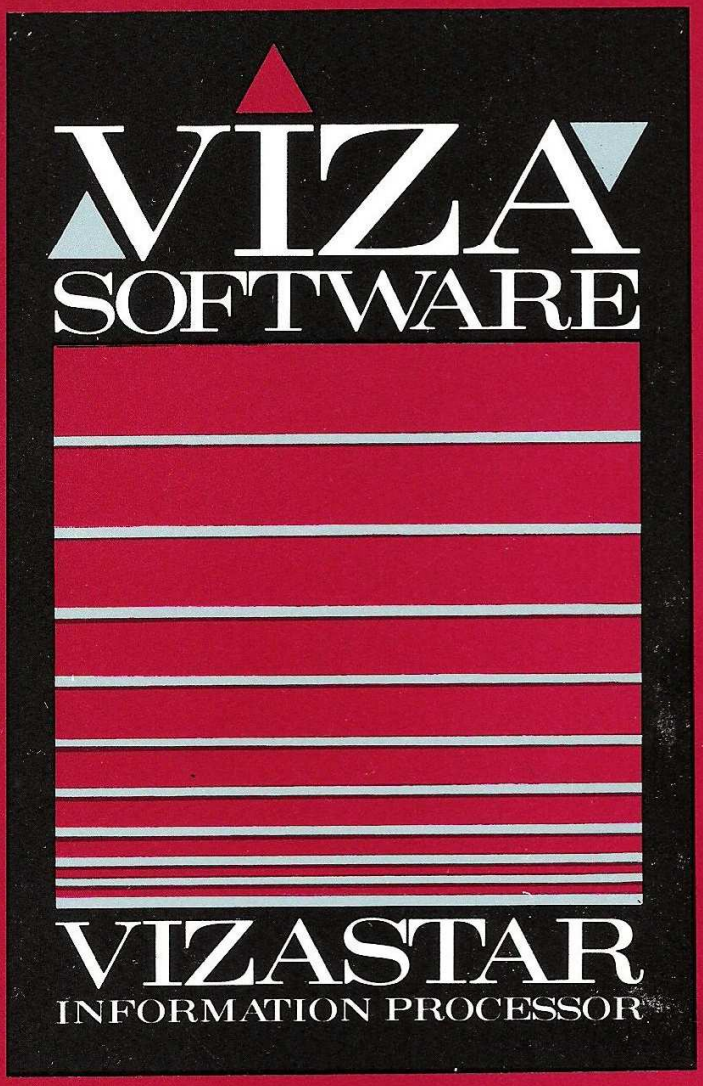

Spreadsheet
Database
Graphics

For Commodore 128

VIZASTAR 128 INFORMATION PROCESSOR

USER REFERENCE GUIDE

By Kelvin Lacy

VIZA SOFTWARE
PART NO. 128VSMOI
FEB 1986

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CREDITS

VIZASTAR was researched, designed, programmed and documented by Kelvin Lacy. Additional design and programming by Michael Bignell.

SECTION I - INTRODUCING VIZASTAR

1.1 AUTHOR'S INTRODUCTION

Having been involved with designing and programming business computer applications for a number of years I have often searched for a low- cost, easy and effective way of compute rising business problems.

If you have a computer and want to type a letter or a report you use a word processor, but if you want to work out bills or keep computerized records what program do you use? Do you hire a programmer? or is there a readymade program that can easily be made to do ALL these things?

In looking at this problem I decided that the 'spreadsheet' approach of a large piece of organized electronic paper would only be of use when properly integrated with a filing system held on convenient floppy disks. And with these two components working and communicating we could have the right tools to get on and do the job.

VIZASTAR is the result of considerable research and development that has progressively evolved into a unique business/home office system.

At this time VIZASTAR is the first product to totally integrate a spreadsheet with a: true disk database. It is a natural integration and one that I am sure you will soon find absolutely invaluable.

As with any powerful tool you will first need to be sure of what you are going to use it for - this is not always easy and you may find that you need to re-design your use of the system several times before you are completely satisfied.

We have included examples in the separate tutorial booklet which will help with the design of your application as well as getting to know VIZASTAR itself. In this manual we first explain the 'concepts' and then a complete analysis of each command, its purpose and its various options.

I know that many computer users do not read software manuals. I have to admit that I don't either and I get quite exasperated when new software doesn't work the way that I think it will.

Well this does it and I am sure it will for you too I!!

But Please Read On....And don't forget to tryout the examples in the tutorial booklet.

1.2 WHAT IS AN ELECTRONIC WORKSHEET?

ELECTRONIC BOXES

Imagine a large piece of paper ruled both across and down, the lines ruled down being known as 'columns' and lines ruled across being known as 'rows'. At each 'cross-over' point a box is formed. The box is known as a 'cell' and it is in these cells that information can be entered. A cell normally contains figures, but with VIZASTAR's integrated disk filing system a cell can just as easily be used to hold, say, a customer name or a product description.

THE SCREEN IS A WINDOW

Because this piece of ruled paper is too large to fit on your television or monitor screen VIZAST AR displays just a section of it at any one time, however as you will see later there is a command that lets you see and work on many different parts of what we call the 'worksheet' through smaller 'windows'.

REFERENCING THE BOXES

As there are so many cells (VIZASTAR has 64,000!) there has to be a naming convention so that you can easily reference individual cells. VIZASTAR gives each column a letter. This ranges from A for the first column through to Z for the 26th column and then AA, AB, AC through to BL for the 64th column.

The rows are simply numbered from 0 to 999. This convention lets you 'address' an individual cell by referring to the column letter and row number as AO for the cell in column A row 0, D20 for the cell in column D row 20 and so on. Throughout this manual you will read about 'cell referencing' and 'cell addressing', they are synonymous terms.

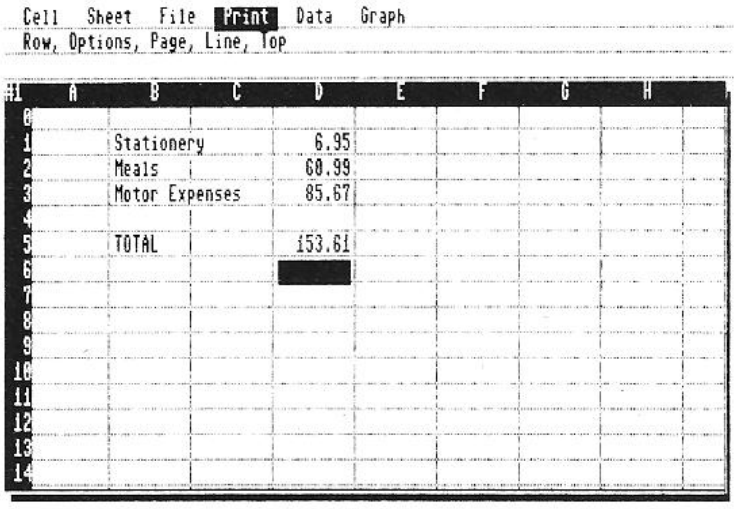

Fig. 1 The Worksheet Display

MOVING AROUND THE WORKSHEET

You will see that the screen 'border' permanently displays the column letter and row numbers. These change as you move around the sheet so you will always know where you are. Your current cell position is shown on the screen by the cell 'pointer' which is normally a small white arrow. The keyboard cursor control keys marked CRSR are used to move this cell pointer around the displayed worksheet. Notice that if you move the cell pointer off the screen VIZASTAR assumes that you wish to see a different part of the sheet and will 'scroll' the sheet up, down, left or right quite automatically.

ENTERING INFORMATION

You can type text or figures into a cell in the sheet; you can also type a formula into a cell. A formula is an instruction to VIZASTAR to calculate a number. The formula can contain just numbers such as '+78+56' or be mixed with cell references such as '+A2+56'. In either case it is the calculated result that is displayed in the sheet (not the formula) the formula is displayed in the screen heading whenever the cell pointer is moved on to the cell. It is important to remember that a cell formula affects the displayed result in that cell. It cannot directly alter the actual CONTENTS of another cell. It can however alter the RESULT of a formula in another cell.

WHAT IF?

You can see that using a cell reference in a formula means that cell results can be made dependent on figures contained in the other cells that they reference. So that by changing the figure in a particular cell your entire sheet is able to recalculate using the new figures. This is how a 'What If?' question is answered by VIZASTAR. In a real life situation cell 'dependencies' can be quite complex and the results correspondingly more powerful.

FILING WORKSHEETS

Because the worksheet is so large you can use the same worksheet for as many uses as will fit in the computer's memory. However the sheet can be saved onto disk as a single file for later use. You can then start a new sheet or perhaps re-use the old one for something new. You can have as many sheets as will fit on a disk by giving each a unique name. It is this name that you use to recall or 'load' the worksheet from your disks.

PRODUCING A PRINTED COPY

VIZASTAR can be asked to send out to your printer a part of the worksheet, so you are able to retain a permanent 'hard copy' of your work. VIZASTAR will also print headings at the top and bottom of each page with a page number if you wish.

1.3 WHAT IS A DATABASE?

This is an extremely difficult question to accurately answer; the term 'database' means many different things to many people. In its established use it means simply just an organized collection of information. It is wrong to assume that a 'database' is fast, efficient or even semi-intelligent. Some database systems can be extremely tedious to use, taking large amounts of disk space up and making it very awkward to access and use your information.

THE VISUAL SOLUTION

The VIZASTAR database holds much of its information in a compact form allowing many more records to fit on the disk than other systems, and because the worksheet sits alongside you have a convenient piece of visible electronic paper to help 'process' and layout your information.

DATABASE STRUCTURE

In the context of a personal computer system using floppy disks a database system is usually made up of a collection of indexed 'files'. Each file is automatically maintained by the database system in alphabetical or numerical order, by a name or a number. VIZASTAR operates in just this way.

FILE LAYOUTS

The layout of each file in the database is initially 'setup' by the user of the system. It is at this stage that each item or 'field' of information is identified in the 'file layout'. The system then lets the user draw the equivalent of a filing card on the computer screen, this is then used later as a screen layout to enter or recall information 'records' from the file.

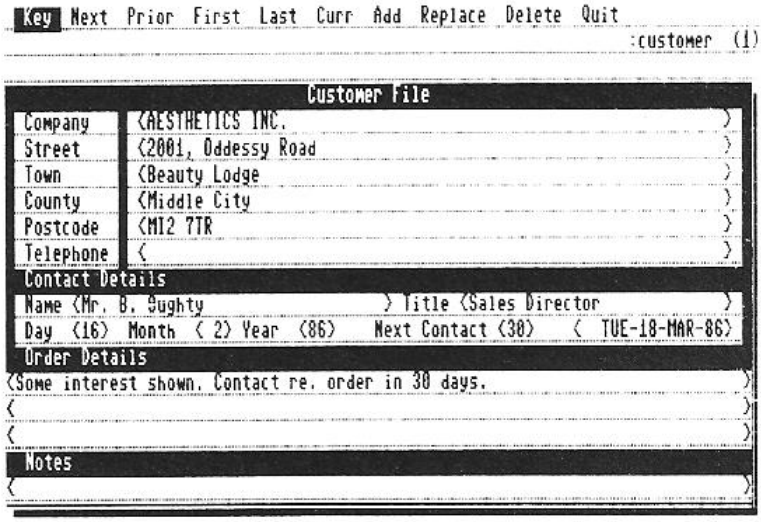

Fig. 2 The Database Record Display

INSTANT ACCESS USING A 'KEY'

One of the fields in the layout is defined as the ‘key’; this is used by the database system to keep the information in the file in strict alphabetic order. When recalling an information record from the file this 'key' can be used to gain almost immediate access to any record within the file.

ACCESSING EACH RECORD IN TURN

A database system also allows you to go consecutively ('sequentially') through each record in the file, so that you can list or process your information records one after another, each being alphabetically in order.

DESIGNING YOUR DATABASE

The hardest part of using a database system is that you have to decide what kind of 'structure' your information has before you can actually enter it in. There are some general design rules but you would be advised to purchase a book explaining the theory behind database design if you want to get it absolutely right, or if your use is likely to be complicated. The penalty to pay is that you will not be able to use your database efficiently. Certainly uses that you may have in mind for the future will just not be possible.

DESIGNING A MAILING LIST

If you just want to hold a mailing list, disk record library or similar set of information then the design is quite straight forward, as you can simply place all the data items (fields) in one file layout. Your 'key' would be the name or title of each customer or disk record.

DESIGNING STOCK CONTROL/ACCOUNTS

If you want to set up stock control or run your accounts then you should first plan out your files and how they interact. Remember that the database you design is ba5.ed largely on the order in which you need to access the information. If you miss one or two items of information or put items in a file in the wrong order they can easily be sorted out later.

INTRODUCING SOME DESIGN APPROACHES

The rest of this section (up to the summary) should be skipped over if you are reading this for the first time. We don't want to put you off so early on in your reading so come back to this section later if you wish.

RELATING ONE FILE TO ANOTHER

In any database application you will find that much of the information that you want to hold is 'related'. It is the MOST related information that is put into the same file layout when you 'setup' database files.

RUNNING A BOOK STORE

So if you ran a book store and wanted to hold a book catalogue in a database you would store the title, author and price all in the same file. However as you also need to buy these books from the publisher you may be tempted to hold the publishers name, address, telephone number etc. in the same record. But this means that you will DUPLICATE this information for every book that you stock from that publisher. The answer here is to have a separate publishers file where the publisher's address, telephone no. etc. are only stored the once.

The relationship between the book file and the publishers file is established by holding the 'key' (probably the publisher's name) to the publishers file in the book file layout. This dramatically reduces the amount of duplicated information and means that you can call up a book and all the publisher's details in just two database requests.

MAKING THE DATABASE FLEXIBLE

In the above example we discussed how to establish a relationship between one file of information and another, the effect of this was also to reduce duplicated information. Another important benefit of this reduction is that if the publishers details need to be changed (change of address, telephone etc.) you only need to change one record in one file. Otherwise it would mean changing ALL the book records for that publisher.

FURTHER RELATIONSHIPS

Continuing our design example you may wish to produce a list of all books for a particular publisher. One way of doing this is to hold the 'key' (probably the book title) to the book file for each and every book that the publisher handles.

So a publisher’s record may then contain: name, address, telephone and book title 1, book title 2, book title 3 and so on. This means there will be some duplication of information but it is necessary in order to 'key' into the book file for further information about the book i.e. the author, price, and publication date.

SUMMARY

So you can see that a personal computer database system is really making the maintenance and access of record files a very simple matter. It finds the space in its disk filing cabinet and then files the information under your own heading in exactly the correct place. It's ready for instant reference.

The VIZASTAR database system operates just like this, but unlike other systems VIZASTAR has a full scale spreadsheet program right alongside. This will allow you to 'lift out' your records from the disk filing cabinet into a powerful calculating and report creation tool.

It is very important to understand that the success of your use of the VIZASTAR database is a result of good design. This means that you must plan out the uses that you will put your database information to, and design your file layouts accordingly.

The separate tutorial booklet uses examples which may help you to understand more about the setting up and use of VIZASTAR databases.

SECTION 2 - GENERAL INSTALLATION INFORMATION

2.1 THE PROGRAM DISK/CARTRIDGE

VIZASTAR 128 is a spreadsheet, database and graphics program for use on the Commodore 128. It is supplied on a disk, plus a ROM cartridge. To run VIZASTAR you need a C128, a 1541, 1570 or 1571 disk drive, an 80 column color or monochrome monitor and a printer.

TO LOAD UP VIZASTAR 128 -

Turn the computer OFF, push the 40/80 Display switch down.

Turn the printer ON.

Turn the disk drive ON.

Plug the VIZASTAR ROM cartridge (label upwards) firmly into the cartridge socket of the computer (or approved IEEE interface).

Insert the VIZASTAR system disk in the drive and close the door flap.

Switch the computer on, VIZASTAR 128 will now boot from the system disk. Depending on the disk drive model, this will take between 30 seconds to 3 minutes to load in.

DON'T FORGET TO LOAD THE 'READ ME' WORKSHEET. IT MAY HAVE VITAL INFORMATION RELATED TO YOUR USE OF V/ZASTAR.

TO EXIT FROM VIZASTAR There is NOT a 'return to BASIC' command. It is therefore necessary to switch off the computer at the end of a VIZASTAR session. Wait a few seconds and switch back on to return to BASIC.

2.2 COPYRIGHT AND ILLEGAL COPYING

Users, dealers and other interested parties are reminded that this software is licensed to purchasers of this product. This license forbids the copying of the software and manuals. VIZA SOFTWARE has and will continue to take legal action against infringement of this license in any country. Illegal and 'broken' copies of our software will have inadequate memory available and will not operate correctly, causing considerable problems in loss of data.

This product is attractively packaged in a strong plastic box with a manual that is clearly printed and is not photocopied. The disk has a color label with the VIZA SOFTWARE logo printed on a black disk sleeve. If the product you are using has not been supplied in this way you should return the goods and report the matter to us in England.

2.3 TYPICAL PRINTER CONFIGURATION

VIZASTAR is a disk based program for use on the C-128. Almost any type of printer can be interfaced to the 128 for use with VIZASTAR. However there are many considerations in choosing a printer. VIZA SOFTWARE supports the CENTRONICS PARALLEL standard and all our software will work with printers that use the CENTRONICS PARALLEL protocol. A low cost cable is all that is needed to connect such a printer (contact us for suppliers) and we can supply that to order.

Naturally, our software is compatible with all CBM printers that function correctly.

Because VIZAST AR can print in true high resolution we have built this facility to work specifically with the EPSON FX/80. If you wish to print in letter quality we recommend the JUKI 6100 for price and performance. The GRAPH MULTIBAR and GRAPH PIE graphic displays can be printed to a wide range of dot-matrix printers - EPSON, STAR, SHINW A, MPS-801, MCS-801 (color printer) and BROTHER.

RS-232 Serial printers/typewriters can be interfaced by purchasing a special cable. This plugs straight into the user port. Contact us for your nearest dealer.

2.11 CONNECTING DIFFERENT DISK DRIVES

The CBM 15111/1570/1571 drive is directly connected to the 128 serial/IEEE socket. VIZASTAR can be used with Commodore parallel/IEEE disk drives by using the BRAIN BOXES IEEE cartridge (contact us for availability). When ordering this cartridge ensure that you ask for an extension cartridge socket to be fitted.

If you have any problems or queries related to connecting, various equipment please contact us for up to date information on suitable interfacing.

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SECTION 3 - VIZASTAR SYSTEM OVERVIEW

This overview explains the general operation of the information processor; its purpose is to provide a background to the system so that you may gradually build a complete understanding of how to use VIZASTAR and its many facilities. PLEASE read this before using the program, it will help you later.

3.1 STARTING THE SESSION

VIZASTAR automatically boots from the system disk. Whilst this is taking place the VIZA SOFTWARE logo is displayed showing the copyright message.

Once loaded, the system diskette is normally removed and a user diskette inserted in the drive. If you wish to call up the supplied TUTOR worksheet then leave the system disk in the drive. The software version number may be found by issuing the FILE $LIST command – it is the number after 'vs.', which is the VIZASTAR program filename.

VIZASTAR remains resident in the computer memory for the entire session. You will only need to place the system disk back in the drive when printing from the graphics commands GRAPH PIE and GRAPH MULTIBAR. Worksheets and databases can be placed on any disk and will not interfere with existing files produced by other software products.

3.2 THE MENU SYSTEM

Practically all VIZASTAR commands are called up from the menu system. Certain frequently used operations are invoked directly using the function keys. When VIZASTAR is first loaded you will see the worksheet display and the cell 'pointer' pointing to the first cell in the sheet.

The CBM key (printed with the Commodore logo) is used to call up the main menu line. Press and release this key. The menu line is displayed at the top of the screen and shows a line of command 'words'. Pressing the SPACE BAR highlights each of the command words in turn, pressing SHIFT and the SPACE BAR together highlights the previous command word. A command is selected by highlighting it and pressing the RETURN key. Alternatively you can just press the key corresponding to the first letter of the command word.

Because there are so many different operations they are split under six main headings which then lead into a further level of headings. As you point to each heading you may see a further level of headings displayed underneath, this continues until the required command is reached and then carried out.

As the screen width is limited some command word lines continue on down to the next line. Note that the current level of command words are shown separated by spaces whereas the 'next level' headings are separated by commas.

As with all VIZA SOFTWARE products, the STOP key can always be used to terminate the current operation. It is never used for any other purpose.

The menu system 'remembers' the last command that you successfully used and will point to that command the next time you use the menu system. As with many other options that can be set in the system VIZASTAR associates these with the current sheet so that when you call up the sheet from disk these system 'parameters' are set back to 'where you left off'.

When using some of the database commands you will 'stick' at that level until you decide to return. These are explained later.

3.3 USING THE WORKSHEET

In the earlier 'What is an Electronic Worksheet' section we talked about the concepts of a spreadsheet program, the way it can be used in setting up calculations to be carried out quite automatically based on figures held in its columns and rows. In this section we shall be explaining more about the basics of a VIZASTAR worksheet.

THE WORKSHEET STRUCTURE

The sheet is sectioned into 1000 rows numbered from a through 999, each row is divided into 64 columns lettered from A to BL. Each sheet column can be varied in width from 3 characters up to 75 characters.

Each cell can contain text, a number or a formula. Each cell can be set to display its contents in different 'formats'. So that you could enter say '100' into a cell and if its format is set to currency then it would display the value as '100.00'.

There are eight kinds of format that you can use, left justified text, right justified text, centered text, integer, currency, date, scientific and 'general' which is the default number format.

The detailed reference section explains the full meaning of these format types under CELL FORMAT.

WORKSHEET HEADING LINES

At the top of the worksheet screen are the heading lines, these contain important information about the name of the sheet, and the content of the current cell and its format. The percentage of free worksheet memory is also shown in the heading. Notice that as you move the 'cell pointer' (the highlighted cell) around the sheet, the heading lines change.

WORKSHEET MODES

When using the sheet there are four distinct 'modes' of operation. These are 'READY', 'EDIT', 'POINT' and the command menus. VIZASTAR is normally in the READY state so that you can simply move around the sheet using the CRSR or function keys to display any part of the sheet on the screen.

If you start typing a number or text VIZASTAR automatically switches to 'EDIT' mode and you will see your typed entry appearing in the screen heading. You can see therefore that switching from one mode to another is quite automatic when entering information into the cells. If you wish to amend the contents of an existing cell you can press the F I function key to switch from 'READY' to 'EDIT', you can then use the CRSR keys to move around you existing cell entry and amend it as required.

ENTERING TEXT, NUMBERS AND FORMULAS

As you type in your cell entry VIZASTAR automatically checks to see if you have typed a number or text, if you wish to enter a formula it should be preceded by a '+' or '-' sign otherwise it will be treated as text and not calculate. If in the rare circumstance that you wish to have a number or formula treated as text. It can be preceded by a single quote ('+A54) or ('123.23).

Also use the single quote (') if you want to enter and keep leading zeros in a cell or database field, such as the ZIP code in the U.S. This is because if you enter 01234 it will re-display as 1234. A cell containing a number that is preceded by a single quote cannot be used in a formula.
Numbers are considered invalid if they contain commas, so that 34,552 should be typed as 34552.

If the column that the cell appears in is too small to show the number that you have entered: VIZASTAR first attempts to display the number in scientific notation (see CELL FORMAT for definition of the scientific format). If it still cannot display the number - 'greater than' symbols are displayed instead. Such as: '>>>'.

COMMANDS TO MANIPULATE THE SHEET

There are many commands that are used to manipulate the contents of your sheet. These let you copy or move cell entries, insert or delete whole rows or columns and even to sort rows into a particular order. Because there are so many commands they are split into CELL RELATED and SHEET RELATED. The main menu says:

CELL SHEET FILE PRINT DATA GRAPH

The CELL and SHEET options direct you to the main sheet manipulation commands.

SAVING YOUR WORKSHEET TO DISK

Your worksheet is held temporarily in the computer memory and therefore once you have a sheet that you wish to retain it must be FILED onto disk. VIZASTAR always saves the entire sheet onto disk. In addition to saving the cell entries VIZASTAR also saves window settings, cursor position, menu choices and the screen colors plus any printer options that have been set.

So you can see that your use of the VIZASTAR worksheet is quite straight forward, the many commands need only be used when you are more familiar with the system and because they prompt in ENGLISH they are soon understood. Each command is fully explained in the later detailed reference sections.

3.4 USING THE DATABASE

In the 'What Is A Database' section we explained the principles of a 'database' system on a personal computer using floppy disks. The VIZASTAR database is such a system and enables you to easily reference and maintain your information on disk. Because VIZASTAR is an integrated system the database operations are called up from the main menu.

ORGANISATION

A VIZASTAR database is a collection of up to 15 files created from within VIZASTAR. These files cannot be directly accessed from outside of VIZASTAR, but they can have their contents 'exported' as a standard sequential file (for use with other programs such as the VIZAWRITE or EASYSCRIPT word processors). You can also IMPORT sequential files into VIZASTAR from other database systems or your own BASIC files.

SETTING A FILE UP

Before you can store information into a VIZASTAR database file the layout of the file has to be 'setup', it is at this stage that you design your screen 'cards', typing descriptive information and identifying the start and end position of each item of information on the screen 'card'. You can have up to 9 screen 'cards' that make up your complete record layout. This is then stored on the disk so that whenever you wish to ACCESS your file the same screen 'cards' will be displayed for you to enter or amend selected records in the file.

REFERRING TO YOUR FIELDS

When setting up a file layout you need to give each field a letter code ranging from A to BL. The A letter code is also used to identify that this is the field to be used as the KEY field. There is a single key field and the complete file layout must contain such a field. These letter codes are used internally by VIZASTAR and make it possible to TRANSFER information between the same lettered columns in the worksheet and the database. You can also reference the current database record directly in worksheet formulas by mentioning just the field letter code instead of the usual column/row notation.

REFERRING TO YOUR RECORDS

Once your record layout is setup you are ready to enter information into the screen 'cards' and ADD them to the database file. As you ADD your information records to the database they are automatically stored by VIZASTAR in ascending alphabetical order. You can then browse forwards or backwards through your file or pick out a single record by its 'key'. At any time you are able to change the contents of the currently displayed record and REPLACE the existing record with any changes you have made.

TELLING VIZASTAR WHICH DATABASE FILE TO USE

When you wish to use a database within VIZASTAR you select the DATA command in the main menu. If you have not been using a database file in a VIZASTAR session you need to tell VIZASTAR which DATABASE and which FILE you want to USE. If you want to switch to another file in the same database you only need to tell VIZASTAR the name of the FILE that you wish to USE. VIZASTAR always remembers your position in the last three files used. The significance of this will become apparent later as you understand more about the capabilities of VIZASTAR.

USING A DATABASE FILE FOR THE FIRST TIME

When you USE a DATABASE or a FILE that is not held on the diskette you are using VIZASTAR asks you whether you want to create it. If it was a DATABASE then VIZASTAR sets up its own database directory ready for when you want to USE a FILE within it. If it was a FILE that is not known then VIZASTAR switches into its file SETUP mode.

It is here that you design the screen 'cards' explained earlier. You will see that there are special commands to help you SETUP your layout and that once it is complete you SAVE it and then say QUIT to .return back to the familiar worksheet. The next time you say DATA ACCESS - VIZASTAR will re-present your layout card. By then selecting ADD you are able to fill out the information for a record and then press F I to physically add the information into the current database file.

3.5 USING THE GRAPHICS

The standard graphics facilities in VIZASTAR are extremely effective in showing trends visually that are not as obvious as lists of numbers.

GRAPH WINDOWS

A BAR graph is always drawn in the 'window' where the cell pointer is positioned. We have not yet discussed windows in any detail but if you look at the front cover of the manual box you will see that the screen has been sectioned into two parts. Each part is known as a 'window' and when VIZASTAR is first used there exists just the one 'window' which takes up the entire screen display. It is possible to section any part of the screen into a maximum of 9 'windows'.

WHAT TO GRAPH

Getting back to graphing - you can choose anyone of these windows to be used to display a graph of a range of cell entries. This range of cell entries can be part of a row or part of a column in the sheet. If you have set CELL AUTO CALC then as you change numbers that have been 'graphed' you will see your graph re-draw quite automatically. If you SAVE a worksheet with a graph display - it will set itself back up again when you recall it later.

PRINTING YOUR GRAPH

On EPSON compatible printers you are able to print out a full hi-resolution screen copy of your worksheet graphs.

PIE CHARTS, 3D BAR GRAPHS

PIE and MULTIBAR graphs allow more professional presentation of the figures in your worksheet, using the whole screen and in full color. To draw a MULTIBAR or PIE graph, simply type any descriptive headings across a row of the worksheet, and enter up to 4 rows of numbers underneath for MULTIBAR graphs, or a single row for PIE charts. Unlike the BAR graphs - PIE and MULTIBAR can be printed on a much wider range of printers including the MCS-801 color printer.

3.6 AUTOMATING YOUR WORK WITH 'EXECS'

Earlier we explained the VIZASTAR menu system and how to select commands by SPACING over and pressing RETURN or by simply pressing the corresponding command letter key. Commands and other keystrokes can also be 'executed' from within the worksheet quite automatically and even conditionally, rather like a programming language. However it is much simpler than a programming language but many times more powerful when combined with all the VIZASTAR features.

For instance if you are using the SHEET and wanted to INSERT a ROW you would normally press CBM SIR which selects SHEET (S) INSERT (I) ROW (R). If you were to type /SIR into a cell you can 'execute' the command sequence from that cell. Clearly a ~ command executed in this way is of little benefit but if you consider the combination of many command sequences it provides the power to perform complex processing of both worksheets and database files with just a few command sequences.

This 'EXEC' facility is covered in much more detail later and you will also find useful examples provided on the tutor worksheet.

3.7 PRINTING WORKSHEETS

You are able to print from different parts of the worksheet, and have VIZASTAR automatically print headings and footings with each page numbered. VIZASTAR's print command always knows where on the printed page you have reached, so that pages can be built up from different parts of the sheet. This lets you easily build up a report without having to be concerned about line or page endings.

3.8 PRINTING DATABASE INFORMATION

A REPORT command is included in VIZASTAR to automatically print out each record in turn from any of your database files. The REPORT RANGE option accesses each database record in turn and then prints out from a part of the worksheet that you identify. This part of the worksheet would contain references to the database record and perhaps references to cells in the worksheet. This is where the database and spreadsheet components of VIZASTAR integrate to become especially useful. The TUTORIAL manual has examples of the various REPORT options.

3.9 REFERRING TO TEXT CELLS

Earlier we explained how a NUMBER cell is referenced by using the column letter followed by the row number. For numbers the cell reference is preceded by a plus or minus sign, such as +a10. However you may wish to have a cell refer to a TEXT cell, especially when using the REPORT RANGE command. This is achieved by placing an '=' equals sign in front of the cell reference.

For example, by typing =A10 into a cell, it will always display whatever cell reference A10 holds. This 'text cell referencing' cannot be made the result of formulas; it can only ever appear on its own in a cell. Note that you don't need to recalculate the worksheet to show a text reference that has changed.

3.10 SUMMARY

The purpose of this section has been to provide an overview of VIZASTAR's capabilities and to give you a 'feel' for the way in which it is used and how to navigate through it. Obviously it has been necessary to talk about some features in detail and you may have some un-answered questions, all these points are covered in detail in the later reference sections.

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SECTION 4 - WORKSHEET FORMULAS

4.1 INTRODUCTION

The VIZASTAR worksheet can do a great deal more than just record figures and text in an attractive column/row structure. In this section we will be covering the worksheet facilities in great detail. VIZASTAR is a sophisticated tool which becomes more powerful as you get to know its many capabilities. It is unlikely that this will all be crystal clear on a first reading; so be prepared to re-read this section several times leaving the more detailed parts until you become more experienced.

THE DISPLAYED VALUES

As you may have already understood - each cell in the worksheet can contain a piece of text or a number. This is displayed in the current cell FORMAT. So you can have cash values displayed as pounds and pence (or dollars and cents) in what is known as CURRENCY format. Or perhaps you are dealing with straight whole numbers - so you would choose the INTEGER format which suppresses the display of fractions. Although these values are displayed in different ways VIZASTAR still retains internally their correct and precise values. So at any time you can alter the CELL FORMAT without having to re-enter the number again. The CELL FORMAT and SHEET GLOBAL FORMAT command descriptions explain all display formats.

FORMULAS

In any worksheet cell you can enter a FORMULA, this instructs VIZASTAR to CALCULATE a number rather than just display the numbers in the formula.

For example you may wish to list and total up your electricity charges for the past year. You could put each of these into a column one after another. In the last cell you want to have the total appear so you type in a formula such as this:

B5:+120.56+162.58+99.86+87.98

	A	B
0	* ELECTRICITY*	
1	JAN	120.56
2	APR	162.58
3	JUL	99.86
4	OCT	87.98
5	TOTAL	470.98

And after you press RETURN a total of 470.98 is shown in cell B5. This is quite acceptable and shows how similar it is to enter a formula in the same way as you would enter a single number.

However as the numbers had already been typed into the worksheet could we not have re-used them in some way?

Yes I! - instead of entering the actual numbers you can tell VIZASTAR which cells to reference:

B5:+BI+B2+B3+B4

	A	B
0	* ELECTRICITY	*
1	JAN	120.56
2	APR	162.58
3	JUL	99.86
4	OCT	87.98
5	TOTAL	470.98

And VIZASTAR will look up the numbers at these cell 'addresses' and include them in the calculation. This is simpler and less prone to error and provides us with an example of the power that formulas can provide IF YOU CHANGE THE NUMBERS IN THE REFERENCED CELLS ALL FORMULAS AUTOMATICALLY PICK UP THOSE CHANGES WHEN THE SHEET IS RECALCULATED (Press F7).

This is how you set up your worksheet to perform the famous 'WHAT IF?' situations. Just change a number, ask the worksheet to re-calculate (F7) and see the accumulated effect instantly.

Formulas must be entered into a cell starting with either a + or – sign and can include cell references, numbers and formula functions (explained later).

INVALID ENTRIES

Spaces are not permitted in a formula. If a typing or syntax error is found in your formula VIZASTAR says 'Invalid Formula' and positions the cursor where the error was found. VIZASTAR will not allow an invalid formula to be entered into the worksheet. Press the STOP key to abandon the entry of a formula.

THE RIGHT LETTER CASE

When typing formula functions such as @SUM and @AVG, and logical operators such as # AND#, they must be typed in lower case, although for the purposes of readability we will be showing them as upper case in this manual. Cell references can be typed in any letter case, VIZASTAR always re-displays them as upper case. You will find the combination of lower case functions and upper case cell references make formulas easier to interpret on the computer display.

4.2 CELL ADDRESSING

ENTERING A CELL ADDRESS BY POINTING

In the above examples the cell references were typed directly into the formula, but VIZASTAR makes formula writing even easier by allowing you to move around the sheet and 'point' to cells to be written in to the formula. During formula typing you can press the Fl function key to re-activate the cell pointer and enter POINT mode. When you are in POINT mode the current cell reference is simultaneously written into the current formula AS YOU MOVE AROUND THE SHEET with the cursor keys, F3/F4 and HOME. As soon as you press a non-cursor movement key such as '+' the cell pointer is de-activated and 'normal service' is resumed. So that after each non-cursor movement key, press F1 to resume POINT mode.

Using POINT mode to build up formulas is easier and less prone to error than manually typing each cell reference.

For example:

+A1+B1+C1

Press F1 after each '+' sign to use the POINT mode.

WHAT'S BEHIND CELL ADDRESSING

Later on you will find out how to re-arrange your worksheet, open up new columns, copy cells around the worksheet and more. To appreciate what we are about to tell you it will be helpful for you to consider the potential problems raised when worksheet formulas are re-located. Quite simply they would lose their meaning if they were shuffled around the worksheet 'as is'.

If a new column was inserted before column B, the contents of column B become the contents of column C; the contents of column C become the contents of column D and so on. So in our example the formula +B1+B2+B3+B4 would now refer to the new (and empty) column Band the formula itself would now be appearing in cell C5.

To overcome these kinds of problems VIZASTAR will automatically adjust cell references if the worksheet is re-arranged. So formulas will continue to make sense even though they or the cells they reference have been relocated.

So in our example - although the formula has been pushed into column B and also the cells that it references, VIZASTAR would change the formula to read:

C5:+Cl+C2+C3+C4

So you see that VIZASTAR treats cell references in formulas as RELATIVE to their positions in the sheet rather than a fixed ABSOLUTE cell address that never changes.

Later you will find out how to COPY cell contents (numbers, texts and formulas) to other locations in the worksheet. If we copied our example into columns C and columns D, VIZASTAR will adjust the formulas automatically so that they become consistent RELATIVE to their new location.

If: C5:+CI+C2+C3+C4

Is copied into column D it would become:

D5:+DI+D2+D3+D4

So if you want the same basic formula in many different places in the worksheet VIZASTAR will automatically adjust the formulas.

4.3 ABSOLUTE REFERENCES

There will be times when you'll want VIZASTAR to treat cell references as fixed - so that if you copy the formula around the sheet it will still refer to the same cell. This kind of cell referencing is called ABSOLUTE.

For instance if you wanted to calculate a fixed discount for several products you would set up the discount rate in one cell and several almost identical formulas - one for each of the products. Rather than typing in the same formula over and over again you could COPY it. As VIZASTAR copies each formula it will automatically adjust cell references as already explained.

HOWEVER you would not want the discount rate cell reference to be adjusted, so you need to tell VIZASTAR to leave a particular cell reference alone. VIZASTAR needs the dollar sign $ to identify a cell reference as ABSOLUTE. So in our example, if C0 contained the discount rate and cells C1 to C3 contained the recommended product prices we could use the formula:-

+C1 *$C0 in cell D1

and after COPYing it into cells D2 and D3 VIZASTAR would put:

+C2*$C0 in cell D2
+C3*$C0 in cell D3

There are times when VIZASTAR WILL change ABSOLUTE cell references. This occurs only when the cell that is referenced ABSOLUTELY is moved. This can happen if you INSERT, DELETE or MOVE rows and columns.

4.4 CELL RANGES

Often you will need to refer to a whole part of the worksheet; you will need to do this in both formulas and in many commands. There are several different 'shapes' that can be made when specifying a cell range and It is Important to understand just how VIZASTAR interprets these 'shapes'.

There are three basic 'shapes' that a range can have: column, row or rectangular. VIZASTAR sets the 'shape' based on the range that you set. When you enter a cell range you give VIZASTAR the top left hand cell address followed by the bottom right hand cell address.

For example: C0:E5

REMEMBERING THE SHAPE

If the cell addresses both have the same column letter then the range has a 'column' shape, if they both have the same row number then the range has a 'row' shape otherwise the range is a rectangle shape.

USING CELL RANGES IN FORMULAS

VIZASTAR can also calculate with whole ranges of cell values as well as specific ones. However you cannot simply say +C0:E5 to add up a range of cells. Instead you deal with ranges by using special VIZASTAR functions. These functions are always preceded by a '@' symbol to distinguish them clearly. These are all explained later, but for now here are some examples:

+@SUM(C0:E5)	Adds up the values of all cells in the C0:E5 rectangle.
+@AVG(C1:C5)	Calculates the average of all values in rows 1to 5 of column C.
+@MAX(C2:G2,650,H1)	Finds the maximum value in row range C2:G2, 650 and single H1 cell.

ABSOLUTE CELL REFERENCES IN FORMULAS

Just as a cell address can be RELATIVE or ABSOLUTE so can a cell range. It works in exactly the same way:

+@SUM($C0:$E5)	Adds up the values of all cells in the C0:E5 rectangle.
+@AVG($C1:$C5)	Calculates the average of all values in rows 1 to 5 of column C.
+@MAX(C2:G2,650,$H1)	Finds the maximum value in row range C2:G2, 650 and single H1 cell.

4.5 CHANGING FORMULAS

MAKING CHANGES TO FORMULAS

In the same way that you are able to change a piece of text or a number, you can change a previously entered formula. When you want to alter an existing cell entry you need to go into EDIT MODE. Press the F1 function key to enter EDIT MODE from the normal READY state; you will see the cursor move onto the top of the screen over your cell entry. You will stay in the EDIT MODE until you press RETURN to confirm the alteration or press STOP to abandon any alterations. While in Edit Mode you may use the following keys:

INST	-	Insert a space
DEL	-	Backspace and delete
CRSR LEFT	-	Move cursor left
CRSR RIGHT	-	Move cursor right
HOME	-	Move cursor back to its home position
HOME HOME	-	Move cursor and the entry back to its home position.
CLR	-	Erase all characters from current cursor position onwards.
F1	-	Enter 'Point Mode'
F2	-	Enter absolute 'Point Mode' ($ prefix)

POINT MODE

When you are typing in a formula you can use the POINT Mode to assist in building up cell references. Press the F1 function key and then use the CRSR keys to move the normal cell-pointer around the sheet. As you move over each cell its address is automatically placed in the formula. To escape from POINT Mode you should press an operator key (+ - / *) a bracket or just F1 again to return to Edit Mode.

Press F2 if you want to enter POINT Mode and have an ABSOLUTE cell reference included in your formula.

11.6 USING OPERATORS IN FORMULAS

By now you are probably well aware that VIZASTAR can do the 'basics' as well as the many powerful facilities we have begun to describe. Well there are some basic rules to be followed even when using the simple mathematical 'operators'. These are now explained.

When entering a formula you can use the basic operators - plus, minus, divide and multiply. However, because this is a computer keyboard you won't find the normal divide and multiply symbols. Instead, for divide you type a '/' and for multiply you type a '*'.

To Add use the '+' key
To Subtract use the '-' key
To Multiply use the '*' key
To Divide use the ‘/' key

So in a formula you could type: +C4*3+4/2-2

and VIZASTAR would multiply the number at cell C4 by 3 and add it to 4 divided by 2 and then subtract 2. Giving a result of 12 if cell C4 contained 4.

THE CALCULATION ORDER

When you use a calculator (and some other spreadsheet programs too !) each part of a formula is evaluated (worked out) as it is entered from left to right. So a formula such as:

+4+2*7	A calculator gives the answer as 42
	But VIZASTAR gives the answer as 18

Puzzled? Well this is because VIZASTAR gives each of the mathematical operators an 'order of precedence'. In our example VIZASTAR will evaluate the multiplication first so that the +4 is added to 14 (2*7). On the other hand a calculator would first add the 4 and the 2 together giving 6 and then multiply that by 7 giving a result of 42.

For example:

+4+6*2+3-4	=15	(calculator says 19)
+50-3*10	=20	(calculator says 470)

This priority system applies equally as well to cell references. Below is a list of the priorities that the various operators have:

UP ARROW	Exponentiation	1
*	Multiplication	2
/	Division	2
+	Addition	3
-	Subtraction	3

Where 1 is the highest priority and 3 is the lowest priority.

USING PARENTHESES TO CONTROL THE ORDER OF CALCULATION

If you want to have tighter control over the calculating order then you use parentheses around the parts of the formula that you want evaluated together. For example:

+50-(3*10) = 20

Is quite clearly 'take 50 and subtract 30', so that if you are unsure about our discussion on operator priorities just use parentheses around the parts of the formula you want to be evaluated in a particular order.

You may also use parentheses within parentheses; these are called 'nested parentheses' and give you even greater control. For example:

+(50-(3*10))*2 = 40

This forces the 3*10 to be evaluated first and then subtracted from 50 giving 20. The 20 is then multiplied by the 2 to give 40.

LOGICAL OPERATORS

So far we have discussed operators that are used in straight arithmetic calculations. These ARITHMETIC operators are used in calculations to produce an intermediate number result. VIZASTAR has another set of operators which are termed LOGICAL operators. These produce a special kind of result that is considered to be either TRUE or FALSE, a kind of yes/no answer.

These logical operators are helpful when you wish to vary a calculation based on whether a certain condition is either TRUE or FALSE.

Some examples:

+C5=63	'is cell C5 EQUAL to the value 63'?
+C8<>98.25	'is cell C8 NOT EQUAL to the value 98.25'?

Both these statements could produce either a TRUE or a FALSE result.

VIZASTAR will evaluate LOGICAL statements such that the TRUE condition has a value of 1 and the FALSE condition has a value of 0. So if you entered such a formula as in our example - the worksheet would display the result as either a 1 or a 0.

You will see later that you can refer to a LOGICAL result as either TRUE or FALSE; you need not be concerned that VIZASTAR knows them internally as numbers.

Soon we will be discussing the VIZASTAR formula FUNCTIONS. It is the @IF function which uses LOGICAL operators to the best effect.

For example:

+@IF(C8=98.25,10,20)	'If cell C8 is EQUAL TO 98.25 then the result is 10, otherwise the result is 20'.
+@IF(B12<32,4,2)	'If cell B12 is LESS THAN 32 then the result is 4, otherwise the result is 2'.

VIZASTAR has the following LOGICAL operators:

=	Equal	4
<>	Not Equal	4
<	Less Than	4
<=	Less than or equal	4
>	Greater Than	4
>=	Greater than or equal	4
#OR#	Logical Or	5
#AND#	Logical And	5
#NOT#	Logical Not	5

These last three operators are used to 'join together' the other operators to make a compound logical 'test'. The numbers on the far right of the above table show the priority these operators have in formula evaluation.

For example:

+C15>100#AND#C15<200	'If cell C15 has a value greater than 100 and the cell C15 has a value less than 200'
+G2=50#0R#G3=10	'If cell G2 has a value equal to 50 or cell G3 has a value of 10'

Once again these examples would most likely be used in an @IF function to vary the result of the cell containing the formula.

For example:

+AI *@IF(+G2=50#0R#G3=10,0.45,0.60)

This example uses the same 'test' as in our last example to set a result of either 0.45 or 0.60 - this is then multiplied by the value in cell A1. This could be used as a way to vary the discount on a product price (held in A1) by either 45% or 60%.

11.7 FUNCTION KEY USE

To scroll the worksheet press F3 to move forward a screen, F4 to move backward a screen. Use the HOME key to move the cursor to the top of the screen column. Press HOME twice to go to the top of the sheet. The F 5 key is used to GO TO a particular cell address.

SECTION 5 - USING THE @FUNCTIONS IN FORMULAS

So far we have discussed how numbers and cell references are used in a formula. You have seen how to use both arithmetic and logical operators as a way of manipulating these values. VIZASTAR has a further set of 'manipulation aids' called FUNCTIONS.

FUNCTIONS are used to perform powerful operations that just can't reasonably be done using the arithmetic and logical operators alone. Functions usually require some numbers to work on and they then return a result. For example - you can supply a list of cell references, ranges or values to the @SUM function and it will add them all up. Do the same thing with the @AVG function and it will average all the values. Here are some examples:

+@SUM(2,4,6,8)	adds together 2+4+6+8 to make 20
+@SUM(A1,B1,C2:G2)	adds together cells A1 and B1 and all cells in the C2 to G2 range
+@AVG(6,3,9)	averages 6, 3 and 9 giving 6

Formula functions are used anywhere you would use a number. You can even 'nest' functions, which means using a function WITHIN another function.

The syntax rules for functions are pretty easy, every function name is preceded by the '@' symbol. Functions usually require something to 'work on', usually a list of values. These values can be numbers, cell references or cell ranges. Each must be separated by a comma, if you do 'nest' functions be very careful with your use of parentheses. Missing parentheses will usually generate a wrong result.

And finally an example of how you can combine many of the features we have discussed into a single formula:

```
+(25*(@IF(B1<66,@IF(G23=5,1,4),65*3-2)))-65
```

Remember that FUNCTIONS are shown in this manual, for readability, in upper case, but you must type them in LOWER case.

5.1 USING DATES IN FORMULAS

VIZASTAR has a set of formula functions to make using dates a very simple matter. Using these functions you can treat dates in formulas as if they were really numbers. So you can easily work out the number of days, months or years between given dates.

VIZASTAR, like LOTUS 1-2-3, uses the European format for dates - day, month, year. The 23rd day of October, 1984 is therefore written 23/10/84, but in North America this would be written 10/23/84. All date related functions will work correctly in VIZASTAR only if the European format is used.

For example:

+@DATE(21,2,84)	is used to refer to the 21st February 1984
+@TODAY	is used to refer to today's date

VIZASTAR holds a date internally as a whole number of days since 1st January 1900. If a cell holding such a number has its CELL FORMAT set to DATE, then the number is displayed in the worksheet as a date in the form DD-MMM-YY. Such as: 21-FEB-84

CALCULATING WITH DATES

Because VIZASTAR holds dates as numbers, you can calculate the difference between two dates by simply subtracting one from another in a formula.

For example:

'How many days from 5th to 21st of February 1984'?

+@DATE(21,2,84)-@DATE(5,2,84) gives a result of 16

You can use @DATE for many other calculations. For example, if a customer bought a product on the 22nd November 1984 and is allowed to pay in 30 days, the date when the money is due is:-

+@DATE(22,11,84)+30

If this formula is entered into a cell that has its CELL FORMAT set to DATE, 22DEC84 would be displayed.

Note that if the column width is made larger, the day of the week is also displayed.

For example:-

CELL WIDTH of 8 (default)	22NOV84
CELL WIDTH of 9	22-NOV-84
CELL WIDTH of 13	THU-22-NOV-84

Use the CELL WIDTH command and press CRSR LEFT and RIGHT to adjust the current column's width. Each column can be individually set.

Remember that the DATE FORMAT is rather unusual because although a number is held in the cell, it is a textual date that is displayed. Any references to the contents of this cell by formulas in other cells will always pick up the actual number. The actual number is only displayed if the CELL FORMAT is NOT set to DATE.

Date calculations are accurate and take into account the number of days in each month, including leap years. Errors in inputted dates are not reported but are corrected automatically. For example, +@DATE(34,10,84) i.e. 34th OCTOBER 1984 !! will display as 03-NOV-84 which correctly reflects 3 days beyond the last day (31st) of October.

5.2 THE @FUNCTION SYNTAX

The next section details the complete set of @FUNCTIONS that can be used in formulas. The following notation is used to describe the information that the various functions work on.

(x)	- A number, expression or cell location.
(x,x....)	- A list of numbers, expressions or cell ranges.
(day,month,year)	- Numbers, expressions or cell locations.
(date)	- A number, expression or cell location.
(range)	- A single cell or a cell range.
(offset)	- A number, expression or cell location.
(cell)	- A cell location
(digits)	- A number, expression or cell location

5.3 FORMULA FUNCTION REFERENCE (in alphabetical order)

@ABS(x)

The value of the function is the absolute value of (x), the sign is ignored.

Examples:

+@ABS(-99)	returns 99
+@ABS(23.79)	returns 23.79

@ATN(x)

The value of the function is the arc tangent of (x), the angle in radians whose tangent is (x). The function value returned is always between plus and minus @PI/2.

Examples:

+@ATN(-.3)	returns .29145674
+@ATN(D20)	returns the arc tangent of the value in cell D20.

@AVG(x,x....)

The value of the function is the average of all the values in the list. If a cell range is specified in the list, blank and text only cells are ignored.

Examples:

+@AVG(20,30,A1:B5)	averages 20, 30 and values in the A1:B5 range
+@AVG(20,40,10)	returns 23.33

@COS(x)

The value of the function is the cosine of (x), where (x) is an angle in radians.

Example:

+@COS(1.15)	returns 0.408487441

@COUNT(x,x....)

The value of the function is the number of CELLS in the list. If a range is specified in the list then only non-blank cells are counted.

Examples:

+@COUNT(B1:C2)	is 4 if all cells are used in the range.
+@COUNT(E1:F2)	is 2 if just 2 cells are used.

@DATE(day,month,year)

The value of this function is the total number of days between 1st January 1900 and the specified date. To display this number as a calendar date the cell must be in DATE format. Use CELL FORMAT DATE to set the format of a cell.

Example:

+@DATE(10,12,84)	displays as 10-DEC-84, but is 31024 internally.

@DAY(date)

The value returned by this function is the day portion of the date number supplied. The (date) is a date expressed as the number of days since 1st January 1900.

Examples:

+@DAY(31024)	returns 10
+@DAY(G23)	day number of date in cell G23

@ERR

The value returned by this function is @ERR. This causes the cell to be displayed in the worksheet as > ER. It's useful for highlighting an invalid entry.

Example:

+@IF(A4>99,@ERR,A4)	Flag as > ER if cell A4 exceeds 99

@EXP(x)

The value returned is the constant 'e' 2.71828183 raised to the power of (x). A value of (x) greater than 88.0296919 returns @ERR.

Example:

+@EXP(2.32)	returns 10.1756743
+@EXP(D20)	returns 'e' raised to the power of the value in cell D20.

@FALSE

The value returned by this function is zero.

Example:

+@IF(A4>99,@TRUE,@FALSE)	Sets a value of 1 (true) if A4 is greater than 99, otherwise it sets a value of 0 (false).

@HLOOKUP(range,x,offset)

This function is used to look up a table in the worksheet. @HLOOKUP searches the first ROW (i.e. horizontally) in the (range) for a number that is equal to or greater than (x). Once located the (offset) is used to pick up a result that is the (offset) number of ROWS farther away.

For example:

	A	B	C	D
14	1	2	3	4
15	15.25	3.2	1099	78.23
16	22.32	1.6	65	0

+@HLOOKUP(A14:D16,3,2)	searches along row 14 from A14 to D14 and locates the value 3 in cell C14. The cell C16 is 2 rows away and has a value of 65. This then becomes the value returned by the function.

@IF(expression,true-value,false-value)

The function evaluates the (expression). If the (expression) result is TRUE then the function returns (true-value) otherwise it returns (false-value).

Examples:

+@IF(2>3,45,89)	Returns 89 as 2 is not greater than 3
+@IF(2<3,45,89)	Returns 45 as 2 is less than 3

@INT(x)

The value returned is the integer part of (x).

Examples:

+@INT(25.65)	Returns 25
+@INT(-25.65)	Returns -25

@ISERR(cell)

The value returned is TRUE (1.0) if the (cell) is in ERRor, otherwise it is FALSE (0.0).

Example:

+@ISERR(D20)	Returns 1 if cell D20 is in ERR, returns 0 if cell D20 is not in ERR.

@ISNA(cell)

The value returned is TRUE (1.0) if the (cell) is set to NA; otherwise it's FALSE (0.0).

Example:

+@ISNA(D20)	Returns 1 if cell D20 is NA, returns 0 if cell D20 is not NA

@LOG(x)

The returned value is the natural logarithm base e of (x). If (x) is either zero or a negative number the returned value is set to ERR.

Examples:

+@LOG(3.25) Returns 1.178655
+@LOG(D20) Returns the natural logarithm base e of the value held in cell D20

@MAX(x,x....)

The returned value is the maximum of all the values in the supplied list. If all cells in the list are blank, a value of ERR is set.

For example:

	A		
14	123.67		
15	292.25	+@MAX(A14:A16)	Returns 292.25
16	122.32		

@MIN(x,x....)

The returned value is the minimum of all the values in the supplied list. If all cells in the supplied list are blank, a value of ERR is set.

For example:

	A		
14	123.67		
15	192.25	+@MIN(A14:A16)	Returns 122.32
16	122.32		

@MONTH(date)

This function returns the month number of the supplied date. The supplied (date) must be expressed in the form of the number of days since January 1st 1900.

Example:

+@MONTH(28012) Returns a month number of 9

@NA

The returned value is > NA, which simply means 'not available'. This can be used in an @IF function to warn the user of a certain situation or as a guide to other formulas which may base themselves on a cell containing the @NA

+@IF(D20<100,@NA,G34)

@PI

The returned value is 3.14159265359. @PI can be used to convert degrees to radians for use with the @COS, @SIN and @TAN functions. 1 degree is equivalent to @PI/180 radians.

@ROUND(x,number of digits)

The value returned is (x) rounded to the number of digits specified by the (number of digits) number. The (number of digits) number is treated as a whole (integer) number and must be in the range -14 to +14.

If (number of digits) is zero then (x) is rounded to an integer. If (number of digits) is positive then rounding is performed to the RIGHT of the (x) number's decimal point. If (number of digits) is negative then rounding is performed to the LEFT of the (x) number. If (number of digits) is 1 then rounding is to 'one place', i.e. rounded to the nearest tenth, if it is 2 then (x) is rounded to the nearest one hundredth and so on..

NOTE: When dealing with cash values in cells that are Formatted as integers a total often appears wrong. This is because internally each value has a fraction after the decimal point. If you @ROUND the total to two places with @ROUND(x,2) you will avoid this problem.

Examples:

+@ROUND(458.92,2)	returns 458.92
+@ROUND(458.92,-2)	returns 500.00
+@ROUND(458.92,0)	returns 459.00
+@ROUND(123.585,1)	returns 123.600
+@ROUND(D20,C0)	rounds the value in cell D20 by the number of digits value at cell C0

@SIN(x)

The value returned by this function is the SINE of (x), where (x) is an angle in radians.

Examples:

+@SIN(1.18)	returns .924606012
+@SIN(D20)	returns the SINE of the value in cell D20

@SQRT(x)

The value returned is the square root of (x). If (x) is negative then the value is ERR. If (x) is zero, the square root is zero.

Examples:

+@SQRT(1.18) returns 1.08627804
+@SQRT(D20) returns the square root of the value in cell D20

@SUM(x,x....)

The value returned is the sum total of all cells in the supplied list. Blank and text cells in a range are treated as zero.

For Example:

	A	B		
14	123.20			
15	100.10		+@SUM(A14:A16)	returns 345.62
16	122.32	70.20	+@SUM(6,A16:B16)	returns 198.52

@TAN(x)

The value returned by the function is the tangent of (x), where (x) is an angle in radians.

Examples:

+@TAN(1.14) returns 2.17587513
+@TAN(D20) returns the tangent of the value in cell D20.

@TODAY

This function returns the date that is entered in response to the SHEET GLOBAL DATE command. It is a value that is expressed as the number of days since 1st January 1900. This can be used along with the other DATE functions.

For example:

+@TODAY returns today's date as a number of days.

@TRUE

The value returned by this function is 1.0.

@VLOOKUP(range,x,offset)

This function is used to look up a table in the worksheet. @VLOOKUP searches down (i.e. vertically) the first COLUMN in the (range) for a number that is equal to or greater than (x). Once located the (offset) is used to pick up a result that is (offset) number of rightmost COLUMNS away.

For example:

	A	B	C
14	1	0.30	0.70
15	2	0.35	0.65
16	3	0.40	0.60

+@VLOOKUP(A14:C16,2,1) searches down column A from A14 to A16 and locates the value 2 in cell A15. The cell B15 is 1 column away and has a value of 0.35. This then becomes the value returned by the function.

+@VLOOKUP(A14:C16,3,1) returns 0.40
+@VLOOKUP(A14:C16,3,2) returns 0.60
+@VLOOKUP(A14:C16,1,1) returns 0.30

@YEAR(date)

This function returns the year number that is derived from (date), where the number (date) is expressed as the number of days since 1st January 1900.

Example:

+@YEAR(30645) returns 83
+@YEAR(D20) the year number of the date in cell D20.

SECTION 6 - THE CELL COMMAND

The commands available under the main CELL menu heading control the way in which VIZASTAR displays each cell. Some commands affect a single cell; others affect a range of cells. None of these commands actually change the contents of cells, just the way they are displayed.

6.1 FORMAT - SETTING THE CELL DISPLAY FORMAT

Purpose: To set the required display format for a single cell in the worksheet.

Command: CELL
FORMAT
GENERAL INTEGER CURRENCY DATE SCIENTIFIC

Sequence: Position the cell pointer on the required cell, press the CBM key followed by C F and then select the required format type. Press RETURN to have the cell displayed in the selected format.

Notes: If you wish to set the cell format for a range of cells - set the required format in just the first cell. Use the SHEET COPY command to copy the cell to the remainder in the range.

The effect of the different format types is purely to display the cell contents in an alternate way. If the cell entry is textual and a numeric format is set the text continues to display as text.

If you wish to set the default format for the entire worksheet use the SHEET GLOBAL FORMAT command.

If text is typed into a cell, the set format is ignored and the text is displayed normally. Text FORMATS are set in a different way by preceding the cell text by one of three format characters:-

"	Right Justify Text
!	Centre Text
&	Repeat To Fit Cell Width

GENERAL

Displays the number as an ordinary number as long as it fits in the column width, otherwise it is displayed as an exponential number.

INTEGER

Displays numbers as integers, the number is rounded up or down to be converted into a whole number for display.

CURRENCY

Displays numbers to two decimal places, the number is rounded up to two decimal places for display.

DATE

Displays the numeric cell content as a date in the form DDMMMYY (e.g. 28JAN84) See the @DATE formula function for more details.

SCIENTIFIC

Displays numbers in scientific notation, as a power of 10. For example 12,345 is 1.2345e4 and 342,000,000 is 3.42e8. The maximum number that can fit in the column width is displayed.

Cell Format Information

As a the cell pointer is moved over a cell the third line in the screen heading shows the cell's contents or formula. In the line above the set format type is displayed. Adjacent to this is shown a description of the cell, a Value, Text, Formula or blank if the cell is empty. If the cell is protected (CELL PROTECT ON or GLOBAL PROTECT ON) 'Protected' is also shown.

6.2 CALC - RECALCULATING THE WORKSHEET

Purpose: To turn automatic calculation of the sheet formulas on or off after entering a cell. Also to set the order of calculation to be by row-order or by column-order.

Command: CELL
CALC
AUTO MANUAL ROW COLUMN

Sequence: Press the CBM key followed by C C and then select the required option.

Notes: The effect of the selection applies to all cells in the sheet. These settings are retained with the sheet when saved to disk and are restored when the sheet is recalled from disk.

AUTO

Automatic calculation of all cell formulas are carried out after any alteration to the sheet or cell entry. In complex sheets this may make cell entry rather slow.

MANUAL

No automatic calculation takes place. Instead, re-calculation can be manually selected by pressing the F7 function key.

ROW

When re-calculating - cell formulas are taken row by row starting at row 0 and calculating for columns A - BL, then continuing with row 1 and so on. ROW is the default state when starting VIZASTAR.

COLUMN

When re-calculating - cell formulas are taken column by column starting at column A row 0 and then column A row 1 and so on to row 999. The next column is then re-calculated until all columns have been processed.

REMEMBER that the default calculation state is MANUAL. So if you have formulas and you change a number they won't change until you press F7 or set CELL CALC to AUTO.

These settings are RETAINED with the worksheet when it is FILE SAVE'd to disk. On recall (FILE LOAD) these settings are restored.

6.3 PROTECT - PROTECTING A CELL ENTRY

Purpose: To prevent or to allow a cell to be altered. Usually used to protect a cell from being accidentally changed or to assist in data entry by skipping over protected cells (when used with the SKIPTO UNPROTECTED command).

Command: CELL
PROTECT
PUT-ON, TAKE-OFF

Sequence: First position the cell pointer at the cell to be protected or unprotected, press the CBM key followed by C P and then select the required protection status.

Notes: Protecting a cell is rather like putting a fence around it. You will continue to see through the protection and have its content display but you will not be able to amend the cell entry until you subsequently unprotect it. Apart from preventing accidental alteration it can be used in conjunction with the SKIPTO sub command to force the cell pointer to skip over it to assist in data entry. In this case you would PROTECT ON descriptive cells and formula cells, leaving just the cells to be entered into as PROTECT TAKE-OFF.

6.4 WIDTH - ADJUSTING THE WIDTH OF A COLUMN

Purpose: To vary the displayed width of an entire column within the spreadsheet, usually when the adjacent column is already being used and the current column has lengthy textual material or a large number.

Command: CELL
WIDTH

Options: Use CRSR LEFT and CRSR RIGHT

Sequence: Press the CBM key followed by C W and then use the CRSR LEFT and CRSR RIGHT keys to adjust the column width. Notice that as the column width is adjusted the screen display instantly shows the effect.

Notes: Usually it is not necessary to adjust the column width to show long text. This is because VIZASTAR will 'borrow' space from adjacent EMPTY columns and continue to display text from the original column cell. However if you are using the adjacent columns the WIDTH command is the only way of 'revealing' lengthy text.

The minimum display width is 3 and the maximum is 75. However up to l20 characters can be entered into a cell and although not all will display on the screen it will all be correctly printed.

HOME resets the current column to 8 wide.

CLR resets the current column and all columns to the right of the cursor to 8 wide.

6.5 SKIPTO - AUTOMATIC CURSOR MOVEMENT

Purpose: To move the cursor onto the next cell which meets the specified status. Especially useful for a 'filling-in-the- blanks" type of data entry.

Command: CELL
SKIPTO
UNPROTECTED ADJACENT NOWHERE

Sequence: Press the CBM key followed by C S and then select U to always have the cursor move onto an UNPROTECTED cell. Select A to always have the cursor move onto the ADJACENT cell after typing into a cell and pressing RETURN. Select N to have the cursor skip to NOWHERE (which is the natural state). This cancels both types of automated cursor skipping.

Notes: When designing a sheet for general use it is often useful to automate some of the movements through the sheet. The SKIPTO command can be used in conjunction with CELL PROTECT to automatically skip from one UNPROTECTED cell to another quite automatically. Skipping horizontally to an ADJACENT cell is useful when entering large amounts of information into the sheet; it removes the need to press the CRSR RIGHT key after entering into a cell. You may select both UNPROTECED and ADJACENT to do completely automatic cell entry. In this case you will need to issue the command twice, i.e. CBM C S U and then CBM C S A.

6.6 DISPLAY - DISPLAY FORMULAS OR VALUES

Purpose: To change the sheet display so that cell formulas are displayed instead of their actual result. This removes the need to move the cursor over a cell to see the formula contained within that cell. Useful when setting up a sheet or when checking through.

Command: CELL
DISPLAY
VALUES FORMULAS

Sequence: Press the CBM key followed by C D and then select V to display the normal VALUES held in cells containing formulas. Select F to display the actual FORMULAS held in each cell.

Notes: When setting up a sheet you will often need to refer to formulas you have entered into other cells. You can always PRINT part of the sheet if you wish but you will probably find that this command will show you on-screen the information you require.

If you set CELL DISPLAY to FORMULAS and select one of the PRINT commands (PRINT ROW or PRINT RANGE each row's formulas are printed out line by line, rather like a program listing. Don't forget this - it's very useful!!

6.7 TONE - CHANGE THE SCREEN DISPLAY COLORS

Purpose: To change the color of the major parts of the screen. Due to hardware limitations it is not possible to change individual cell or column colors.

Command: CELL
TONE

Options: Use Function Keys F1 to F7

Sequence: Press the CBM key followed by C T and then use the function keys to cycle forward through the various color tones. Press SHIFT as well as the selected function key to cycle backwards through the color tones.

Notes: Use F1 to change the actual text color, and F3 to change the background color. F7 will reset the colors back to the normal.

Note that certain color combinations do not display very clearly and that if you select the same color for both background and text you will not be able to see what you are doing!! Use the F7 key in emergencies.

VIZASTAR remembers your color combination when saving your worksheet so that your color choice will be reinstated when you call the sheet back up again.

The default color combination has been selected as the most legible for users of the Commodore 1901 monitor. However color is a very personal choice and you may wish to alter it. To save time it is suggested that you create and save to disk a completely empty sheet with the colors suitably altered. This can be quickly recalled at the start of the session to automatically set your color choice.

SECTION 7 - THE SHEET COMMAND

The commands available under this heading generally have a wider implication than the CELL operations. Nearly all of them will actually change the sheet contents in some way, the remainder have a significant effect on the way that the sheet is presented on-screen. Be sure that you fully understand these commands before using them.

7.1 COPY - COPY CELL CONTENTS AND FORMULAS

Purpose: To copy a range of cell contents and formulas from one part of the sheet and to include them in another part. The sheet will then contain the same basic cell contents in both locations. Formulas containing cell references are adjusted to reflect their new relative position, unless the 'absolute' notation has been used.

Command: SHEET
COPY
Options: From Range: To:

Sequence: Press the CBM key followed by S C and then enter the range of cells to be copied and press RETURN. Now enter the cell range that is to contain the copied cells and press RETURN.

Notes: When entering a formula into a cell you may specify a 'relative' cell reference such as B23. Alternatively you can specify an 'absolute' cell reference such as $B23. When you do a SHEET COPY the notation of the cell references contained in formulas that are being copied govern whether VIZASTAR will automatically adjust them to be 'right' in their copied-to location.

For example if you had the following formula in cell C20:

+C22+C23+C24+50

and you COPIED this to cell H20 you will end up with:

+H22+H23+H24+50

in the copied-to location (H20).

However if your formula had been:

+$C22+$C23+$C24+50

and you copied this to cell H20 you would end up with an identical formula in the copied-to location.

You can see from these simple examples that the column was automatically adjusted to be 'relatively' the same after the copy. VIZASTAR will also adjust the row number to be relative as well unless you use the '$' prefix.

USING WORKSHEET RANGES IN THE COPY COMMAND

Since full worksheet ranges can be specified in both the FROM and TO prompts their 'shapes' can be quite different.

For example:

From Range: A0:D1 To: A10:C11

In this example, 8 cells are being copied into 6 cells. Here's how the copy will work:

A0 is copied to A10
B0 is copied to B10
C0 is copied to C10
D0 is copied to A11
A1 is copied to B11
B1 is copied to C11
C1 is not copied
D1 is not copied

As you can see, the COPY command works one cell at a time, row by row. This can be put to good use when re-arranging the worksheet. You can copy a row of numbers into a column and vice-versa. To copy Row 1 from cell AI through to J I and place it in column A, starting at row 1 supplying the following ranges:-

From Range: A1:J1 To: A1:A10

Using the same technique you can also copy a column into a row, note that this technique works fine for copying just one row or column. If you have several rows or columns to swap about, you should do one at a time.

The COPY command can also be used to repeatedly copy a single cell into many others. For example to fill cells A1:D14 with zeros, enter a zero in cell A1, then SHEET COPY with the following ranges:-

From Range: A1 To: A1:D14

Cells A1 through to D14 will then contain zero.

7.2 MOVE - MOVE CELL CONTENTS AND FORMULAS

Purpose: To copy a range of cell contents and formulas from one part of the worksheet and include them in another part. The original cell contents are erased from the sheet. The worksheet then contains just one copy of the original cells but in the new location. Formulas containing cell references within the moved row or column are adjusted to be right for their new position.

Command: SHEET
MOVE

Options: From Range: To:

Sequence: Press the CBM key followed by S M and enter the range of cells to be moved and press RETURN. Now enter the range that is to contain the moved cells and press RETURN.

Take care when specifying the TO: range. Like the COPY command the area of the worksheet that will hold the moved cells will be destroyed in this process (unless they have been CELL PROTECT'ed or SHEET GLOBAL PROTECT'ed).

Be similarly careful not to OVERLAP the 'From' and 'To' range.

7.3 INSERT - INSERT A COLUMN OR ROW INTO THE SHEET

Purpose: To insert an empty column or row into the sheet before the cell pointer. All formulas containing cell references to locations affected by the insertion are automatically adjusted. This includes absolute cell references.

Command: SHEET
INSERT
ROW COLUMN

Sequence: Press the CBM key followed by S I and then press R to insert a ROW, alternatively press C to insert a column. A ROW is inserted above the cell pointer; a COLUMN is inserted to the left of the cell pointer.

Notes: Cell references in formulas are automatically adjusted to reflect the changed position of rows or columns that they may refer to. 'Absolute' cell references such as $B23 are also changed by this process.

7.4 DELETE - DELETE A COLUMN OR ROW FROM THE SHEET

Purpose: To delete a single column or row from the sheet. All formulas containing cell references to locations affected by the deletion are automatically adjusted. This includes absolute cell references.

Command: SHEET
DELETE
ROW COLUMN

Sequence: Press the CBM key followed by S D and then press R to delete the current ROW, alternatively press C to delete the current column.

Notes: Cell references in formulas are automatically adjusted to reflect the changed position of rows and columns that they may refer to. 'Absolute' cell references such as $B23 are also changed by this process.

7.5 TITLE - FREEZE WORKSHEET HEADINGS

Purpose: To 'freeze' headings in a sheet containing related information that is either 'long' (many rows, few columns) or 'wide' (many columns, few rows). Similar to a 'window' but without the usual border.

Command: SHEET
TITLE

Sequence: Move the cursor immediately outside the area to be 'frozen', press the CBM key followed by ST.

Notes: Normally you will want to freeze a row at the top of the screen or a column on the left of the screen. When freezing a row ensure that the cell pointer is positioned to the very left of the sheet display and immediately beneath the row or rows to be frozen. When freezing a column ensure that the cell pointer is positioned at the very top of the sheet display and immediately outside the column or columns to be frozen. If you wish to freeze a complete row/column border then position the cell pointer at the top left hand corner of the area to be 'cut-out'.

You may TITLE within any WINDOW, however this will reduce the number of available windows down to a minimum of four. This is because VIZASTAR considers a TITLE to be simply a border less window. Note that a window containing a TITLE has a suffix of 'T' in the top left corner.

To remove a TITLE from within a window, use the SHEET WINDOW CLOSE command.

7.6 WINDOW - SPLITTING THE SCREEN DISPLAY

Purpose: To provide up to 9 different views of the current worksheet through 'windows' of any size or shape. By using the GO TO function key (F5) and replying with the window number the cell pointer can be moved between window to alter the display or enter into the sheet in the usual way.

Command: SHEET
WINDOW
OPEN-WINDOW CLOSE-WINDOW

Sequence: Move the cursor to the top left corner of the window to be opened, press the CBM key followed by S W and O to open up a window or C to close the current window.

Notes: VIZASTAR uses the position of the cell pointer as the top left hand corner of the window to be opened. This 'cuts-out' a rectangle from that position to the bottom right hand corner of the screen display. Any windows that have been opened underneath this area will be covered up or overlapped until the covering window is CLOSED. Quite simply each new window you open has a greater priority over earlier ones.

When you CLOSE a window all later windows are renumbered and the cell pointer is placed inside the next open window. Any windows that were covered or overlapped by the closed window will now show through. To move the cell pointer from window to window use the F5 GO TO key and reply with the number of the required window and press RETURN.

7.7 GLOBAL - SET ASSUMED CELL FORMAT/PROTECTION

Purpose: To set the assumed cell format for all cells within the sheet that have NOT BEEN SPECIFICALLY given a CELL FORMAT by the CBM C F command. To set the assumed protection status for all cells that have NOT BEEN SPECIFICALLY given a CELL -PROTECTION by the CBM C P command. Also to set TODA Y's date.

Command: SHEET
GLOBAL
FORMAT PROTECT DATE(dd/mm/yy)
GENERAL INTEGER CURRENCY DATE SCI
PUT-ON TAKE-OFF

Sequence: Press the CBM key followed by S G F and select the required global cell format.
Press the CBM key followed by S G P and select the required global protection status.
Press the CBM key followed by S G D and enter
TODAY's date in dd/mm/yy format.

Notes: All cells which have not been given a specific CELL FORMAT will be displayed in the newly selected format. To set a cell to have a PERMANENT cell format – the CELL FORMAT command should be used. The effect of the different format types is purely to display the cell contents in an alternate way. If the cell entry is textual and a numeric format is set the text continues to display as text.

GENERAL

Displays the number as an ordinary number as long as it fits in the column width, otherwise it is displayed as an exponential number.

INTEGER

Displays numbers as integers, the number is rounded up or down to be converted into a whole number for display.

CURRENCY

Displays numbers to two decimal places, the number is rounded up to two decimal places for display.

DATE

Displays the numeric cell content as a date in the form DDMMMYY (e.g. 28JAN84) See the @DATE formula function for more details.

SCIENTIFIC (SCI)

Displays numbers in scientific notation, as a power of 10. For example 12,345 is 1.2345e4 and 342,000,000 is 3.42e8. The maximum number that can fit in the column width is displayed.

GLOBAL PROTECTION

Set Global Protection ON to ensure that you (or someone else) cannot accidentally lose parts of the sheet containing complex formulas or EXEC Lists. Then CELL PROTECT TAKE-OFF just the cells that you wish to change.

GLOBAL DATE

Type today's date in dd/mm/yy European number format. This date can then be referenced in cell formulas using the @TODAY function.

Enter:22/10/84 sets to days date as the 22nd October 1984

+@TODAY then has the value of 30975

Set the CELL FORMAT (of the cell with the '+@TODAY' formula) to DATE. The cell then displays as: 22OCT84.

Also see the FORMULA FUNCTIONS section.

7.8 SORT - ORDERING THE SHEET CONTENTS

Purpose: To organize entire rows in the sheet alphabetically and numerically in either ascending or descending order.

Command: SHEET
SORT
ASCENDING DESCENDING
Options: From Range: By Column:

Sequence: Press the CBM key followed by S S and select either ASCENDING or DESCENDING order. Enter the row range to be sorted and then select the column that the rows will be sorted by. The top screen line changes color during the sorting process.

Notes: Rows included in the range to be sorted may be either numbers or texts, or both. Sorting is performed in true ASCII order (see Appendix for full ASCII code list) which is basically numbers followed by upper case letters followed by lower case letters.

Small database files can also be sorted by getting records from the file (USEing CRITERIA if required), transferring them into worksheet rows using DATA TRANSFER TO-SHEET and then SORTing the rows.

For example if rows 10 through 20 contained file records and you wanted them to be sorted by ascending order of last names (which was field B), issue SHEET SORT ASCENDING with a range of A10:A20 and say 'By Column:B'.

7.9 ERASE - REMOVING CELL CONTENTS FROM THE SHEET

Purpose: To completely remove the contents of one or more cells from the sheet, leaving the cell empty.

Command: SHEET
ERASE
Options: From Range:

Sequence: Press the CBM key followed by S E and enter the range to be erased, enter ALL to erase the entire sheet.

Notes: Note that ERASE removes the cell format setting as setting as well as the cell contents. Be careful when using this command, if in doubt - FILE SAVE the worksheet to disk first.

7.10 XEC SETTING THE START OF AN EXEC LIST

Purpose: To set the start column and row number of an EXEC list. The EXEC list is then automatically processed when the F8 function key is pressed.

Command: SHEET
XEC
Options: From Range:

Sequence: Press the CBM key followed by S X and enter the start COLUMN and ROW containing the EXEC list.

Notes: By default an EXEC starts from cell A0, working down through column A until a blank or non-text cell is met. The full EXEC facility is detailed in a separate section of this manual. Quite simply, the sheet contents are entered into the keyboard as if typed by hand. Additional EXEC commands can be used to control the processing of the EXEC list.

The F6 key will always abort an EXEC list and return control to the keyboard.

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SECTION 8 - THE FILE COMMAND

VIZASTAR has a set of filing commands that enable you to store and recall your worksheets from disk. This is necessary because the computer 'loses' all knowledge of your work when it is turned off. You can store as many worksheets on a disk as will fit and use as many different disks as your budget allows!!

CHANGING DISKS

If you change disks during a VIZASTAR session, don't forget that you may have been referring to a VIZASTAR database on the removed disk **DO NOT - DATA ACCESS - THE NEW DISK** by mistake. You must first DATA USE a database on the NEW DISK before using the DATA command. If you fail to do this your new disk could contain damaged files as VIZASTAR will still think you have your old database disk in the drive.

If you were just using worksheet files then no special action need be taken.

NAMING THE WORKSHEET

Worksheets are stored on disk as special VIZASTAR sequential files, when you store your worksheet you give it a unique name. It is this name that identifies one worksheet from another, enabling you to recall a particular worksheet from a disk containing many others. Avoid using a slash (/) in the file name, this is reserved for use by the EXEC facility.

LISTING A DISK'S CONTENTS

If you are unsure as to what files are contained on a particular disk you may display a list of files (known as the disk's 'directory'), to help you identify one 'kind' of file from another VIZASTAR automatically tags a file type suffix to all files, databases and database layouts. These are listed below.

Normally you do not need to specify these suffixes as VIZASTAR automatically handles this for you. VIZAWRITE 64 word processing documents do not have suffixes but can still be identified as they are stored as PRG (program) files. VIZAWRITE CLASSIC documents and ALL VIZAST AR files appear in the disk directory as SEQuential files.

VIZASTAR FILE SUFFIXES

.WKS	Worksheet
.DAT	Database
.LAY	Layout for a database file
.PRT	A Worksheet printed to disk

For example:-

		NAME	SUFFIX	TYPE
A Worksheet	-	"budgets	.WKS"	SEQ
A Database	-	"business	.DAT"	SEQ
A File Layout	-	"customers	.LAY"	SEQ
A Document	-	"letter"		PRG

Database files do not appear in the disk's directory, they appear in the database directory (DATA OTHER DIRECTORY).

8.1 SAVE - SAVING THE SHEET TO DISK

Purpose: To save the entire worksheet to disk under a specified name.

Command: FILE
SAVE
Options: Name:

Sequence: Press the CBM key followed by F S and then type a new name or re-use the existing name. Press RETURN to SAVE the entire worksheet to disk.

Notes: If a worksheet already exists on the disk you are using, the disk message 'FILE EXISTS' will be shown. You may now choose to REPLACE the file on disk with the worksheet in memory. Type a 'y' AND PRESS RETURN to replace the file or type an 'n' AND PRESS RETURN to abandon the SAVE command.

In addition to SAVING the worksheet VIZASTAR also saves various system 'parameters' which are restored whenever the worksheet is subsequently LOADED. These are as follows:-

Current Cell Pointer Position
Full Worksheet File Name
Active Window Positions
Active Graphing
Automatic Recalculation Setting
Order of Recalculation Setting
SKIPTO Setting
Display Values or Formulas
Global Format
Color Settings
Exec Column/Row
All Printer Menu Options
Last Commands Used

8.2 LOAD - LOADING A SHEET FROM DISK

Purpose: Loads (recalls) a worksheet from disk into the computer memory. This effectively REPLACES the existing worksheet held in memory making it the current worksheet.

Command: FILE
LOAD
Options: Name:

Sequence: Press the CBM key followed by F L and then type the name of the worksheet held on disk. Press RETURN to LOAD in the worksheet from disk.

Notes: REMEMBER IF YOUR CURRENT WORKSHEET CONTAINS VALUABLE INFORMATION BE SURE TO SAVE IT FIRST.

Along with the worksheet contents VIZASTAR will also restore various system 'parameters' that were in use when the worksheet was SAVED. See the SAVE command notes for a full list of these. This effectively means that you can leave and then resume work on a sheet in exactly the same place and surroundings.

DON'T FORGET THAT WORKSHEETS CAN BE LOADED FROM A 'FILE $LIST'.

8.3 MERGE MERGING FILES INTO THE SHEET FROM DISK

Purpose: To bring in part of another worksheet, word processing document, sequential file or disk file list (directory) into the current worksheet at the current cell pointer location. Additionally to ADD or SUBTRACT part of the current worksheet with a part of a worksheet held on disk.

Command: FILE
MERGE
WORKSHEET LIST DOCUMENT SEQUENTIAL

Sequence: Press the CBM key followed by F M and then select the required type of merge operation. Certain options then require further replies which are individually explained below:-

Command: FILE
MERGE
WORKSHEET
COMBINE ADD SUBTRACT
Options: Name: From Range: To Range:

Notes: You may ADD or SUB TRACT a range of cells from a worksheet held on disk to cells starting at the current cell-pointer position. The COMBINE command actually REPLACES the 'To Range' cells in the current worksheet with those brought in from the worksheet on disk (the 'From Range').

The 'From Range' controls the range of cells that are brought in from the worksheet on disk. These cells are placed in the 'To Range' cells. This operates in a similar way to the SHEET COPY command and allows any 'shaped' range of cells to be pulled off disk and COMBINED, ADDED or SUBTRACTED within any 'shaped' range of the current worksheet in memory.

Command: FILE
MERGE
WORKSHEET
LIST (disk directory)

Notes: This command brings into the worksheet a complete list of all files held on the current disk in use. This LIST can then be printed, annotated, sorted, saved etc. Be sure to position the cell pointer to the starting cell in the column that is to receive the list.

Command: FILE
MERGE
DOCUMENT (word processing files)
Option: Name:

Notes: This command brings into the worksheet text and numbers from a word processing file (for SUPERSCRIPT refer to the SEQUENTIAL option). Word processing files created by VIZAWRITE, PAPERCLIP and WORDPRO can be brought into rows within the current column. VIZAWRITE text is automatically justified to be within the current VIZASTAR PRINTER MARGIN settings. They can then be MOVED, COPIED or PRINTED. VIZAWRITE documents will be merged from the beginning of Page 1 to the end of Page 1, ignoring the Work Page and any Format Lines and Format Symbols.

Be sure to position the cell pointer to the starting cell in the column that is to receive the DOCUMENT.

Command: FILE
MERGE
SEQUENTIAL (CBM ASCII files)

Option: Name:

Notes: This command option will bring into the worksheet text and numbers from a STANDARD CBM ASCII SEQuential file. Sequential files can be created directly from BASIC programs and are also used by some software programs such as SUPERSCRIPT.

Although VIZASTAR creates worksheets, layouts etc. as SEQuential files these are held in a compressed form and may not be brought into the worksheet using this command option.

Be sure to position the cell pointer to the starting cell in the column that is to receive the SEQUENTIAL FILE.

8.4 $LIST - DISPLAY DISK DIRECTORY

Purpose: To display a list of all files on the current disk.

Command: FILE
$LIST

Sequence: Press the CBM key followed by F $.

Notes: This is only a display of files; it does not destroy any data in your worksheet. If there are more entries in the directory than will fit on the screen 'More...' will appear at the base of the screen. Press the SPACE BAR to see the next screen.

Use the CRSR UP and CRSR DOWN keys to point to a worksheet file (.WKS) to be loaded in, then PRESS RETURN. If the worksheet you are currently working on has not been saved since it was last altered the prompt 'Are You Sure' is displayed - press 'y' to load in the new worksheet, press 'n' to abandon the FILE $LIST leaving your existing worksheet intact.

8.5 TIDY - DISK MAINTENANCE

Purpose: To format (new/header) a fresh disk or tidy up an existing disk.

Command: FILE
TIDY
ERASE FORMAT SPECIAL

Sequence: Press the CBM key followed by F T and then select the required operation. Certain operations then require further replies which are each individually discussed below:

Command: FILE
TIDY
ERASE
Option: ==>

Notes: Just type the name of the worksheet to be ERASED and press RETURN. This command ERASEs the named worksheet file from the current disk. If the named worksheet is then successfully ERASED (scratched) from the disk the disk drive responds with the message '00,FILES SCRATCHED,01,00' . The message '00,FILES SCRATCHED,00,00' is shown if the named worksheet was not located. The number after the word SCRATCHED shows how many files have been removed. These messages are generated by the Commodore Disk Operating System (DOS) and are detailed in the manual supplied with your disk unit.

Command: FILE
TIDY
FORMAT
Options: ==>

This command is used to COMPLETELY BLANK the contents of a disk and format it for use. It is directly equivalent to the 'NEW' command described in the CBM disk user's manual. Type in the name you wish to give to the disk (up to 16 characters) then type a comma followed by any two characters. Press RETURN to FORMAT the current disk.

Note that ALL INFORMATION HELD ON THE DISK WILL BE IRRETRIEVABLY LOST - so be extremely careful when using this command. It MUST be used on a brand new disk before you attempt to store worksheets, databases etc.

Command: FILE
TIDY
SPECIAL
Option: ==>

This command gives you direct access to the 'command channel' of the disk drive, so that you may send your own disk operating system commands. These are detailed in the disk user's manual and includes copying, renaming, scratching and disk validation. Normally you will not need to issue these from within VIZASTAR, this command is provided for experienced users, just in case they have the need!!

For example:

==>v	-	Validates The Current Disk
==>s:sheet*	-	Erases all files starting with 'sheet'
==>c:new=old	-	Copies the file 'old' and calls it 'new'

Additionally this command can be used to select a disk unit with a device number of 8 or 9 and select a disk drive number 0 or 1. Type 8,9,0 or 1 and press RETURN. VIZASTAR will then perform all future disk operations to the device and drive number as set.

For example:

==>9	-	Select disk unit with device number 9.
==>1	-	Select disk drive 1 on the current disk unit.

WARNING: You should NEVER COPY A DATABASE using the command channel, the fresh copy made of the database will most likely destroy your original (if you USE the newly copied database) see the INFORMATION MAINTENANCE section on backing-up the database. Also NEVER COPY A WORKSHEET, instead call up the original and SAVE it back to disk under a different name, you will then have two identical worksheets on disk under two different names.

Validating a diskette containing worksheets and databases is quite O.K. as VIZASTAR conforms to standard disk operations. You may also SCRATCH whole databases with this command. For example to erase the 'dbase' database issue FILE TIDY SPECIAL and type 's0:dbase*' and press RETURN. All the files in the VIZASTAR database called 'dbase' are then erased.

Be careful - you cannot get them back!!

Note that the .LAY files containing your database file layouts are NOT erased by this command.

SECTION 9 - THE PRINT COMMAND

Using the PRINT command you are able to obtain a printed copy of part of your worksheet. You need only specify the range of cells to be printed and VIZASTAR will extract and print just your selection.

9.1 PRINTING FROM THE WORKSHEET

VIZASTAR keeps track of where you are on the printed page so that you can build up lists, reports, statements, invoices etc. from different parts of the current worksheet or even from many different worksheets. VIZASTAR's minimum output is a line (whereas a word processor usually deals in whole pages) so that you can issue PRINT commands time and time again, printing one or many lines while VIZASTAR takes care of page numbering, headers/footers and advancing the paper at the end of each sheet.

VIZASTAR has a whole host of printing features, but you only use them when you need to. VIZASTAR has been pre-set to assume (default) most options anyway. If you do change the pre-set options these are automatically SAVED with the current worksheet so that you do not need to change these options each time you LOAD (recall) the worksheet in future VIZASTAR sessions.

When you want to print out from a database file you will first need to DATA TRANSFER each record into the same row in the sheet and then PRINT ROW, you repeat this for each record to be printed. If you have more than just a few records to print then this can be automated using a VIZASTAR EXEC.

Don't forget that the DATA OTHER REPORT command does this for you, automatically printing every record in the database file (USE'ing CRITERIA if set).

You can of course take a printed copy of a screen display by holding down the ALT key and pressing 3.

If you have an Epson compatible printer, such as a STAR, you can also get a high-resolution screen dump. Press one of the following numbers ON THE NUMERIC KEYPAD while holding down the ALT key.

ALT + 1 High-resolution screen dump to Epson compatible printers

ALT + 2 High-resolution screen dump to Epson FX-80/85

ALT + 3 Regular copy of screen contents to any printer

REMEMBER TO USE THE NUMERIC KEYPAD.

9.2 THE PRINT COMMAND

Purpose: To obtain a printed copy of part of the worksheet. If CELL DISPLAY FORMULAS is active then just the cell formulas within the range are listed.

Command: PRINT
ROW OPTIONS PAGE LINE TOP
Options: Menu

Sequence: Press the CBM key followed by P and then select the required print operation. When using the OPTIONS command a 'drop-down' menu is displayed. To alter the menu just type over the existing setting. Use the CRSR UP and CRSR DOWN keys to move up and down the menu. Press Fl on this menu to commence printing or press STOP to abandon it.

Notes: The following sections deal with each PRINT command type.

9.3 PRINT ROW

This command prints a single row starting at the current cell pointer column until the printers RIGHT MARGIN has been reached. Effectively prints a single line. If you wish to print out starting from column A - don't forget to first move the cell pointer to column A before confirming the command.

9.4 PRINT PAGE

The PAGE command advances {ejects} the paper to the top of the next page. If you have specified a FOOTER CELL then this will be printed at the foot of the current page before positioning to the top of the next page. The built-in page number is also advanced by one.

9.5 PRINT LINE

The LINE command advances the paper by one line; if this takes the position past the number of LINES IN THE PAGE then VIZASTAR will automatically print the FOOTER and advance the built-in page number by one. You should use this command to space lines rather than adjusting the printer manually.

9.6 PRINT TOP

This command tells VIZASTAR that you have re-positioned the paper to be at the top of a page. You do not need to use this command unless you adjust the paper position manually, in which case YOU MUST TELL VIZASTAR!! Otherwise your subsequent printed copy will spill over paper perforations or directly onto the printer roller. The built-in page number is reset back to page one.

9.7 PRINT OPTIONS

All printing format options are contained within this 'drop-down' menu. When a VIZASTAR session begins these options are pre-set to assume certain values. Once changed they will remain in-force for the remainder of the VIZASTAR session. Any worksheets that are SAVED during the session will 'take-on' any changed options. This removes the need to keep altering the options when worksheets are recalled in future sessions.

The pre-set assumption is that you have a Commodore printer connected such as the 1525, MPS-801 or MPS-803. The assumed paper size is 11" by 9" which is standard continuous computer paper. This is also within the size of A4 single sheet paper.

The Print Option Menu Showing Assumed Values:

```
==========================
Printer Type      :    c
Single Sheet      :    n
Line Feed         :    y
Paper Length      :    66
Header Cell       :    AH0
Top Margin        :    2
Left Margin       :    5
Right Margin      :    75
Lines In Page     :    55
Footer Cell       :    AF0
Setup Cell        :    AS0
Start Cell        :    A0
End Cell          :    BL0
==========================
```

PRINTER TYPE

VIZASTAR can print out to both Commodore Printers and directly to 'Parallel' and RS-232 printers (i.e. VIRTUALLY ALL OTHER AVAILABLE PRINTERS) via the USER PORT and a special connecting cable (available from many suppliers and VIZA SOFTWARE).

The printer type value must be set to tell VIZASTAR which type of printer connection is being used.

Commodore Printers	-	Use a 'c'
RS-232 Serial Printers	-	Use a 'r'
Parallel Printers	-	Use a 'p'

If you have a parallel printer connected to the Commodore serial socket via an interface (CARDCO, TRIPLER, VIC-SPRINT etc.) then set a printer type of 'a'. VIZASTAR will then send out true ASCII characters via the Commodore serial socket.

If you wish to send information through SECONDARY addresses to your printer or printer interface, this can be done using the SETUP CELL option. This is discussed later.

FURTHER INFORMATION REGARDING PRINTER INTERFACING CAN BE FOUND IN THE 'READ ME' WORKSHEET ON THE SYSTEM DISK.

SINGLE SHEET

If you are using continuous stationery then you should enter an 'n' for NOT SINGLE SHEET. If you are using letter headings or plain sheets fed by hand then enter a 'y' for YES SINGLE SHEET. At the start of the print run and at the top of each fresh page VIZASTAR will halt and you will be prompted to change the stationery.

LINE FEED

Many printers have a feature known as 'automatic line feed'. This is often selectable by 'DIP' switches (tiny switches fitted to the printer's circuit board) that are usually buried inside the printer. The effect of a printer that 'automatically line feeds' is that the paper is automatically advanced by a line whenever the printer is told to return its carriage (print head). Hence the term 'carriage return' that is so widely used.

What VIZASTAR must know is whether your printer is set to do this or not. Enter a 'y' if your printer LINE FEEDS after a carriage return. Enter an 'n' if your printer does NOT LINE FEED after a carriage return. The easiest way to find this out is to print out a few lines from VIZASTAR. If the lines are printed on top of each other then you should enter an 'n' (NO IT DOESN'T) and if you have a lot of space between each line then enter a 'y' (YES IT DOES).

PAPER LENGTH

Enter the number of lines that can fit on a single page (or single label) of the stationery you are using. Don't forget that many printers can be made to vary the number of lines that they print in each inch of paper. This is usually pre-set at 6 lines per inch. So that on standard 11" paper you could potentially print a total of 66 lines. In practice you leave gaps at the top and bottom but VIZASTAR needs to know how many lines THAT COULD BE PRINTED ON. If when you come to print you find that your reports 'slip down' each page then it is quite likely that this option is incorrectly set

HEADER CELL

If you are familiar with a word processing system you will already know what a 'header' is all about. This menu option tells VIZASTAR at which cell location it will find a line of text to be printed at the top of every fresh page. If the cell location is empty or contains a number then VIZASTAR will just leave each page heading blank. If you want to RIGHT JUSTIFY or CENTRE your heading then use the TEXT PREFIX characters " and ! described in the CELL FORMAT command. If you want the current page number to be automatically substituted and printed - then type a hash symbol (SHIFT -3).

TOP MARGIN

After printing any page 'header', VIZASTAR advances the paper by this TOP MARGIN value. It is pre-set to leave a two line gap in between any header and the first line of worksheet information. Adjust it to suit your required page layout.

LEFT MARGIN

The LEFT MARGIN is the area to the left of the page that is to be left blank. HEADERS and FOOTERS do not use the margin settings but print 'as is'.

RIGHT MARGIN

The RIGHT MARGIN is the rightmost print position that you will allow VIZASTAR to print up to. HEADERS and FOOTERS will print past this position if they contain sufficient text. This is intentional and can provide an attractive report layout.

LINES IN PAGE

This menu option controls how many worksheet ROWS or LINE advances can be printed on each page. It is absolutely vital that this is set correctly and that the combination of this and the TOP MARGIN setting does not exceed the actual PAPER LENGTH. If it is set incorrectly your pages will 'slip down' on each successively printed page.

FOOTER CELL

Again if you are familiar with a word processing system you will already know what a 'footer' is all about. This menu option tells VIZASTAR at which cell location it will find a line of text to be printed at the foot of every printed page. If the cell location is empty or contains a number then VIZASTAR will just leave each page footing blank. If you want to RIGHT JUSTIFY or CENTRE your footing then use the TEXT PREFIX characters " and ! described in the CELL FORMAT command. If you want the current page number to be automatically substituted and printed - then type a hash symbol (SHIFT -3).

One blank line is automatically left between the last worksheet ROW or LINE advance and the footer line.

SETUP CELL

This menu option is for those who have mastered the various strange codes that your printer recognizes to print different character sizes, line spacing etc. The cell location that you enter into this menu option should be blank or contain a single leading single quote (a SHIFTED 7) followed by a sequence of decimal numbers that are to be sent to the printer whenever the PRINT command is used.

For Example:

AS0:'27 69	Sends a 27 (ESC) and a 69 (ASCII E)

This will set an EPSON, STAR or SHINWA printer to print all subsequent characters in EMPHASIZED mode. You can also send out several codes at the same time if you wish.

For Example:

AS0:'27 69 27 118	Sets both EMPHASIZED and 1/8" line spacing.

If your printer is not EPSON compatible then you still use the same principle but you would most likely need to send different codes to perform the same or similar functions.

If you need to send codes via a SECONDARY address then precede the code by the letter of the alphabet corresponding to the secondary address number. The letter 'a' is 1 'b' is 2 and so on.

For example:

AS0:'e 25 z 44	Sends 25 via secondary address 5 and then 44 via secondary address 26.

START CELL

This is the starting cell location of the range to be printed, the top left hand corner of the rectangle to be printed. It is pre-set to cell A0.

END CELL

This is the last cell location within the range to be printed, the bottom right hand corner of the rectangle to be printed. It is preset to D14.

THE PRINT RUN

Once you have adjusted the menu options to suit – commence printing by pressing the F1 function key. You may press the STOP key at any time to interrupt or abandon the printing.

Alternatively, press the F2 function key to print the worksheet to the disk. The file name has a suffix of '.PRT'.

This file can then be printed using a program such as SIDEWAYS. This is particularly useful for printing wide worksheets.

SECTION 10 - THE DATA COMMAND

The DATA command opens up the world of information control using VIZASTAR's unique integrated database management system (DBMS). In the opening sections we explained the fundamentals behind database systems on personal computers. Using the DATA command you are able to design, use, access and transfer your own database records. And remember that because the VIZASTAR worksheet sits right alongside you have all the processing power of cell formulas ready to hand.

10.1 USE - NAME A DATABASE, FILE OR PART-FILE

Purpose: To instruct VIZASTAR that you wish to create or USE a different database or a different file within the same database. Additionally to set a criteria range in the worksheet that limits ACCESS to just part of the database file meeting the criteria. If either the database or file is not located on the current disk VIZASTAR assumes that it is being instructed to set up a NEW database or a NEW file within the currently known database.

Command: DATA
USE
DATABASE FILE CRITERIA

Options: Name: Range:

Sequence: Press the CBM key followed by D U and then select the required option. When USE'ing a database or a file you should enter the database or file name and press RETURN. If you are USE'ing CRITERIA specify the cell range of the CRITERIA and press RETURN.

Notes: The commands are now discussed:-

DATABASE

A database name can be up to 10 characters long (A-Z, 0-9, avoid '/') and must be unique to the other databases you may have on the current disk. If the database name you give is not located on the current disk you are asked 'Not Known - Shall I Create It?' press 'y' to create a new database under this name, press any other key to abandon the DATA USE command.

When a new database is created by VIZASTAR it simply puts an entry in your disk directory (FILE $LIST) with a suffix of '.DAT' (see explanation of suffixes under the FILE command). It will always appear that only 1 disk block (254 characters) has been used, but VIZASTAR knows better!!

FILE

A database file name can be up to l0 characters long (A-Z, 0-9, avoid '/') and should normally be unique to ITS OWN AND ALL OTHER DATABASES you have on the current disk. If the database file name you give is not known WITHIN THE CURRENTLY KNOWN DATABASE then you are asked: 'Not Known - Shall I Create It?'. Press 'y' to create a new database file under this name, press any other key to abandon the DATA USE command.

When a new database file is created by VIZASTAR you will be presented with a blank screen layout (equivalent to DATA SETUP). You can design your file record layout as detailed under the DATA SETUP command. You will 'stick' within this series of SETUP commands until you QUIT (CBM Q) the setup. At this time VIZASTAR will actually place an entry in its database so that it knows about the new file you have created.

If you wish to change your file record layout at a later date then you must first 'DATA USE FILE filename' and then 'DATA SETUP', which is explained later. If a new file name is given which is the same as a file name in another database on the same disk, the file layout for the other file will be brought in for the new file.

CRITERIA

If you set up CRITERIA you are able to limit ACCESS to just those records that match the criteria. So if you wanted to look at all the 'Smith's' in a database file you would first issue this command, and then ACCESS NEXT to have VIZASTAR locate the next 'Smith' in the file. In this way CRITERIA is really limiting your ACCESS to a smaller but specific part of the FILE that is in USE. Because VIZASTAR needs to examine each record on the file in detail - using CRITERIA on large files will be slow if only a few records ever meet that criterion.

Specifying CRITERIA is easy, it is done first in one or more worksheet rows. Remember that when you setup the file record layout you had to give each field a letter from A through to BL; well you just place your matching criteria for each of the lettered fields in the corresponding columns of any worksheet row. When the DATA USE CRITERIA command asks you 'From Range:' reply with the worksheet range that holds your criteria and all subsequent ACCESS commands will automatically use this criteria to return only those records that match.

For example, if in a record layout there are three fields lettered A B and C, and Field A is a name, Field B is a county, Field C is a credit limit. If you wanted to ACCESS only those records for 'Smith's' living in 'Kent' you simply type 'Smith' into Column A of a worksheet row and 'Kent' into Column B, make sure all other cells in the row are blank and issue the DATA USE CRITERIA command, giving the single row containing the criteria as the 'From Range:'.

The 'matching criteria' that you type into the worksheet can also contain special ~ matching symbols to tell VIZASTAR that you want to be more flexible than just 'give me records that match this exactly'.

*	-	Match On Any Ending
?	-	Match On Any Character In This Position
LEFT ARROW	-	Don't Match On Following Text
'&	-	Match If The Following Characters Are Found Anywhere In The Field
<	-	Match If Less Than The Following Text
>	-	Match If Greater Than The Following Text

You may also combine these special matching symbols to 'fine-tune' your criteria even more. For example:

	A	B	C
20	smith	kent	+C>500
21	jones	su*	+C<l000

If the CRITERIA range is set to A20:C20 then just 'all the Smith's living in Kent with a credit limit over 500' will be ACCESSable. If the CRITERIA range is set to include row 21 as well (i.e. A20:C21) then VIZAST AR will ALSO make ACCESSable 'all the Jones's who live in Surrey and Sussex with a credit limit less than 1000'.

Note that the special symbols apply JUST TO TEXT, if you want to match on ranges of NUMBERS then use the logical operators described in section 4.6. A match is made when the cell containing the formula is TRUE (i.e. NON ZERO). In the above example cells C20 and C21 contain formulas which will either show as 1 or 0 (TRUE or FALSE) depending on the number in field C of the current database record. Because the field letter is mentioned in the formula, the formula need not be typed into its corresponding field letter column.

You may include any number of rows in the CRITERIA range – so you can be extremely flexible about which records are let through.

Blank cells in the CRITERIA range are ignored. A completely blank row will allow ALL records to be accessed. Specify a blank row to CANCEL an existing CRITERIA range.

CRITERIA SUMMARY

When you specify a CRITERIA range you are limiting ACCESS to only those records that meet the criteria. To make the criteria more flexible, criteria can be entered into several rows. If the criteria is met in ANY row, the record can be ACCESS'ed. Note that upper and lower case text are treated the same when matching.

10.2 SETUP - DEFINING A DATABASE FILE RECORD LAYOUT

Purpose: To pre-define the layout and the processing of information to be displayed and stored when ACCESS'ing records within the current database file.

Command: DATA
SETUP

Sequence: From READY mode - Press the CBM key followed by D S, the current database file layout is then displayed. To use the further command options press the CBM key followed by the required option which are fully explained in the next section. To return back to the worksheet READY state press CBM and Q.

Notes: This command is used to completely define the way in which each of your information records are displayed and processed. It applies to the current database file in USE. Note that you may define up to 9 screens of layout PER RECORD as long as there is sufficient memory available. There is NO pre-set maximum file record size but if you have a large worksheet in memory either now or when you actually access the file you may be prevented from recalling or storing large records. In normal use you will be able to create and access records up to 8,000 characters in length. VIZASTAR does NOT store spaces left at the end of fields. See appendix for ways of calculating disk and memory usage.

TYPING THE LAYOUT

Defining a layout is quite straight forward. All you need do is to move around the screen layout typing any descriptive information that you want displayed along with every record. To define a particular field, just type a '<' character at the start and a '>' character to signify the end.

LETTERING (NAMING) THE FIELDS

At the start of each field you must give the field a letter code. In the range of A through to BL. Just like the column letters in a worksheet. The field containing the letter A is used as the KEY field. This is the way in which you can directly access your information records. There can only be one key. When you have entered the field start and end markers and the field letter code, the letter code will be displayed on the third line of the screen. If it is not displayed then you have probably exceeded the maximum field length of l20 characters.

Since most record layouts will use only one screen we have simplified the lettering process. When using only one screen ('card'), you need not specify field letters. VIZASTAR will internally letter each field. The first field will be called A and therefore MUST be the intended key. After that, each field in turn from left to right of each line is lettered in strict alphabetic sequence. So the second field will be B, the third C and so on.

FORMULA FIELDS

Notice that once you have typed a field letter code a rather familiar display appears at the top of the screen, yes !! just as you can define a cell formula anywhere in the worksheet you can also define a formula for any field in a database file (except the KEY field A). Just move the cursor onto the field that is to contain a formula and press the F1 function key.

Fields that have formulas become 'display only' fields and cannot be typed into when ACCESSing the record. Fields containing formulas are used to show the results of other fields such as totals, sales tax, V .A. T., discounts etc. The formulas can even reference directly into the current worksheet opening up all kinds of possibilities. And you can also reference a database record field from a worksheet formula, by omitting the row number.

For Example:

B:+C*0.15	:Multiplies field C by 15%
J:+G23*0.55-F	:Subtracts field F from 55% of cell G23
M:=G	:Display the same text as in field G
O:=C14	:Display the same text as in cell C14

Notice that references to database fields require that you omit the ROW NUMBER that you would normally use in a worksheet cell reference. Remember also the special 'text cell referencing' formulas explained earlier.

ALTERING AN EXISTING LAYOUT

One of the most unique and certainly flexible features of the VIZASTAR database manager is that you can change a file layout as often as you like. For example, if you left a phone number out of a mailing list layout you could add it later.

Issue DATA SETUP and put the new field or fields where you want. If you have already ADD'ed records to the file you must give these new fields letter codes that were not used in the old file layout. Also if you didn't type field letter codes in at all !! they should now be typed in. This is because VIZASTAR remembers the field letters of all the information that you put on disk.

Once this is done, SAVE the new layout. From now on you are able to DATA ACCESS the old records (naturally their phone number field will be blank) but be able to fill-in the phone number and ADD or REPLACE the records.

USING THE SETUP COMMANDS

To assist with the setting up of your record layout there are additional commands that are called upon by pressing the CBM key and selecting the required option. Once you have completed setting up your layout and saved it, select QUIT to return back to the worksheet READY mode.

10.3 SETUP - SETTING UP AND ALTERING A FILE LAYOUT

Purpose: To assist in the setting up or alteration of the current database file layout.

Command: FORMAT INSERT DELETE PAINT HIGH SAVE QUIT

Sequence: This sub-menu is unusual as it is called up by pressing the CBM key WHILE IN the DATA SETUP command. Select the required option or press Q to return directly back to the worksheet READY state.

Notes: Each of the SETUP commands are now discussed:-

FORMAT

This option lets you select the format of the field. You may select one of the following formats:

GENERAL INTEGER CURRENCY DATE SCI

If no format is specified the field will take-on the current worksheet GLOBAL format WHEN USED. For a full explanation of these format types see the CELL FORMAT command.

INSERT

While editing the record layout you may wish to insert a blank line in- between existing lines. The INSERT menu option will 'push down' all lines from the cursor position to the bottom of the screen. The last line of the screen will be removed from the layout.

DELETE

While editing the record layout you may wish to remove a whole line from in-between existing lines. The DELETE menu option will 'pull up' all lines onto the line with the cursor on it. A blank line will then be introduced at the foot of the screen.

HIGH

After selecting this option all characters that are typed or have the cursor moved over them have their colors reversed. So that spaces that were once white will appear blue and characters that were blue on a white background appear white on a blue square. As you will see - the effect is to highlight headings or perhaps to draw borders around related information.

HIGH is turned off by pressing the STOP key.

PAINT

Another way of drawing boxes is to use this menu option. PAINT asks you for the character that you would like to paint with. After selection VIZASTAR will place this character on the screen wherever you use the CRSR control keys. So that by keeping the CRSR key down you will be able to paint a line of characters. If you use any of the other keys they will continue to operate as normal. PAINT is turned off by pressing the STOP key.

It is possible to both HIGH and PAINT at the same time.

SAVE

When you have SETUP your file record layout use the SAVE command to have VIZASTAR keep a permanent copy on the current disk. This command asks 'Allow Duplicate Keys?', reply with 'y' or 'n'. This is used to prevent (reply ‘n') files such as invoicing records having duplicate invoice numbers. If you want to change status of this at any time, just issue DATA SETUP and then SAVE replying as required to this prompt.

DO NOT CHANGE DISKS while setting up your file layout. It must go back onto the same disk as the database that you last USE'd. If your file layout takes a while to setup use this command periodically so that in the event of system loss your efforts have not been wasted.

QUIT

Once you have SETUP your file record layout and SAVE'd it to disk then use the QUIT menu option to return back to the worksheet READY state.

Other Keys To Use While Setting Up Your Layout

CLR	- Blanks The Current Screen
INST	- Inserts a Space In Current Line
DEL	- Backspace and Delete A Character
F3	- Go To The Next Screen In The Layout
F4	- Go To The Previous Screen In The Layout
F1	- Enter/Amend A Field Formula

10.4 ACCESS - ACCESS THE CURRENT DATABASE FILE

Purpose: To view, recall, amend, delete and store information records in the current database file.

Command: DATA
ACCESS
KEY NEXT PRIOR FIRST LAST CURR ADD
REPLACE DELETE QUIT

Sequence: Press the CBM key followed by D A and then select the required access option.

Notes: You will 'stick' in this menu until you QUIT or press STOP.

Remember that if you have specified USE CRITERIA that all ACCESS operations will only return those records that match your specified criteria.

KEY

Used to instantly recall a record by the 'key' field. When setting up your record layout you will have identified which field is to be used as the KEY (by lettering it as 'a') to gain instant ACCESS to the entire record.

The cursor is moved down into the key field of the record layout. Type all or just part of the 'key' to the record that is to be accessed and press the F1 function key. If a record cannot be found that has this exact KEY then the next record with a higher key is displayed along with the message 'Record Not Found'.

NEXT

This menu option will display the next record in the file.

PRIOR

This menu option will display the previous record in the file.

FIRST

This menu option will display the very first record in the file.

LAST

This menu option will display the very last record in the file.

CURR

This menu option re-displays the most recently accessed record in the file.

ADD

This menu option is used to add fresh information to your database file. On selection VIZASTAR moves the cursor down to the first enterable field in the screen layout. If information from a previously accessed record is still on the screen then this is not cleared, as you may wish to re-use it. If not - then simply press the F2 function key to clear all the displayed fields.

If you wish to clear just a single field then move the cursor onto that field and press the CLR key, the CLR key clears a field FROM THE CURSOR - so you can re-use or type over existing fields and then just press the CLR key to clear to the end of the field. It could be called the ERASE TO END OF FIELD key; it is a useful key to remember.

If you decide to abandon the ADD command then press the STOP key to return back to the DATA menu.

When you want to add your new record to the database file, press the F1 function key. VIZASTAR then places your record in the correct alphabetical position within the current database file and returns you to the DATA menu.

REPLACE

This menu option is used to alter existing information (but NOT the key) in your database file. On selection VIZASTAR moves the cursor down to the first enterable field in the screen layout. Alter the record as you wish and press the F1 function key to REPLACE the existing record with the alterations you have made.

If you press the STOP key while making alterations VIZASTAR will abandon the REPLACE and return you back to the DATA command. Now select CURR if you want to re-display the original record.

Press the F2 function key to clear all the displayed fields. If you wish to clear just a single field then move the cursor onto that field and press the CLR key, the CLR key clears a field FROM THE CURSOR - so you can re-use or type over existing fields and then just press the CLR key to clear to the end of the field.

DELETE

This menu option removes the current record from the database file, freeing up the space it occupies on disk back into the database 'pool'. Once DELETE'ed, a record cannot be recovered. If there are no records in the file, 'Delete File Entry?' is asked. Reply 'y' or 'n' as required. Replying 'y' frees up the database directory entry, the file layout remains on the disk and can be re-used.

QUIT

This menu option will return you back into the worksheet READY state, closing the access channel to the disk drive and turning the disk light off.

10.5 TRANSFER - DATABASE AND WORKSHEET INFORMATION

Purpose: To copy the contents of the current worksheet row into database record memory or to copy database record memory into the current worksheet row. This is for building up reports, bringing in figures from disk to be worked on in the worksheet.

Command: DATA
TRANSFER
FROM-SHEET TO-SHEET

Sequence: Position the cell pointer on the row that is to be used for this operation. Press the CBM key followed by D T and then select F to copy the contents of the current worksheet row into the database record memory. Otherwise select T to copy the contents of the current database record into the current worksheet row.

Notes: The transfer is performed so that the database record fields and the columns in the worksheet row correspond exactly. So that a field lettered C will always be transferred into Column C of the worksheet and vice- versa. The transfer is made starting at the column that the cell pointer is currently on. This can be used to transfer just part of a record or row.

10.6 OTHER - DATABASE: FILE LIST, FOREIGN FILES, PRINTING

Purpose: To view a list of files (directory) contained in the current database. To import information from an external file created by another database system. To export information to an external file for word processing or linking to other systems. To print out a list of records in the current database file, using CRITERIA if set.

Command: DATA
OTHER
DIRECTORY IMPORT EXPORT REPORT

Sequence: Press the CBM key followed by D O and then select the required option.

Notes: Each command is now discussed:-

DIRECTORY

As you USE files in a database VIZASTAR keeps track of each of the files, how many records are stored on the disk and how many disk blocks have been allocated for use by the database and each of the files. The DIRECTORY command displays a list of all files known to the database along with the number of records and VIZASTAR disk slots (half blocks) used.

The number in the bottom left border is the number of disk slots VIZASTAR has available before it has to call upon fresh disk slots from outside the database. This information is provided for users who understand the disk system in some detail and wish to monitor disk usage. If you have a particularly large volume of information to keep on the disk it would be advisable to monitor just how much room your files are occupying and plan ahead.

Note that the last three files USE'd within this database are marked with a '+' sign. This means that your current position in these files is known and their file layouts are resident in memory. For users who wish to process several files at once this provides fast and ordered access. The current database file name is displayed in the screen heading.

EXPORTING INFORMATION RECORDS

The EXPORT command is the link to the outside world. Any information contained within a database file can be sent out to a standard CBM ASCII sequential file. VIZASTAR sends out information field by field, in any order and is even able to repeat fields. If you wish to send out part of a file then set the CRITERIA in the usual way and the EXPORT command will just send out those records that meet the established criteria.

Using this command you can link information into the VIZAWRITE 64 word processor with the MERGE (CBM SHIFT M) command, by replying with an 's' to the 'Merge: Page?' prompt. Use the FILE MERGE command to merge an EXPORTed file into VIZAWRITE CLASSIC. You can also use this file for MAIL MERGING (document filling) in VIZAWRITE.

The EXPORT command asks for a file name and the cell reference CONTAINING the field letter codes to be exported. These field letter codes should be entered one after another with each one separated by a single space. You must supply a valid range or the 'Invalid Range' message will appear.

For example A15:a g f I g

If A15 is used as the EXPORT cell reference, then fields a g f I g would be sent out to the sequential file for each database record extracted. Note that they can be in any order and can be repeated if you wish. A 'carriage return' (CHR$(13)) is also sent after each field.

The ability to repeat fields is clearly invaluable if the word processing document to be 'filled out' needs the same information to appear in two different places on each letter/form/label. But this also means that you can produce duplicate/triplicate etc. copies all in one go, without having to collate them later or do the same word processing print run several times.

For example A15:a g f l g a g f l g a g f l g

If cell A15 was used as the EXPORT cell reference - for each database record in the file VIZASTAR sends out three 'lots' of information instead of the one 'lot' in the previous example.

USING FIELD 'RANGES'

Just in the way that you specify 'ranges' in the worksheet you can specify field 'ranges' too.

So if you wanted to EXPORT fields' b c d e f g you can specify them as a range.

For example A15:a b:g c x

This will send out field 'a' followed by fields' b c d e f g and finally x.

If you want to export all fields for each record in the database file, give the range with the starting and ending field.

For example A15:a:j

This would be used if you have 10 fields, a through j.

If you did not give the valid last field and instead gave 'a:b1' meaning that you wanted all fields, VIZASTAR would send fields a through j - then for k to b1 it would send empty fields (just RETURNs - CHR$(13)), which is probably not what you intended.

EXPORTING FROM THE WORKSHEET

You can also include worksheet cell references mixed in with field references.

For example A15:a b c1 d2 g

For each record in the database file VIZASTAR sends out fields a b from the database followed by c1 and d1 worksheet cells followed field g from the database.

If you had just one record in a file and only mentioned worksheet cells in this list you could EXPORT areas of just your worksheet. If you need to do this - set up a 'dummy' file with just one field in it. ADD one record and then when you need to EXPORT only worksheet information USE this file and then VIZASTAR will just EXPORT worksheet cells the once.

IMPORTING INTO A DATABASE FILE

The IMPORT command allows you to bring into a database file, information from a standard CBM ASCII sequential file. The IMPORT command can be made to re-arrange the incoming data or even skip parts of it. As with the EXPORT command you must supply the name of the file and a single cell reference that contains the field letters that the incoming data is to be placed into.

For example A15:a b c d

Will bring in the first four fields from the sequential file and place them in database fields a b c and d. The database record will be ADD'ed to the database file and the next four fields will be read in from the sequential file.

It is important that you establish how many fields you have in the sequential file that make up a 'set' of information, otherwise the database records that are ADD'ed and the sequential file that they came from will get progressively out of step !!

If you have information in the sequential file that you DO NOT WANT TO IMPORT then you can specify a worksheet cell reference instead of a database field letter.

For example B15:a b w21 d

This will bring in data for fields a and b then skip over the next sequential file field (by placing it in the worksheet instead of the database record) and then bring in data for field d. The database record will then be ADD'ed to the file and the process will continue until the sequential file becomes empty.

As with the EXPORT command you can specify a field 'range' instead of having to type each field letter out.

For example A15:a z g:k

Will bring in data for fields a z and then g h i j k.

10.7 REPORT - PRINTING A DATABASE REPORT

Purpose: To print out a list of records in the current database file, using any criteria (if set). To print fields in alphabetical (field letter order) either ACROSS or DOWN the page. Alternatively to recalculate and print a RANGE of the worksheet for each record accessed.

Command: DATA
OTHER
REPORT
ACROSS DOWN RANGE

Options: From Range:

Sequence: Press the CBM key followed by D O R and then press: A to print fields ACROSS the page, D to print fields DOWN the page, R to print from a RANGE in the worksheet.

Notes: ACROSS prints each field across the page in one line, each field is separated by two spaces. If there is not enough room to print within the current PRINT margins - the remainder is ignored. You may specify which field it is to start with by positioning the cell pointer to the corresponding column before issuing the DATA OTHER REPORT command.

DOWN will print each field in each record down the page with each field printed on a separate line. Intermediate blank fields cause a blank line to be printed. However, if there are only blank fields left in the record VIZASTAR prints a separation blank line and goes on to the next record.

Note that ACROSS and DOWN print out each field in alphabetical field letter order (i.e. field a followed by field b followed by field c and so on).

The REPORT RANGE command prompts for a worksheet range. For each record in the database file a worksheet recalculation takes place and the specified worksheet cell range is printed out. This is suitable for your own report layouts. By using 'text cell references' for fields and worksheet cells, such as '=a' '=d101', you are able to lay out a report within the range.

For example if the following 'text cell references' were typed into cells A1 through A4, they would always show the contents of fields A through D of the current database record. If the DATA OTHER REPORT RANGE 'From Range' is given as a1:a4, VIZASTAR will access each record from the current database file and print out just these four fields.

	A
1	=a
2	=b
3	=c
4	=d
5	

Unlike the REPORT DOWN command VIZASTAR does not print a separation line between each RANGE print so you should always 'over specify' the range to include a blank cell for each required spacing line. In the above example the 'From Range' should be given as a1:a5 so that a blank line is left between each RANGE print.

Clearly the above example is very simple; you could easily add some descriptions, worksheet formulas, dates etc.

Don't forget that the REPORT command only processes records from the database file that meet any CRITERIA in USE. So you can print selective reports. Also the PRINT OPTIONS settings are used in deciding when to print headers, footers and page skips.

SECTION 11 - THE GRAPH COMMAND

VIZASTAR's high resolution display makes it easy to produce bar graphs based on figures in the worksheet. Using the 'Window' system you are able to split the screen such that figures and text can appear in one window while the graph is displayed in another. The graphing is quite simple in that you may only display a bar graph for a single range of cells.

11.1 GRAPH - DRAW BAR AND PIE GRAPHS

Purpose: To draw a bar graph based on a cell range from within the worksheet or current database record. To remove a displayed graph from the current window. To draw or print PIE charts or MULTIBAR (skyscraper) bar charts.

Command: GRAPH

Options: BAR OFF MULTIBAR PIE
Range: Scale:

Sequence: Press the CBM key followed by G and then select the required option. Select B to draw a BAR graph, O to remove an existing BAR graph from the display. Select M to draw MULTIple color BAR graphs, select P to draw an exploded PIE chart. Press SPACE or STOP to return to VIZASTAR from MULTIBAR or PIE graphs.

Notes:

Enter the cell range that the graph is to be based upon and press RETURN. For BAR graphs enter the scale for the graph to be drawn in. Each of these units will be equal to one screen row.

To draw a graph based on figures in the current database record, specify just a RANGE of field letters.

For example:

Range:G:J - graphs fields G H I and J.

If you draw a BAR graph VIZASTAR will continually re-draw the graph as you move about the worksheet. If you change any of the figures within the cell range that is being graphed the graph will automatically re-draw if you have set automatic re-calculation on (CALC AUTO) or press the F7 function key while in the worksheet READY state.

If you FILE SAVE the worksheet, a BAR graph will be saved along with the worksheet so that when the worksheet is subsequently recalled - the graph is re-displayed.

11.2 COLOR GRAPHICS

Unlike all other commands in VIZASTAR, the MULTIBAR and PIE commands can call up routines from disk, when printing. It is therefore necessary to insert the system disk before calling up these commands if you wish to obtain a printout. A major advantage in this way of operating is that we have been able to include support for a wide range of dot-matrix printers. This includes the Commodore MCS- 801 color printer.

MULTIBAR

The MULTIBAR graphing allows from one to four rows of figures to. Be graphed simultaneously on a separate color screen. The display shows each row of bars one stacked behind the other, giving a three dimensional effect. The numbers must be taken from parts of rows, you cannot specify columns. Use SHEET COPY or SHEET MOVE to transfer a column into a row. MUL TIBAR prompts with 'From Range:', here are some examples:-

	A	B	C
1	78.25	45.65	50.75
2	39.65	74.35	25.65
3	55.58	89.65	51.01
4	45.25	22.10	78.65

Specify the range A1:C4 to have four rows of bars graphed in MULTIBAR. The scaling is automatically performed. If you wanted to graph just rows 1 and 2 then reduce the range to A1:C2. The first row in the range corresponds to the row at the back of the graph, working forwards for subsequent rows in the range. You will notice that depending on how many figures you have in a row, MULTIBAR will show either wide or narrow bars.

If you specify just one row to be graphed, MULTIBAR can graph up to 33 numbers, for two rows MULTIBAR can graph up to 22 numbers, for three rows MULTIBAR graphs up to 17 numbers and if you specify four rows, up to 13 numbers can be graphed.

The MULTIBAR graph is intentionally drawn slowly on the screen; hold the SHIFT key down to have the graph instantly drawn. Once drawn, the graph can be 'scrolled' up and down.

The total graphing area is, in fact, four times the size of the screen. Initially the graph is scaled and drawn to show the highest bar within the screen size. If you press F1, the graph is re-drawn so that the highest bar is within the total graphing area. To see it you will Need to 'scroll up' using the CRSR UP key. Press F1 again to re-draw the graph within the screen height.

This double-height option is provided to give greater accuracy to the graph and can also be set prior to printing to get a full size graph report.

LABELLING A MULTIBAR GRAPH

You will probably want to put some descriptions on your graph. There's not much room left but you can 'label' certain parts of the graph by including text 'next-to' and 'above' the numbers in the row range. For example:-

	A	B	C	D
0		JAN	FEB	MAR
1	*1981*	78.25	45.65	50.75
2	*1982*	39.65	74.35	25.65
3	*1983*	55.58	89.65	51.01
4	*1984*	45.25	22.10	78.65

If the MULTIBAR range is given as A0:D4, MULTIBAR will see that the first cell (A0) in the range is empty and assume that the row range is 'surrounded' by descriptive information. The JAN FEB MAR descriptions are then displayed at the base of the graph. The *1981* *1982* *1983* *1984* labels are placed next to each graphed row.

PRINTING A MULTIBAR GRAPH

If you have a 'footer cell' set in the PRINT OPTIONS menu, this is printed as an extra line at the base line of the graph. If you have a 'header cell' set this will form a boxed title to the graph. The footer contents are automatically 'tabulated' along the base of the graph. This means that every SPACE in the footer text is taken as 'go to the next bar'.

The text cell prefix' (single quote) can be used in the header text at both the start AND end of the text to force SPACES to show at either end of the graph title box. The single quotes are not printed.

To print - put the system disk in the drive and press the number key corresponding to your particular printer. MULTIBAR will use the PRINT OPTIONS settings for line feeding and whether printing is either CBM serial, user port parallel or RS-232 serial.

1 EPSON FX-80
2 EPSON MX-80
3 MPS-801
4 MCS-801
5 SHINWA CP-80

On EPSON compatible printers such as the STAR GEMINI select key number 2 or key number 5.

Select the height of graph by pressing F1 to suit. Press STOP to abandon printing. Press SHIFT and the printer number key to print 'filled-in' bars.

After printing, VIZASTAR returns to the worksheet READY mode.

PIE

The PIE graph displays up to 12 numbers by representing their magnitude as sections of a circle. Each section of the circle is shown in a different color and can be labeled with descriptive text. Please note that due to hardware limitations some color 'bleeding' will show when particularly small sections are graphed. The numbers to be graphed are taken (like MULTIBAR) from a part of a row, they cannot be taken from a column. Use SHEET COPY or SHEET MOVE to transfer a column into a row. PIE prompts with 'Enter Range:' here is an example:-

	A	B	C
1	JAN	FEB	MAR
2	39.65	74.35	25.65

Specify the range A2:C2 to have the four numbers drawn in a PIE chart. Each 'slice' will be labeled with the number it is drawn from. If you wish to manually label each slice, place the label information immediately above the row containing the numbers to be graphed and include this row in the PIE 'From Range'. In the above example specify A1:C2 to have the three slices labeled JAN, FEB, MAR.

If a header cell is specified in the PRINT OPTIONS settings this will form the boxed title on the screen and in the PIE chart when printed.

PRINTING A PIE CHART

To print - put the system disk in the drive and press the number key corresponding to your particular printer. PIE will use the PRINT OPTIONS settings for line feeding and whether printing is either CBM serial or user port parallel.

1	EPSON FX-80
2	EPSON MX-80
3	MPS-801
4	MCS-801
5	SHINWA CP-80

On EPSON compatible printers such as the STAR GEMINI select key number 2 or key number 5.

Press SHIFT and the printer number key to have a double-sized PIE chart printed on Epson and Shinwa printers.

After printing, VIZASTAR returns to the worksheet READY mode.

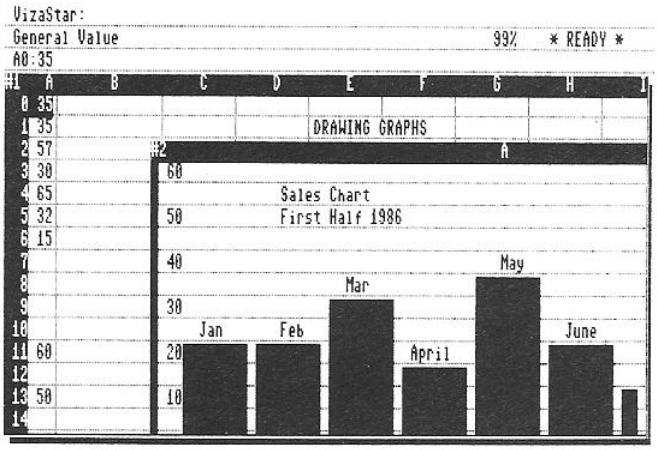

Fig. 3 A GRAPH BAR worksheet display.

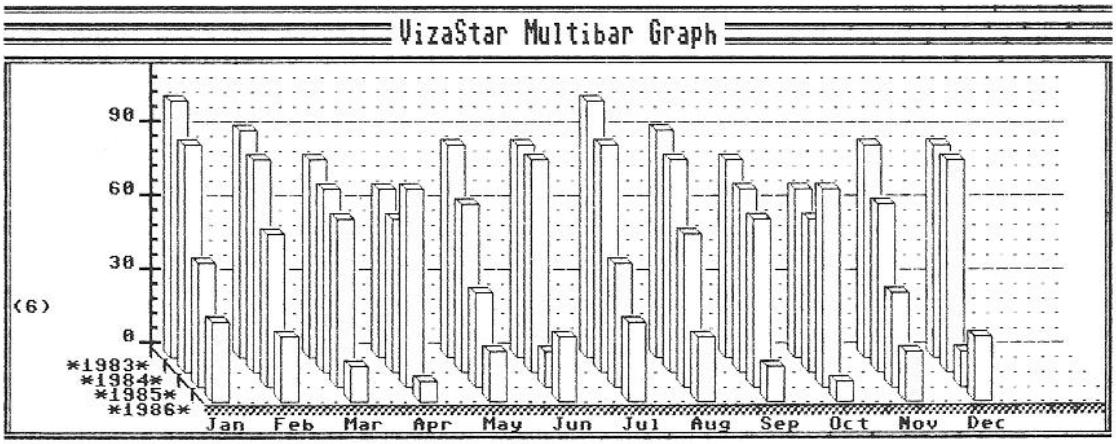

Fig. 4 A GRAPH MULTIBAR print.

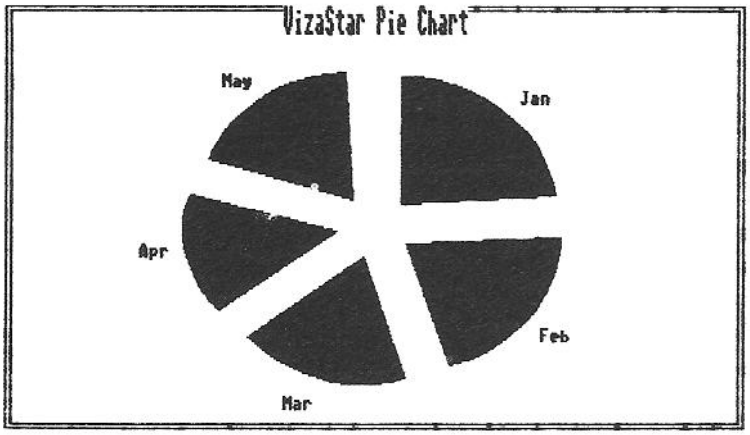

Fig. 5 A GRAPH PIE print.

SECTION 12 - INFORMATION MAINTENANCE

One major drawback in using computers to hold vital information is the ease with which information can be completely and irretrievably lost. Although the computer and its peripherals are normally extremely reliable in operation, a computer's memory is only an electronic pulse away from a total memory loss. Whatever the cause, you will at some time 'lose' some vital information. So you must be vigilant at all times and take the necessary steps to reduce this loss to the absolute minimum.

When you are developing a worksheet, FILE SAVE it to disk regularly and keep several copies on several disks. You won't go far wrong if you keep saying to yourself 'How long will it take to get back to this position if the power suddenly fails?'

12.1 BACKING UP YOUR DATABASE

There is only one way you can keep 'back-ups' (copies) of your database. On the supplied VIZASTAR disk you will find a program called "starback". This program is loaded and run completely separately from VIZASTAR. Turn the computer OFF, place the system disk in the drive, hold down the ALT key and switch the computer ON. The "starback" program will now BOOT automatically from the system disk.

Follow the program instructions, the program will copy an entire disk (known as the SOURCE disk) onto a new disk (known as the TARGET disk). The TARGET disk will be completely ERASED during this process. So make sure it does not contain valuable information.

The backup is performed in several stages, and you will need to swap the two disks in and out of the drive. At the end of the backup you will have two identical disks. This program can also be used to copy any unprotected disk.

We recommend that you keep a 'cycle' of back-up disks, if you use your database throughout the day, you must always take a backup at the end of each day. Keep a weekly cycle of 5 disks and each week make an extra backup to go into a monthly cycle of 4 disks. This means that if you lose your information you will always be able to go back to the end of the previous day, back a whole week and as far back as a whole month.

If one of your database disks becomes either physically or 'logically' corrupt ('logically' means that the disk has become garbled and although readable makes no sense to VIZASTAR) you may not ACCESS the part that is corrupted for some time. In which case you will be sitting on a time bomb!!

A good way to check that a particular database file is healthy is to EXPORT it. This will ensure that all the records in the file are readable and it will also create a compact copy on the same disk.

We don't want to alarm you with 'doom and gloom'; we are making sure that you appreciate the risks as well as the benefits of a database system.

12.2 ESTIMATING DATABASE CAPACITY

VIZASTAR treats a 1541 or 1570 disk as if it had 1200 filing slots, or 2400 for a 1571 disk that has been formatted as double sided. Some of these slots may have already been used for non-database files. Each slot can hold 124 characters of data. VIZASTAR will need to use up a whole slot even if there are only a few characters to be put in it. VIZASTAR will use as many slots as are needed to hold a database record.

When VIZASTAR calculates how many characters it has to put into one or more slots it adds up just the visible characters and adds two characters for each field that contains data.

For example a name and address file:

	Name	<a.....>
	Company	<b.....>
	Street	<c.....>
	Town	<d.....>
	County	<e.....>
	Postcode	<f.....>

Length		
8+2	Name	<Mr..Zing.....>
17+2	Company	<Zingo.Bottle.Tops...>
11+2	Street	<Zingo.House.....>
6+2	Town	<Topton.....>
11+2	County	<West.Bottle..>
0+0	Postcode	<.....>
=====		
= 63 =		
=====		

You can see that although field f is included in the file layout it requires absolutely no space if you leave it blank. You can also see that spaces left at the end of entered fields also require absolutely no space. So in this example VIZASTAR will require just one slot to hold the 63 characters. Slots can't be shared so there will be 61 unused characters left in the slot. If you had a completely unused disk you could store 1,200 records like this before you ran out of slots or 2,400 on a 1571 disk.

VIZASTAR also maintains some of its own slots to keep track of what's stored in each of the files. These don't normally take up much room but there will be occasions when VIZASTAR steals a few slots for its own use which may reduce the number of records that you can hold.

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SECTION 13 - AUTOMATING VIZASTAR

13.1 EXECUTION LISTS

One of the most powerful features in VIZASTAR is the ability to automate its operations. It is also the hardest to master!! So before you attempt to use what we call EXEC's, you should be quite familiar with VIZASTAR. The EXEC processor uses sequences of 'keystrokes' that you have typed into a column in the worksheet. These keystrokes are entered in almost the same way as when you use VIZASTAR manually.

EXECUTING THE KEYSTROKES

So if you have a report to produce from many parts of the worksheet, you need only set up the print command requests the once. Whenever you need the report just press the 'EXEC' key (F8) and VIZASTAR will produce the report entirely automatically. This facility is ideal when you are setting up a worksheet or a database application for inexperienced users. It can just ask them for information to put in the worksheet or database without the operator having to first learn about the system.

EXTRA EXEC COMMANDS

In addition to the normal VIZASTAR operations the EXEC processor has extra commands all of its own. These are used to 'control the flow' through the EXEC List. So that you can 'go to' different parts of an EXEC List depending on a particular situation. So you may decide to print a special kind of report at the beginning of the month, and yet use the same EXEC List for weekly reports. In addition to 'controlling' the EXEC List, there is a command to display a message to the screen and a special kind of keystroke that 'waits' for a reply to be entered.

TAKE CARE!!

You can use the EXEC facility for just entering repetitious information or perhaps just to USE a DATABASE and a FILE instead of typing their names in every time. If you do decide to get adventurous – be prepared for some puzzling situations - you will be entering the world of programming, and programs do what you tell them to do – they can't read your thoughts.

So plan your use of the EXEC facility very carefully. You will find a 'commented' EXEC List supplied on the disk (see TUTOR file). Take a look at this before you start, understand it and then try and create a simple EXEC to start with. Build it up slowly, one stage at a time and make sure that each part works in exactly the way you want it to before continuing onto the next.

SAVE YOUR WORK REGULARLY

As you run through each stage and get it working remember to SAVE the worksheet containing the EXEC. By doing this you can always revert back to the previous version if something goes terribly wrong.

ENTERING CONTROL KEYS

Note that when typing an EXEC the CBM key is always typed as a '/'. Control keys such as the CRSR and function keys are entered by pressing the CTRL key (and releasing it) followed by the control key you want to enter. You then see the control key described (such as [down] for CRSR DOWN).

13.2 EXEC EXAMPLES

The first example is entered in cells A0 to A4; the notes made in column C are just there to help you understand each line. This example first of all goes to the cell location D0, and then proceeds to enter number values into the next three cells. Underneath the three cells a formula is entered that adds them all up. The EXEC List then stops as it has reached a blank cell.

You will see that when entering a number or a formula into an EXEC List you MUST precede it by a single quote symbol. This particular example is of little practical use, but if you type it in and execute it (press F8) then it will help you to understand the idea of EXEC Lists.

	A	B	C
0	[f5]dO[ret]		Go To Cell D0
1	'+25.65[down]		Enter Numbers
2	'+15.25[down]		In 3 rows
3	'+65.50[down]		Down The Column
4	'+@SUM(d0:d2)		[ret] And Total Them

This second example introduces the special /x commands that the EXEC Facility provides in order to 'control the flow' through the list. This example needs the VIZASTAR disk, it will print out line by line all the records in the supplied database DBASE CUSTOMER file. You can easily amend the /dud and /duf entries for your own personal database and files.

	A	B	C
0	[f5]a14[ret]		Go To Cell A14
1	/duddbase[ret]		Use The dbase Database
2	/dufcustomer[ret]		Use The Customer File
3	/xe customer end		Set End Of File Label
4	/dafq		Access The First Record
5	/x1 loop		An EXEC List LABEL
6	/dtt		Transfer To The Sheet
7	/pr		Print The Customer Info
8	/danq		Access The Next Record
9	/xg loop		GO TO loop (A5)
10	/x1 end		End Of File Label
11	q		Quit From Data Menu
12			An Empty Cell Terminates The EXEC

You can see from this example how '/duddbase' is the same as if you had pressed the CBM key (the slash) and selected DATA USE DATABASE, typed 'dbase' and then pressed the RETURN key ([ret]). As we mentioned earlier you will need to be quite familiar with VIZASTAR before you are able to enter these keystrokes 'blind'.

13.3 THE EXEC LIST COMMANDS + CONTROL KEYS

THE RULES

An EXEC List is entered into a single column, each cell entry must have a text FORMAT, and so that formulas and numbers must be entered starting with a single quote (SHIFT 7).

The EXEC ends when a blank or NON-text cell is reached.

VIZAST AR takes each visible character as if it had been typed, with the exception of 'I' which is treated as equivalent to pressing the CBM key.

Other control keys such as HOME, RETURN, and CRSR are entered into an EXEC list by first pressing and releasing the CTRL key, followed by pressing the required control key. Special bracket characters are automatically placed around a description of the control keystroke.

Because slash (f) is used to represent the CBM command key, it should not be used in any other context. Specifically avoid its use in names of EXEC labels, database names and file names.

An EXEC, by default, should start in cell AD. The SHEET XEC command is used to set a different starting cell. If a FILE LOAD is executed during the course of an EXEC - VIZAST AR will continue executing keystrokes from the new worksheet. It will start from wherever SHEET XEC was set to when last using the newly loaded worksheet.

CONTROL KEY ENTRIES

-DISPLAYED-		-TYPED-
[UP]	-	CTRL CRSR UP
[DOWN]	-	CTRL CRSR DOWN
[LEFT]	-	CTRL CRSR LEFT
[RIGHT]	-	CTRL CRSR RIGHT
[RET]	-	CTRL RETURN
[STOP]	-	CTRL STOP
[HOME]	-	CTRL HOME
[CLR]	-	CTRL CLR
[INST]	-	CTRL INST
[DEL]	-	CTRL DEL
[F1]	-	CTRL F1
[F2]	-	CTRL F2
[F3]	-	CTRL F3
[F4]	-	CTRL F4
[F5]	-	CTRL F5
[F6]	-	CTRL F6
[F7]	-	CTRL F7
[F8]	-	CTRL F8
[WAIT]	-	CTRL w

13.4 THE SPECIAL EXEC COMMANDS

The extra EXEC commands are quite unlike the normal menu commands. They are provided solely to control the order in which the EXEC List keystrokes are processed. They supply the necessary assistance to vary the way your EXEC works based on worksheet or database content.

An additional control key is supplied for use with EXEC's, this is 'CTRL w' which enters [wait] into the EXEC List. When VIZASTAR comes across a [wait] it temporarily returns control to the keyboard, until the RETURN key is pressed. This can be used to pause an EXEC to allow the operator to enter information into a database record or a cell in the worksheet. Once the RETURN key is pressed - the EXEC continues where it left off.

Note that although here we have printed the EXEC commands in capital letters they should be typed in lower case. Labels, database file names can be typed in either letter case. Be careful that you use letter case consistently.

THE /X EXEC COMMANDS

IF formula is true, go to label	- /XI formula label
LABEL this cell in the List	- /XL label
GO TO this labeled cell	- /XG label
Go to this labeled cell when the END of this FILE has been reached.	- /XE file label
Display this PROMPT on screen	- /XP user-prompt
QUIT(abandon) the EXEC List	- /XQ quit the EXEC

These special commands should always be entered into their own cell.

VARIABLE CELL REFERENCES

Often it will be necessary to refer to the CURRENT CELL from within a /XI command and general 'Range' prompts. Use a '?' to refer to the current cell address.

For example if the cell pointer was at cell A20:

/XI ?>30 OVER	If cell A20 is greater than 30 then go to the cell labeled OVER.

/XI 'IF' COMMAND

If the formula is true then VIZASTAR continues reading keystrokes from the cell that has a matching /XL label. Equivalent to an IF.. THEN GOTO label. The formula rules are the same as if it were entered directly into a cell.

For example:

/XI A1>0 DEBTOR	If cell A1 is greater than 0, go to the cell labeled DEBTOR.

/XL 'LABEL' COMMAND

This command gives the cell an 'identity' which we have called a 'label'. This label can be up to 8 characters in length. The /XI /XG /XE commands can be used to re-direct control to a cell with an /XL label.

For Example:

/XL DEBTOR	This cell has a label marked DEBTOR.

/XG 'GO TO LABEL' COMMAND

This is used to 'Go To' the cell marked with the named label.

For Example:

/XG DEBTOR	Go to the cell labeled DEBTOR

/XE 'END OF FILE' COMMAND

When reading through a database file, you may wish to perform some special keystrokes when you reach the end. This command needs to know the name of the file concerned and the label of a cell to 'go to'. Note that as soon as the end of the named file has been reached (during a DATA ACCESS) this label is 'gone to'. So you may have to place an extra QUIT in the EXEC to return back to the worksheet (see earlier example).

For Example:

/XE CUSTOMER DEBTOR	When the end of the CUSTOMER file has been reached go to the cell marked with a /XL DEBTOR.

This command should be entered AFTER the database file that it refers to has been USE'd. If several /XE commands for the same named file are executed, it is always the latest one that is actioned when reaching the end of the named file.

/XP 'PROMPT USER' COMMAND

This command displays the prompt in the screen footing and continues reading keystrokes from the next cell in the column. Used before a CTRL w to advise the user what to enter.

For Example:

```
/XP Enter The Next Invoice Number
```

Just enter a /XP without a prompt if you wish to clear a previous prompt.

/XQ 'QUIT THE EXEC' COMMAND

This command terminates the EXEC; returning control to the keyboard. The EXEC can be manually halted at any time by pressing the STOP key. If the EXEC was waiting (CTRL-w) and STOP was pressed it will automatically restart the next time RETURN is pressed. To completely halt an EXEC press the F6 function key.

USING THE 'WAIT' CONTROL KEY

We have already discussed that CTRL w enters a [wait] into an EXEC List, this example shows the kind of use that it can be put to.

A	B	C
0 [f5]a8[ret]		Go To Cell A8
1 /xl NEXT		Label
2 /xp Enter Next Number		
3 [f1][wait]		Edit Cell
4 [down]		Down The Column
5 /xg NEXT		Keep Doing It

You can see that it first goes to cell A8, an EXEC label is then set so that the same keystrokes can be processed by the EXEC over and over again. The /XP informs the user what to do, the [f1] enters the worksheet EDIT mode. The [wait] then suspends the EXEC, this gives control back to the user so that they can enter the number in. The user types a number and on pressing RETURN, the EXEC automatically resumes by moving the cursor [down] onto the next cell. The /XG command then re-directs the EXEC back up to cell A1 and the cycle repeats.

This EXEC would continue indefinitely until the user pressed the F6 key.

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APPENDIX

APPENDIX A1. SYSTEM PROMPTS AND MESSAGES

A Database Not In Use

Either a DATA USE FILE, DATA SETUP or a DATA ACCESS has failed because there is no DATABASE currently in USE. USE a DATABASE and retry.

A File Not In Use

Either a DATA SETUP or a DATA ACCESS has failed because there is no FILE currently in USE. USE a FILE and retry.

Allow Duplicate Keys?

During a SAVE of a file layout, are records in this file allowed to have the same keys. Reply 'y' to say 'yes- allow it'. Reply 'n' to say 'no-they must not'.

Column BL Is Not Empty

An attempt to insert or move a column has failed because the rightmost column BL is not completely empty.

Database Directory Is Full

The maximum of 15 files in a VIZASTAR database has been reached. Place the proposed file in a separate database or delete all records and the file entry in an unwanted file.

Delete File Entry?

On issuing a DATA ACCESS DELETE, VIZASTAR has found that there are no records in the file to delete and is therefore asking if the database directory entry for the file should be removed. Reply 'y' or 'n' as required.

End Of File

You cannot ACCESS NEXT when at the end of the file.

F1=text F3=background F7=default

Select the required screen color combination using the function keys. If you go past the color you want then use F2 and F4 to step back.

File Is Empty

The file that you are attempting to ACCESS has no information in it.

Invalid Formula

Incorrect syntax has been used in the current formula. Correct and press RETURN, press STOP to abandon.

Memory Is Full

The VIZASTAR memory has been completely used up by a worksheet and database. Erase part of the worksheet or issue a USE DATABASE command to free up space occupied by FILE layouts.

Missing Identifier

When setting up a file layout you have not placed a field letter code in the first position of a field. Correct and SAVE again.

Missing Key Field

When storing a record you have not entered into the key field. It cannot be left blank. It can occur on an IMPORT if the incoming data is incorrect or has more or less fields than specified in the IMPORT field letter list.

Not Allowed - Duplicate Key

During a DATA ACCESS ADD or IMPORT, the key field is the same as an existing record in the file. When the file layout was SAVE'd, duplicate keys were said to be not allowed. DATA SETUP CBM SAVE and say 'yes' it you wish to change the status.

Not Known - Shall I Create It ?

Either a DATABASE or a FILE that has been USE'ed is not known on the current disk. Press 'y' to create this database or file. If DATA USE DATABASE - press 'n' to release memory occupied by file layouts associated with the last USE'd database. Press STOP to abandon the command.

Overlapped Window

The F5 Go To key has been used to go to a window that is completely covered by another window. Close the covering window first.

Record Added

The database file record has been successfully stored on disk.

Record Deleted

The database file record has been successfully removed from the disk.

Record Not Found

On issuing a DATA ACCESS KEY and supplying the key of the record to be accessed, VIZASTAR is not able to locate a database file record that EXACTLY matches your requirement. The record with the closest key has been located and displayed instead.

Record Replaced

The existing database file record has been successfully replaced by the information supplied.

Row 999 Is Not Empty

An attempt to insert or move a row has failed because the last row in the sheet is not completely empty.

Start Of File

You cannot ACCESS PRIOR to the start of the file.

Window Is Not Open

The F5 Go To key has been used to go to an unused window number.

Wrong Type Of File

Although the file name and suffix is correct, this file has not been created by VIZASTAR.

APPENDIX A2. TABLE OF LIMITS AND RANGES

Displayed Width of Worksheet Cell	3 to 75 Characters
Maximum Length Of Cell Entry	120 Characters
Valid Range Of Worksheet Columns	A through BL
Valid Range Of Worksheet Rows	0 through 999
Maximum Windows In Worksheet	9
Maximum Databases Per Disk	120
Maximum Files Per Database	15
Maximum Screens Per Layout	9
Maximum Fields Per Record	64, Named A through E!,L
Maximum Characters Per Field	120
Maximum Characters Per Record	8000, (Shares Memory
Maximum Records Per File	65535 (1200 on 1541)
Number Of Keys Per Record	1
Maximum Significant Chars In Key	30

APPENDIX A3. SUMMARY OF KEYS USED

F1	- Edit/Point/ Add/Replace/Key /Start Print
F2	- Point ($ Absolute)/Clear All Fields
F3	- Next 15 Rows/Next Screen In Layout
F4	- Previous 15 Rows/Previous Screen In Layout
F5	- Go To Cell/Window Number
F6	- Halt EXEC
F7	- Recalculate
F8	- Start EXEC, Clear a WAIT in EXEC.
CLR	- Clear To End Of Field Or Cell Entry
STOP	- Use It At Any Time To Halt Current Activity
CBM	- Enter Menu Select Mode To Issue A Command
SPACE	- On A Menu, Cycle Forward Through Menu
SHIFT SPACE	- On A Menu, Cycle Back Through Menu

APPENDIX A4. EPSON COMPATIBLE PRINTER CODES

For use in the PRINT OPTIONS setup cell.

	14		Enlarged Mode ON		20	Enlarged Mode OFF
	15		Condensed Mode ON		18	Condensed Mode OFF
27	69		Emphasized Mode ON	27	70	Emphasized Mode OFF
27	52		Italic Set ON	27	53	Italic Set OFF
27	83	0	Superscript ON	27	84	Superscript OFF
27	83	1	Subscript ON	27	84	Subscript OFF
27	77		Elite Mode ON*	27	80	Elite Mode OFF*

* Not Available On SHINWA CP-80

APPENDIX A5. ASCII CHARACTER CODES

000	NULL	043	+	086	V
001	SOH	044	,	087	W
002	SIX	045	-	088	X
003	ETX	046	.	089	Y
004	EOT	047	/	090	Z
005	ENQ	048	0	091	[
006	ACK	049	1	092	\
007	BEL	050	2	093	]
008	BS	051	3	094	↑
009	HT	052	4	095	←
010	LF	053	5	096	space
011	VT	054	6	097	a
012	FF	055	7	098	b
013	CR	056	8	099	c
014	SO	057	9	100	d
015	SI	058	:	101	e
016	DLE	059	;	102	f
017	DCI	060	LT	103	g
018	DC2	061	=	104	h
019	DC3	062	GT	105	i
020	DC4	063	?	106	j
021	NAK	064	@	107	k
022	SYN	065	A	108	l
023	ETB	066	B	109	m
024	CAN	067	C	110	n
025	EM	068	D	111	o
026	SUB	069	E	112	p
027	ESCAPE	070	F	113	q
028	FS	071	G	114	r
029	GS	072	H	115	s
030	RS	073	I	116	t
031	US	074	J	117	u
032	SPACE	075	K	118	v
033	!	076	L	119	w
034	“	077	M	120	x
035	½	078	N	121	y
036	$	079	O	122	z
037	%	080	P	123	;
038	&	081	Q	124	LT
039	‘	082	R	125	=
040	(	083	S	126	GT
041	)	084	T	127	DEL
042	*	085	U		

VIZA
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