt or create a new printer driver. Using [Install] will place (or overwrite) the TPRINT.RES in the same directory.

Appendix C

Zip file contents. PCFOUR.ZIP and Examples.ZIP

PCFOUR.ZIP		PCFOUR.ZIP		
Group.aba	Example Spreadsheet	<i>Unnamed.TMP</i>	<i>Temporary file</i>	
GemEasel.app	GEM OS Application	<i>ABACUS.TSL</i>	<i>xchange Task Sequencing Language tutorial files</i>	
ABACUS.EXE	PC-FOUR Applications, including the printer driver editor (PEDIT)	<i>ARCHIVE.TSL</i>		
ARCHIVE.EXE		<i>EASEL.TSL</i>		
EASEL.EXE		<i>QUILL.TSL</i>		
PEDIT.EXE				
QUILL.EXE				
Company.dbf	PCFOUR.ZIP Supplied example database files	EXAMPLES.ZIP		
Expenses.dbf		Birds.doc	Birds list document	
Payrol.dbf		QuillMan.doc	Quill Manual	
Persons.dbf		Template.doc	Quill 9.1	
Salaries.dbf		Examples.aba	Abacus 3.3	
Blunders.exp		Export file for Quill	CashFlow.aba	Abacus 5.1
ABBA.HOB		Application Help Files	BarChart.aba	Abacus 5.2
ARCHV.HOB	Cheques.aba		Abacus 5.4	
GRAF.HOB	AutoBar.aba		Abacus 5.6	
QUILL.HOB	Mortable.aba		Abacus 5.7.1	
Expenses.IX1	Example database index files		MortCalc.aba	Abacus 5.7.2
Payrol.IX1		IRR.aba	Abacus 5.8	
Persons.IX1		HPC02.aba	Abacus 5.9	
Salaries.IX1		IECshFlw.aba	Abacus Appendix A	
Persons.IX2		MailList.prg	Archive 9.0	
*.OVL	<i>xchange overlay files</i>	QPSION.csv	Archive 14.0	
Demo.prg	Example database programme files	QPSION.exp		
Persons.prg		QuizPack.scn		
Printer.res		QuizPack.prg		
TPrint.res	Printer driver files	Qarchive.exp		
Gazet.scn	Screen layout files for Archive	Qquill.csv		
Helpp.scr		CashFlow.exp	Easel 3.4	
Persons.scn		CashFlow.grf		

Manual display suggestions

Print the manual pages - 2 up on A4 landscape single sided. Centre cut to A5 sheets and place in A5 Poly Pocket Ring Binder or A5 Display book presentation folder.

The collage shows various pages from the manual, including:

- Introduction:** Explains the Pocket Spreadsheet's capabilities and how to use the Organiser.
- Starting up:** Provides instructions on how to run the Spreadsheet, including pressing the [ON/CLR] key and the [COPY/RESET PLAN] key.
- Fitting the pack:** Shows how to insert the Pocket Spreadsheet pack into the Organiser II, with a diagram of the device and instructions on how to push the pack into the empty slot.
- Contents:** Lists the manual's sections, including Part One (Tutorial) and Part Two (Reference).
- Index:** Provides a quick reference for various features and commands.

The manual pages are shown alongside a blue and pink A5 Poly Pocket Ring Binder and a pink and blue A5 Display book presentation folder, demonstrating how the manual can be organized and presented.