VIEWCHART

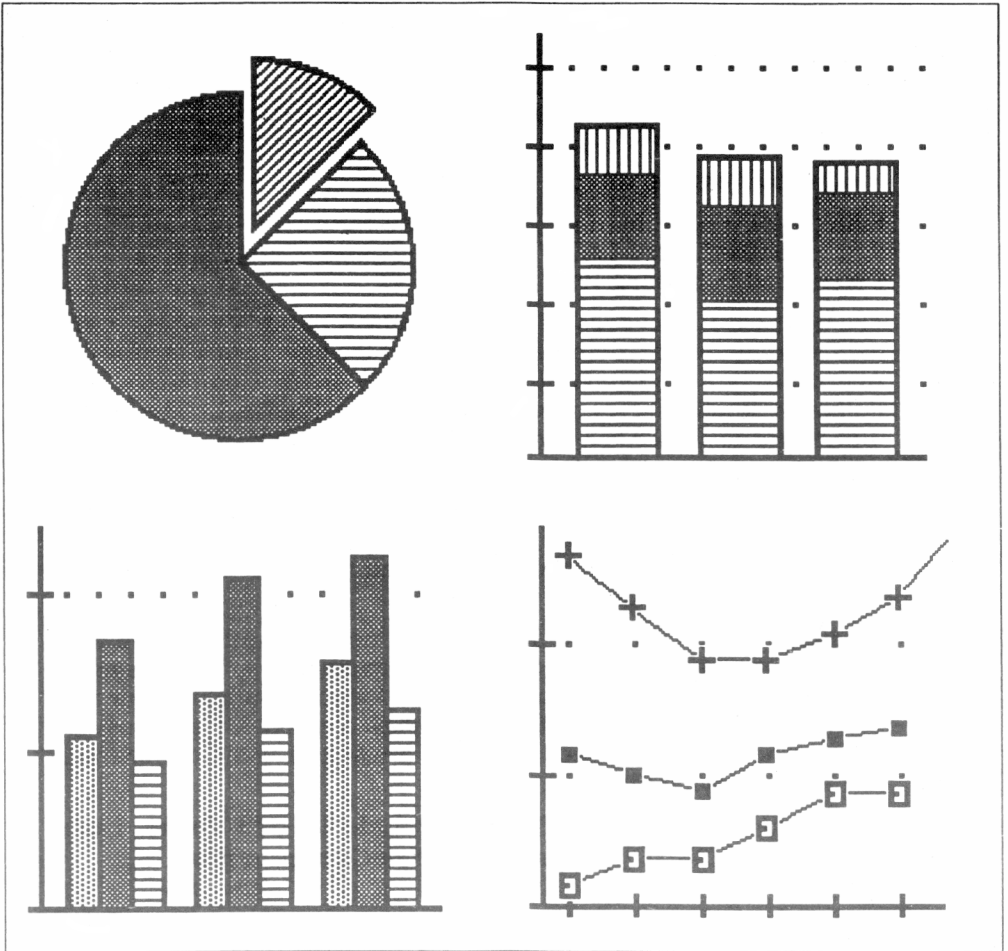## CHART PLOTTING SOFTWARE FOR THE VIEW FAMILY

DISC SOFTWARE FOR THE BBC B/B+/MASTER 128 FROM ACORNUSER

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VIEWCHART

Chart plotting software for the View family

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1 INTRODUCTION

Welcome to the Acorn User ViewChart Disc. This features a suite of linked programs which can be used to produce high resolution graphics in either piechart, barchart, or linegraph format. Data can either be entered manually, or read from disc files created from the ViewSheet spreadsheet or from the ViewStore database. Example data files are included on the disc to demonstrate the operation of the latter two.

The ViewChart disc has been developed from a series of articles originally published in Acorn User magazine in January/February 1985, and January/February 1987. The operating instructions given here will enable you to make full use of the software, but you may also find it worthwhile to refer to the original articles for further background information.

ViewChart operates in Mode 0, to obtain the highest resolution graphics and to take advantage of the 80 column text for labelling and adding text. It is primarily intended for production of charts to be dumped as screen images to a dot matrix printer, for incorporation in written documents or other presentations.

An 'Epson compatible' screen dump is included as part of the package which will produce a printout equivalent to the full width of an A4 sheet. You may find that these printouts are at their most effective if subsequently reduced in size using a photocopier or other means. On page 19 we have covered the installation of other printers. On page 21 there are some hints about good presentation.

2 USING THE DISC

The disc supplied is in 40 track DFS format. If you have a 80 track disc drive, you can convert the disc to run in 80 tracks. See page 19 for details.

To operate the disc, simply insert it into Drive 0, and !BOOT it by pressing BREAK whilst holding down the SHIFT key. A title screen will load which illustrates each of the four types of diagram available:

1) Piechart (1-5 pies, each with up to 5 segments)
2) Stacked barchart (1-25 bars, each with up to 5 segments)
3) Grouped barchart (Up to 24 bars, in groups of 1-5)
4) Linegraph (1-5 lines, each with up to 40 points plotted)

A menu at the bottom of the screen will ask you to select one of the following three data entry options:

1) Enter data manually
2) Read data from a disc file in ViewSheet format
3) Read data from a disc file in View Macro format

Note that pressing BREAK at any time will reboot the disc and return you to this menu.

Press either '1','2', or '3' in response to the prompt, and the disc will load a second menu. This is common to all the plotting routines, regardless of the method of data entry selected previously. It will be referred to in this text as the 'utilities' menu, and offers the following five options:

1) Plot data
2) Draw label
3) Load screen
4) Save screen
5) Screendump

Note that pressing ESCAPE will always return you to this menu if you wish to abort any subsequent operation.

When using the disc for the first time, simply press '1' to start plotting data, and you will then be asked to choose which of the four types of diagram you want to create.

Note that this choice will depend to a large extent on the nature of the data to be plotted. Piecharts, for instance, only really make sense when they are used to display information which can be

combined to form a 'whole'. They can show the relative size of different age groups within a population, for example. In this instance, each pie might illustrate comparable data for a particular year. A piechart could not, however, sensibly show the fuel consumption and acceleration of various motor cars, since the two characteristics are discrete and cannot be 'added' together in any way. This latter information could, however, be presented in the form of a grouped barchart. Each model of car would be illustrated by a group of two adjacent bars, one for fuel consumption, and one for acceleration.

3 THE MANUAL DATA ENTRY ROUTINES

If you have selected manual data entry, you will first need to supply certain information according to the type of diagram. The information needed is as follows

1) Piechart

- Number of pies in the diagram (1-5)
- Number of segments in each pie (1-5)

2) Stacked barchart

- Minimum and maximum values to be shown on vertical axis (minimum value will usually be zero)
- Size of steps to be marked on vertical axis
- Number of bars to be drawn (1-25)
- Number of subdivisions in each (1-5)

3) Grouped barchart

- Minimum and maximum values to be shown on vertical axis (minimum value will usually be zero)
- Size of steps to be marked on vertical axis
- Number of groups of bars
- Number of bars in each group

4) Linegraph

- Minimum and maximum values to be shown on vertical axis
- Size of steps to be marked on vertical axis
- Number of lines to be plotted (1-5)
- Number of points to be plotted in each (max 40)

Note that the size of the steps to be marked on the vertical axis of barcharts or linegraphs should be no smaller than one twentieth of the total data range. If you enter a value that is too small, ViewChart will reject it (sounding a 'beep') and prompt you to re-enter the value. Before plotting the data, you will also be prompted to enter text for the key entries, which are printed in the right hand screen window. Each text entry can be up to 25 characters in length, and ViewChart will automatically position the text, splitting it over two lines if necessary.

For piecharts and barcharts, you will also be offered the option to alter the hatch tones used to distinguish each segment or bar in the diagram. Up to 25 different tones can be used, including blank or solid fill. These can be cycled through by using the CURSOR UP/DOWN

keys. If you wish to retain the default tone values, simply press RETURN in response to this prompt.

Operation of ViewChart has been designed to be as simple and 'user-friendly' as possible. Once you have supplied the above information, ViewChart will construct the diagram as you enter the data, and will automatically scale and position the bars, pies, etc. Experiment with different ranges of numbers - the plotting routines have been written to cater for virtually any range of data, including very small decimal fractions, and both positive and negative values (although mixing the latter is definitely NOT recommended if you are constructing a piechart!).

Note that the manual piechart plotting routine offers one facility which, for technical reasons, is not available in the corresponding ViewSheet/View Macro routines. This is the ability to 'explode' individual segments of each pie outwards from the centre. This is offered as an option before plotting each segment of the pie.

4 THE UTILITIES MENU

After plotting your diagram, or after pressing ESCAPE, you will be returned to the utilities menu. The options available are:

1 Plot data

The current screen is cleared and you are prompted to draw a new diagram. This will stick to the method of data entry previously selected from the initial menu when the disc was first !BOOTed. If you wish, for example, to switch from reading disc data to manual data entry, press BREAK to reboot the disc.

2 Draw Label

Add text or perform simple line drawing. The line drawing routine requires you firstly to move the cursor to the start position of the line to be drawn, and to 'mark' this by pressing RETURN. This should then be repeated for the end position of the line.

The text drawing routine offers two sets of options. The first allows text to be either centred on either side of the cursor position, or printed to the right of the cursor. The next option controls the manner in which the text is printed to the screen. Text can be printed so as to delete any background information (option 1), or to be superimposed over the existing background (option 2), or printed with underlining (option 3).

Note that existing text can easily be deleted or edited by selecting option 1 (delete background), and simply printing a string of spaces.

3 Load screen

Load a completed or part-completed screen from disc.

4 Save screen

Save current screen to disc.

5 Screendump

Dump current screen to printer. This option calls a machine code screen dump utility SDUMP from disc. The version supplied with ViewChart is suitable for Epson compatible printers only. If you wish to use a different dump, see page 19.

5 DISC MANAGEMENT

It is very important to remember that ViewChart makes extensive use of disc overlays to load program segments. It is therefore essential that the master disc (or backup) is always present in Drive 0 when using ViewChart. If you use a single disc drive, you are advised to make a backup copy of the disc (consult your DFS manual for details - the command is normally *BACKUP) and use the spare space on side 0 for temporary storage of any screens or datafiles you are working with.

 If you have a double sided or dual disc drive you can easily access screen or data files stored on other disc surfaces by prefixing any filenames with a colon followed by the drive number, according to normal DFS conventions. So to access a file 'Shares' on drive 1 you give the filename as ':1.Shares'.

When reading ViewSheet or View Macro datafiles, the error message 'Channel' will be given if you type the name of a file that is not present, instead of the more common DFS message 'File not found'.

6 PLOTTING FROM VIEWSHEET DISC FILES

ViewChart can generate diagrams from data read directly from disc files which have been created in a special format. This format is used by ViewSheet to transfer data from one spreadsheet to another. This method of data entry is selected by pressing '2' in response to the initial menu of data entry options presented on booting the ViewChart disc.

Full details of the method of setting up the appropriate ViewSheet linking files are given in Chapter 12 of Part 2 of the ViewSheet manual. If you don't have a ViewSheet, a summary is given at the end of this section. Essentially, these files are equivalent to a two dimensional array, each element of which maps onto a single cell of the spreadsheet. The disc file is set up from within Viewsheet using the command CREATE n X Y. This would create a blank disc file with the filename V.VSn, with dimensions (X,Y).

Files in identical format can also be generated from the ViewStore database, using a special utility program LINK. Full details are given in the ViewStore manual, Chapter 3.

A sample datafile is included on the ViewChart disc for demonstration purposes, with the filename V.VS1. Note that ViewChart will supply this as a default filename when prompting for the datafile, and will use the demonstration file if you simply press RETURN in response to this prompt. If you wish to read data with a different filename, press any key other than RETURN and the default filename will be deleted.

When reading data from a ViewSheet disc file, ViewChart first reads the dimension of the file and will configure the diagram accordingly. The relationship between the elements of the disc file and the ViewChart diagram is as follows:

Piechart:

> X= number of pies (max 5)
> Y=number of segments in each pie (max 5)

Stacked barchart:

> X=number of bars (max 25)
> Y=number of segments in each bar (max 5)

Grouped barchart:

> X=number of groups of bars (max 12)
> Y=number of bars in each group (max 5)

Linegraph:

> X= number of points plotted in each line (max 40
> Y=number of lines plotted (max 5)

For instance, a file with dimensions 3 x 5 would be plotted as a piechart with 3 pies, each split into 5 segments. Element (2,4) of the disc array would be plotted as segment 4 of pie 2.

It is essential that the 'Y' dimension of the disc file should not exceed 5, otherwise ViewChart will not be able to read the data correctly. If the 'X' dimension of the disc array should be larger than the maximum values given above, ViewChart will simply read in the maximum permitted number of items of data and ignore any additional data. This occurs with the demonstration file V.VS1, for instance, when used to plot a piechart. ViewChart simply extracts the first 5 sets of data, since it is unable to plot more than 5 pies on a single diagram.

Labelling

It is important to note that ViewSheet format linking files can only contain numeric data. They cannot be used to export string data or text labels from the spreadsheet or database. It is therefore necessary to manually add any labels for the horizontal axis and key of the ViewChart diagram. ViewChart will prompt you for this information after first reading in the numeric data from the disc file, and will position the text automatically. Should you wish to omit any of these labels, simply press RETURN in response to the prompts.

Note that labels for intervals along the horizontal axis of barcharts and linegraphs should have a maximum length of 25 characters. Only the first 3 words are printed, centred above each other.

Setting up the spreadsheet

To illustrate the relationship between the disc file and the ViewChart diagram more clearly, the Viewsheet spreadsheet file used to generate the datafile V.VS1 is also include on the ViewChart disc. This has the filename 'V.Sheet1', and appears as follows when read into ViewSheet:

	A	B	C	D	E	F	G	H	I
1	DATA:								
2		Record1	Record2	Record3	Record4	Record5	Record6	Record7	Record8
3	Field1	910	932	960	978	990	1010	1045	1030
4	Field2	146	165	194	180	165	155	150	162
5	Field3	260	234	220	204	190	178	192	208
6									
7									
8	MAP:	U.VS1							
9		910	932	960	978	990	1010	1045	1030
10		146	165	194	180	165	155	150	162
11		260	234	220	204	190	178	192	208
12									
13		File created using: 'CREATE '1 10 3							
14									
15									

Table 1: Spreadsheet 'V.Sheet1' generates disc file 'V.VS1'

Cells B3 to I5 contain the raw statistical data. Cells B9 to I11 act as a 'map', containing the instructions for the spreadsheet to transfer the data to the disc file. Thus cell B9, for instance, contains the command WRITE(1,COL-1,ROW-8,B3). This instructs the spreadsheet to write the contents of cell B3 to element (1,1) of file V.VS1.

Note that the instruction in cell B9 could have been simplified to WRITE(1,1,1,B3). However, the use of the ViewSheet functions ROW and COL enables you to save considerable time in setting up the spreadsheet, since it enables you to quickly copy the command using the REPLICATE function. Having entered the formula into cell B9, press function key f0 to replicate this vertically. Enter 'B9-B10B11' in response to the 'From - To?' prompt. Then repeat this to replicate column B9B11 into columns C to I by entering 'B9B11-C9I9'. Press 'R' in response to all prompts for R)elative, N)o change?.

Summary

1 Decide on a rectangular area on the sheet to be plotted, making sure this is not too big for the type of plot you require. In the example we have used B3 to I5, B3 is the top left, I5 the bottom right.

2 Press ESCAPE, then type a CREATE command big enough to hold the data. The first parameter is the file number (0-99), the second is the number of figures across the rectangle, the third is the number of figures down. Our example has 8 across and 3 down, so

```
CREATE 2 8 3
```

will create a file called V.VS2 that is the right size.

3 Press ESCAPE again to select a blank area on the sheet big enough to put the WRITE instructions in, and move the top left corner. In the example we have used B9-I11, so the cursor would go to B9.

4 Enter a write command with four parameters

a) the file number
b) COL-n, where n is the column number minus one. ie column A=1, B=2 etc.
c) ROW-n, where n is the row number minus 1
d) The cell number of the top left cell to be plotted

So for our example in B9, the command is

```
WRITE (2,COL-1,ROW-8,B3)
```

5 Replicate this into the rest of the column. Press f0 and type the first WRITE cell number (or press SHIFT-COPY if your cursor is still on the first cell), followed by a dash, and the parameters of the rest of the column. There are three rows in our example (3 to 5) so to create a column of three WRITE slots type:

```
B9-B10B11
```

(type R for relative at each 'R)elative N)o change' prompt.

6 Now replicate the other columns. Press f0 and type the co-ordinates of the first columns, followed by the co-ordinates of the top of the next column, and the top of the final column. In our example this is:

```
B9B11-C9I9
```

This copies the first column into the other columns. Again, the R)elative response should be given at each prompt.

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7 PLOTTING FROM VIEW MACRO FILES

As an alternative to reading data from ViewSheet format disc files, ViewChart can also generate diagrams from data stored in a second special format. This corresponds to the format created by using the utility 'MACRO' from the ViewStore database. This data entry method is selected by pressing '3' in response to the initial menu of data entry options presented on !BOOTing the ViewChart disc.

Full details of the use of the MACRO utility are given in Chapter 3 of the ViewStore manual. Essentially, the utility generates a disc file containing data in ASCII format. This can contain both text and numeric information, and it is therefore possible to pass text labels from ViewStore to ViewChart using this file format.

Another advantage of using View Macro parameter files is that they can be loaded directly into the View wordprocessor itself. It is therefore possible to edit data files, or even to create data files directly from View. Details are given at the end of this section.

A sample datafile is included on the ViewChart disc for demonstration purposes, with the filename DLINK. Note that ViewChart will supply this as a default filename when prompting for the datafile, and will use the demonstration file if you simply press RETURN in response to this prompt. If you wish to read data with a different filename, press any key other than RETURN and the default filename will be deleted.

When loaded into View, the structure of a Macro parameter file is as follows:

```
XX Field 1, Field 2, Field 3, Field 4, Field 5, Field 6
XX Field 1, Field 2, Field 3, Field 4, Field 5, Field 6
XX Field 1, Field 2, Field 3, Field 4, Field 5, Field 6
```

Each line contains data relating to a particular record. This is in the form of a series of items of text, separated by commas, corresponding to the contents of each field entry in the database. These fields will have been specified when using the MACRO utility to generate the datafile.

The two letters 'XX' at the start of each line are the identifiers for the macro file, which will also have been specified when using the MACRO utility. They are not significant when used in conjunction with ViewChart.

As an illustration, the demonstration file on the ViewChart disc, DLINK, appears as follows when read into View:

```
MJ .......*.......*.......*.......*.<
XX Jan,1.33,2.30
XX Feb,1.38,2.45
XX Mar,1.46,2.62
XX Apr,1.55,2.42
XX May,1.62,2.34
XX Jun,1.59,2.28
XX Jul,1.64,2.22
XX Aug,1.60,2.31
XX Sep,1.48,2.48
XX Oct,1.36,2.42
XX Nov,1.30,2.37
XX Dec,1.28,2.32
**********************************
```

Table 2: File 'DLINK' as read into View

In order to operate with ViewChart, it is essential that the macro file should be set up according to the following conventions:

1) The first field of each record should contain text information. It will be used by ViewChart to label the intervals along the horizontal axis of the graph or barchart, or to title each pie in the case of a piechart. The text may be up to 25 characters in length, and should contain a maximum of 3 separate words. For barcharts or linegraphs these words will be split onto 3 lines - but note that long labels may overlap if you try to plot too many records at once. If this occurs, you will have to either plot a reduced set of data, or edit the labels in View before plotting the chart, or simply use ViewChart's labelling option to edit the finished chart.

2) Field 1 should be followed by up to 5 fields of numeric data.

3) It is essential that the macro file should contain no more than six fields of data for each record (ie 1 text field, followed by up to 5 numeric fields). If you exceed this number, or mix numeric and text information differently, ViewChart will be unable to read the file sensibly, and will produce unpredictable results!

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Provided you follow these conventions, ViewChart will automatically examine the structure of the data file and will configure the chart accordingly.

Suppose the disc file contains data extracted from R records, with each record supplying 1 text field followed by F fields of numeric data. The relationship between the elements of the disc file and the ViewChart diagram will be as follows:

Piechart:

>R=number of pies (max 5)
>F=number of segments in each pie (max 5)

Stacked barchart:

>R=number of bars (max 24)
>F=number of segments in each bar (max 5)

Grouped barchart:

>R=number of groups of bars (max 12
>F=number of bars in each group (max 5)

Linegraph:

>R=number of points plotted in each line (max 40)
>F=number of lines plotted (max 5)

If the number of records in the file should exceed the maximum values of 'R' as indicated above, ViewChart will simply extract the maximum permitted items of data and ignore the remainder.

Labelling the key

After reading the disc file and plotting the data, ViewChart will ask if you wish to label the key manually, as for ViewSheet files, or if you wish to read the data from a second disc file.

If you select the second option, ViewChart will request the filename for the text data. By default it will supply the filename DKEY- a demonstration file is included on the disc under this filename and can be selected by simply pressing RETURN in response to this prompt.

The text file should be in similar format to a View Macro data file. It should simply consist of up to 5 lines of text, of up to 25 characters in length. The file could either be extracted from the database using the MACRO utility, or else could be created manually from View.

The structure of the demonstration file 'DKEY' is as follows when loaded into View:

```
MJ .......*.......*.......*.......*.<
XX Title for field 1
XX Title for field 2
XX Title for field 3
XX Title for field 4
XX Title for field 5
**********************************
```

Table 3: File 'DKEY' as created from View

To create a file such as this manually, enter the text into View exactly as shown above, keeping one item of text to each line. Use SHIFT-f8 ('Edit Command') to enter the macro identifier ('XX') at the start of each line, and ensure that no blank lines are left at the beginning or end of the text. Then simply save the text under the filename DKEY. Many people will find this easier than using ViewChart's own manual editor.

8 TECHNICAL NOTES

Altering ViewChart

The following brief notes are intended to assist any users of the disc who may wish to modify the plotting routines or add their own routines.

The ViewChart disc makes extensive use of overlays to reduce total memory requirements and to enable it to be compatible with all versions of the BBC Micro. Three main programs - coreM, coreVS, or coreVM - are chained from an initial menu, and must be run with PAGE set to &1900. Each program controls a series of overlays according to the type of diagram to be plotted. These overlays are stored in directory 'O'. All files adopt the convention of using the suffix 'M' for manual version, 'VS' for ViewSheet version, and 'VM' for View Macro version.

All Basic program segments on the ViewChart disc have been compacted tightly to minimise memory requirements. It is essential that any additional or modified overlay routines should not exceed the following lengths:

Manual routines:	&4D0
Viewsheet routines:	&4D0
View Macro routines:	&550

The first line of each overlay should begin with the procedure definition 'DEFPROCplot'. All other procedures or functions defined within the overlay must have a unique title.

ViewChart makes use of two machine code routines. SDUMP is a Mode 0 graphics dump, which must be LOADed and RUN in Page &A00. The second routine, DOTFILL, is a pattern fill routine which uses memory from &1500-&18FF. DOTFILL was first published in Acorn User magazine in January 1985, and full details can be obtained from that issue.

Creating View Macro Files

A View Macro file can as mentioned be generated by ViewStore or by a manual user directly into View. You could also use this interface to harness other programs, by getting them to output data in the required form. The format for a stored command such as 'XX' is an &80 byte, followed by the two ASCII bytes for the stored command,

followed by the text of the line in ASCII. The line is terminated with a carriage return. If you *DUMP a prepared file, the format will be fairly obvious.

80 track disc drives

If you have an 80 track disc drive, prepare a blank 80 track disc. Put the 40 track master disc in your 80 track drive 0, and type:

```
CHAIN "COPY40"
```

The program will ask you which drive the 80 track disc is in. If you have dual drives, put the blank disc in Drive 1 and answer '1'. The transfer will then happen. Afterwards, put your master disc away, and label the new copy. You can then use this as normal.

If you only have a single drive, answer '0'. The program will prompt you to swap discs. When it refers to the '40 track disc', it means the master disc you have bought. The '80 track disc' is your blank disc.

If you have a BBC B with 1770 DFS, BBC B+ or Master 128, you can use the 40 track disc directly in 80 track drives by typing:

```
*DRIVE 0 40
```

The transfer program COPY40 will not work properly on these systems, and should not be used.

Other printers

If your printer is not Epson-compatible, and/or you have a screen dump program that you would like to use instead of the one provided, you can install your own program provided that it will fit into the memory available. This is how to go about it.

If you have a machine code screen dump program which can be assembled to run in memory from &A00 to &AFF, then take the object files, which should start execution at &A00 and be less than &100 bytes long, and name it SDUMP. This should then replace the original SDUMP program on the Viewchart disc. It is probably best to do this with a backup copy of the Viewchart disc.

If you have a screen dump ROM which is driven by a '*' command, for example *GDUMP, then you will need a machine code program which calls this command. Here is a little program that will create such a machine code program. Just substitute your command in line 20.

```
10 P%=&A00
20 c$="GDUMP 0 1":REM or whatever..
30 [LDX #7:LDY #10:JMP &FFF7:]
40 $P%=c$
50 *SAVE SDUMP A00+20
```

Another method of controlling the screen dump is to write a separate program which loads the screen ready for dumping. This also can be used as a technique for other things. For example you might like to step through a sequence of graphs actually on a monitor, for a presentation. The prepared graphs and charts are saved on disc as screen images. You can write your own very short BASIC programs to control the display and printing of them. Say you had prepared three displays called CHART1, CHART2 and CHART3. These can be displayed one after the other with a program like this..

```
10 MODE 0
20*LOAD CHART1
30 A=GET
40*LOAD CHART2
50 A=GET
60*LOAD CHART3
70 A=GET
80 CLS
```

Lines 30,50, and 70 just wait until you press any key. Such a program can also handle screen dumps. If you added a line

```
25*SDUMP
```

you would also print out CHART1.

Finally, if you understand BASIC you might like to alter the Viewchart listing itself. The screen dump program is actually called by line 10200 of file 'O.Util'.

9 PRESENTATION TIPS

Once you have printed out your graph or chart, what is the best way to present it. The standard screen dump supplied produces a large printout which is specifically designed for proportionality ie, the circles come out round. Two other screen dumps are supplied on the disc - one which produces a dump that fits precisely on an A4 page, (stored as A4DUMP) and one that fits on a small page, and is the only one that works with the older Epson MX range (MXDUMP). To use one of these, you should *RENAME the current SDUMP file to some other name, and *RENAME the desired dump file to SDUMP.
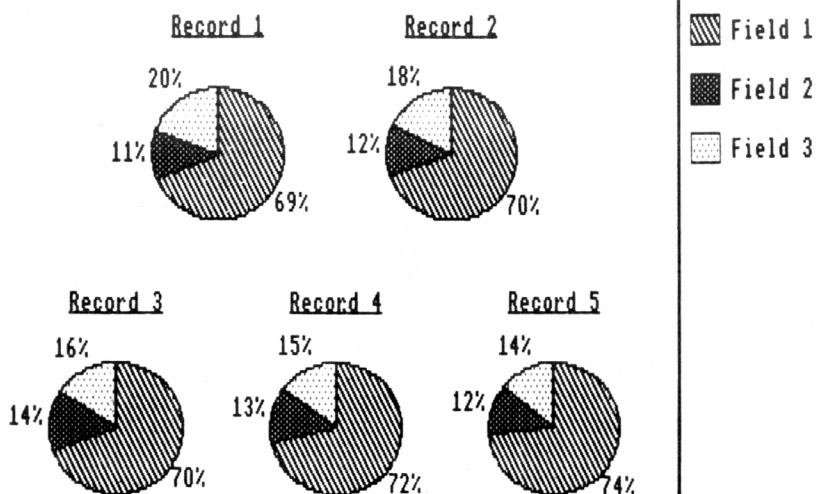
Screen dumps will look good on a new or newish ribbon. Many people who produce screen dumps regularly keep separate ribbons for dumping only, and remove the ribbon again afterwards. This is not always to be recommended as unsealed but unused ribbons have a tendency to dry out.

The large dumps can be reduced in size by using a good quality scaling photocopier. This will often improve their appearance. Also, when incorporating a dump in a printed or typed report, you will probably be sticking the dump down on the typed sheet, and photocopying the complete page. Try to cut the ViewChart dump as near to the border lines as possible, and keep your cuts even. This will reduce the likelihood of marks showing on the paper. Also use glue under the paper instead of sticky tape on the top.
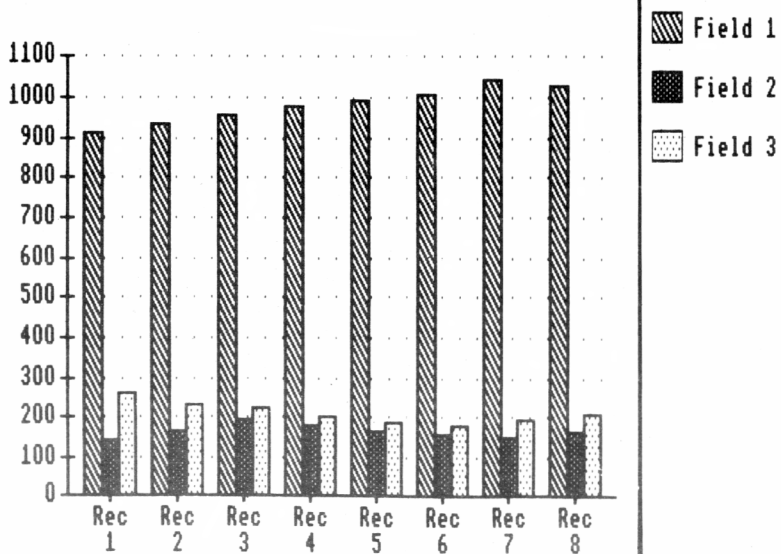
For really professional results, for example to include charts in a proper typeset and bound publication, you should perform the dumps using the large SDUMP program, with a good ribbon, and a good printer. The dump should then be reduced by photo-mechanical transfer (PMT) to the desired size, and finally pasted into place in the normal way. Alternatively, you may leave the photo-reduction to your printing firm, who will probably have better equipment than you. If you have a BBC Micro plotter dump program, and a plotter, you'll get even better results.

The rest of this manual contains example dumps produced using the data from the ViewChart sample files provided. They are identified within the dumps, using the labelling facility provided.
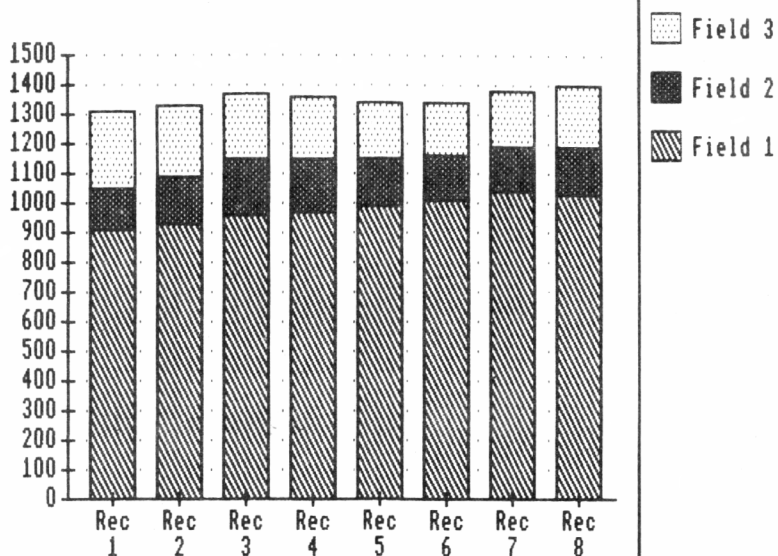
File V.VS1 plotted as piechart

Record 1 — 20%, 11%, 69%
Record 2 — 18%, 12%, 70%
Record 3 — 16%, 14%, 70%
Record 4 — 15%, 13%, 72%
Record 5 — 14%, 12%, 74%

Field 1
Field 2
Field 3

File V.VS1 plotted as grouped barchart

Field 1
Field 2
Field 3

File V.VS1 plotted as stacked barchart

File V.VS1 plotted as linegraph

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