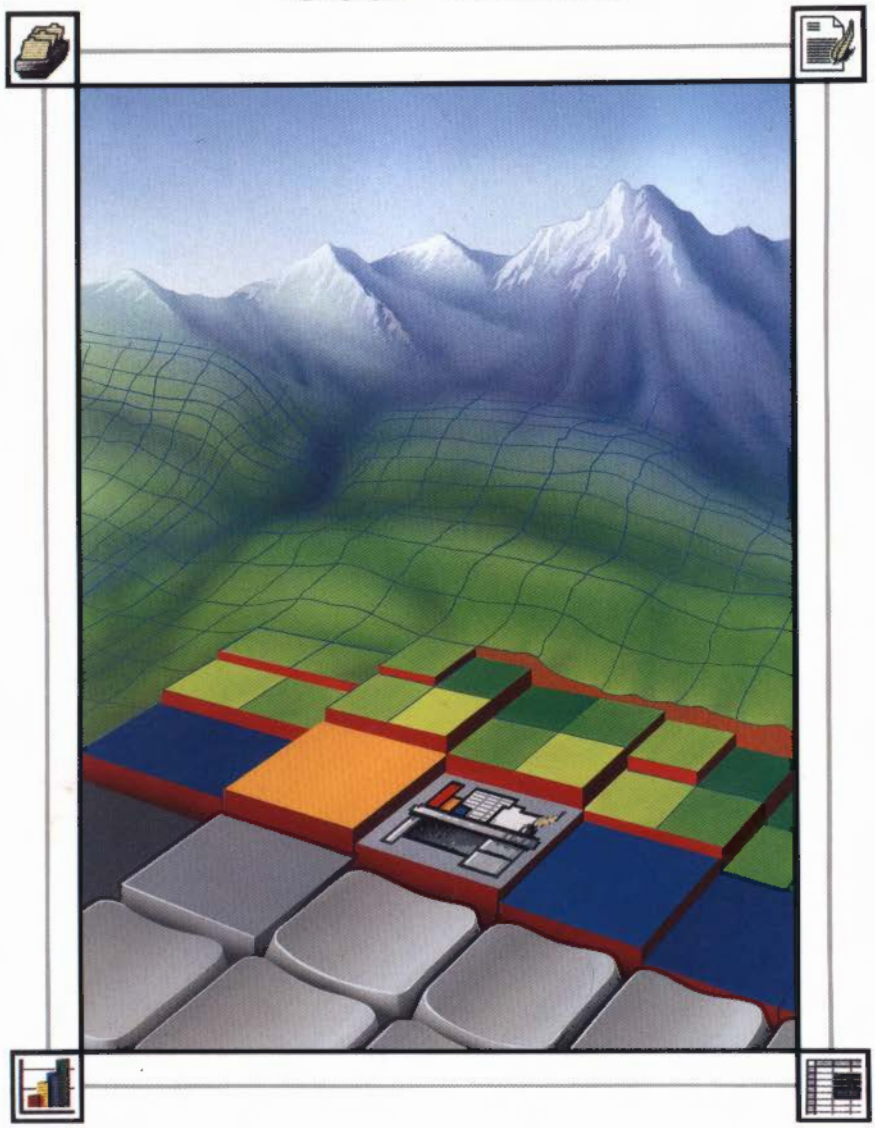
Advance

User Guide



Acorn

Advance

User Guide

Acorn

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Contents

About this Guide

Advance Guides

Advance comes with two manuals – the *Advance User Guide* (this manual) and the *Advance Project Guide*. The *Advance User Guide* teaches you how to use the Advance tools (Word Processor, Spreadsheet, Database and Graph), while the *Advance Project Guide* consists of worked examples of Advance in use. Both show you how Advance provides solutions to real problems.

The Advance User Guide

The *Advance User Guide* is broadly divided into four main parts, describing the Advance Word Processor, Advance Spreadsheet, Advance Database and Advance Graph. These parts are written as tutorials, so you learn by creating your own work as you go, following examples from 'real life' situations. The first three tools have two chapters – *Getting started* and *Learning more*, Advance Graph being covered in a single chapter.

Getting started shows you how to create and edit basic documents quickly; *Learning more* gradually introduces the refinements you'll want to use later on, to speed up your work, and make it look even smarter.

Section headings are structured so that the *Advance User Guide* also serves as a reference to remind you later how to do things.

Advance Word Processor, Spreadsheet, Database and Graph have been designed to work together, and within each part of the Guide there are examples of incorporating information from one application into another. The chapter entitled *Moving data between Advance tools* on page 299 summarises how to use Advance information in different applications, both within Advance, and outside it.

Before you start

This Guide assumes you have used an Archimedes computer with RISC OS 3 before. If you haven't, read the *Welcome Guide* which came with it, to learn how to use the mouse and find your way around the RISC OS desktop.

Conventions used in this Guide

Choosing menu options

Menu options mentioned in the Guide are usually shown in bold font (e.g. **Utilities**). Options available from submenus are shown along with the preceding 'branches' of their menu tree, separated by slashes.

Hence the text "Choose **Effect/Text size/12pt**" means:

1 Display the main menu.

2 Highlight **Effect**, and move the pointer to the right of this option, to display the **Effect** submenu.

3 Highlight **Text size**, and move the pointer to the right, to display the **Text size** submenu.

4 Choose **12pt**.

Tutorial files

As you work through this Guide, you may notice symbols in the margin like the one on the left. Where you see one of these symbols, you can load one of the files provided on the Data discs, either to work on in the tutorial, or to save you time typing in data. The name of the file to load is shown in the paragraph next to the symbol.

Data disc A contains four directories – `WPtutorial`, `SHtutorial`, `DBtutorial` and `GRtutorial` – which contain the files for use respectively with the Word Processor, Spreadsheet, Database and Graph tool chapters of this Guide.

To load one of these files:

1 Insert Data disc A into the floppy disc drive, and click on the floppy drive icon.

2 Double-click on the relevant tutorial directory (e.g. `SHtutorial`).

The file you need will be displayed, so that you can open it or import it into your document, as required.

If you are going to work on one of these files, make a copy of it in your own work directory first, so that you do not overwrite the original.

(Data disc B contains all the files you'll need if you're working through the *Advance Project Guide*.)

1 Overview of Advance

This chapter presents a general overview of Advance and describes its many uses. It also introduces a business venture called Music Matters.

What is Advance?

Advance is an all-in-one software package which contains the most essential tools for a computer in the office, school or home:

- Word Processor
- Spreadsheet
- Database
- Graph.

Advance is an 'open' package – it is easy to share text, graphics and data between the four tools. Furthermore, it is also open to the outside world. So, not only can you write a report with the Word Processor, and include tables from the Database and graphs from the Advance Graph, you can also drop in text from Edit and artwork from Paint and Draw.

The four tools

You can use each of the four Advance tools individually or in combination. A brief description of each tool is given on the following pages.

Advance Word Processor

Advance Word Processor lets you create and edit text documents and include pictures and graphs to illustrate your text. You can use the Word Processor to create many different types of document, from simple letters like the one shown below, to reports, product literature, posters and newsletters:

Advance Spreadsheet

Advance Spreadsheet lets you enter and analyse numbers and create graphs and tables from the data:

Sales at 80% ♦

=AVERAGE(G5)(G11)

G12

	A	B	C	D	E	F	G
1							
2		Sales - by department					
3							
4	Dept.	January	February	March	April	May	June
5	Brass	5650	11400	13650	5350	12800	7750
6	Guitar	5025	7800	7825	11650	6475	7700
7	Keyboard	4200	2600	8000	9450	8250	5300
8	Percussion	2050	3000	2025	3225	750	2600
9	Piano	1890	3080	5830	4640	1890	1350
10	String	5500	4000	1250	4250	1250	7500
11	Woodwind	2220	1580	1390	1100	1960	1190
12	Monthly averages	3790.7142	4625.7142	5652.8571	5666.4285	4767.8571	

You can use Advance Spreadsheet to perform calculations upon any kind of numeric data. The data can either be entered directly, or copied from Advance Database or Word Processor. You can record and analyse statistics, such as project data or sales figures, and manage your accounts.

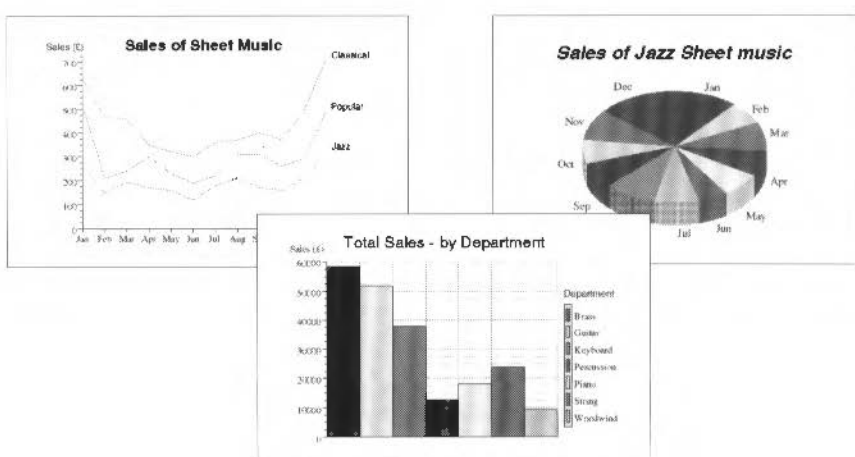
Advance Database

The Database lets you create a database of related information on 'card' records, like the one shown below:

You can store large amounts of information electronically on the Database, search and sort it and produce graphs and reports from it automatically. You can use Advance Database to control stock inventories, to store all types of project data, including pictures, and to create an electronic address book.

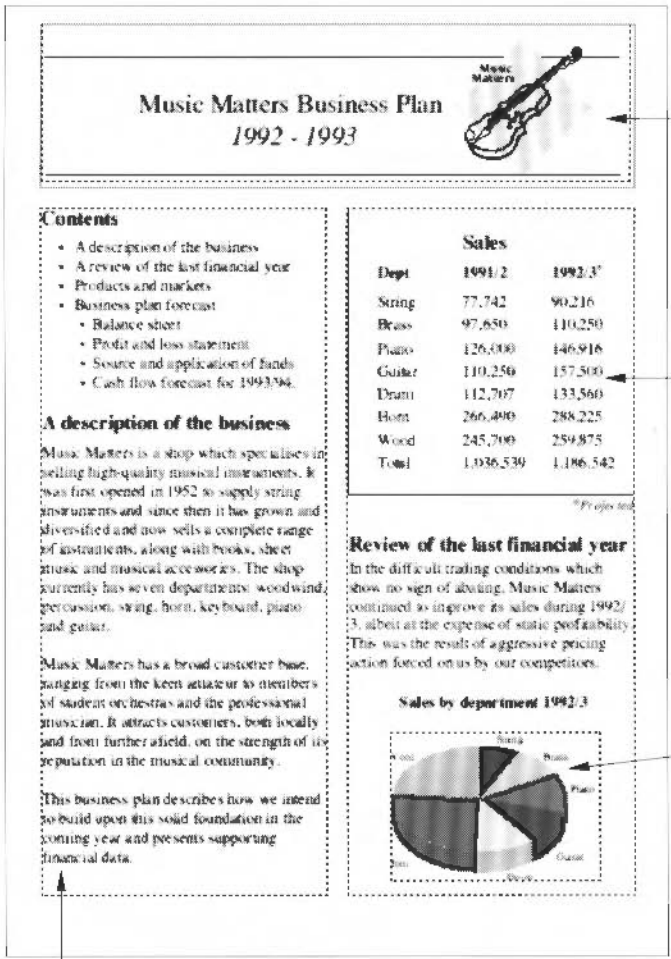
Advance Graph

Advance Graph lets you present numeric information from the Database or Spreadsheet graphically, so that it can be more readily understood. You can create bar charts, pie charts, line graphs and scatter graphs, in both 2-D and 3-D. You can drop these graphs into Advance Word Processor and other RISC OS documents.



An example

The business plan below was created using all four Advance tools. Data stored in the Database was used to produce the pie chart in the Graph tool, and financial information from the Spreadsheet was used to build the table. The business plan itself was created in the Word Processor and the title and company logo were imported from Draw. This illustrates how the four Advance elements can be combined to produce an integrated and informative document.



title and logo imported from Draw

table of financial data from the Spreadsheet

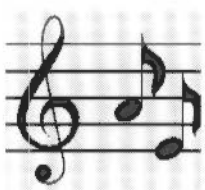
pie chart from the Database

text (and entire document) created using the Word Processor

Advance in practice

However powerful and easy to use Advance may be, its true worth lies in its ability to solve problems and get work done. Accordingly, this Guide teaches you how to use Advance by getting you involved in realistic work examples from an imaginary music shop, which we have named *Music Matters*.

About Music Matters



Music Matters is a shop which specialises in musical instruments. It is a traditional, family-owned business which first opened in 1952 to supply stringed instruments. Since then it has grown and diversified and now sells a complete range of musical instruments along with books, sheet music and musical accessories. The shop currently has seven departments: Brass, Guitar, Keyboard, Percussion, Piano, String and Woodwind.

Music Matters is located on the High Street of Colebridge in Sussex, England and employs 15 people. Its proprietor, Bob Davies, concentrates on marketing and the overall administration of the business. He uses Advance Word Processor to produce sales literature and for his general paperwork. The Financial Manager, Jim Robinson, maintains the accounts and develops the business strategy. He uses Advance Spreadsheet to analyse his financial data. Jane McCluskey is the General Manager; she oversees the day-to-day running of the shop. Jane uses Advance Database to record and collate information.

The staff of *Music Matters* swap information freely between the different Advance applications to create sales and marketing literature, financial forecasts and other business documentation.

2 Installing and running Advance

Installing Advance

For full details of the permitted uses of your Advance product, see the *End User Licence Conditions* printed on the back cover of this Guide (single user pack) or supplied as a separate sheet (site licence). Briefly:

- If you have an **Advance single user pack**, you can install Advance on a hard disc (to minimise disc changing during use) or run it on your computer from floppy discs.
- If you have an **Advance site licence pack**, Advance can be used on all the machines on a site, such as a school. You may also apply to buy further licences which allow you to use Advance cost-effectively off site. If you'd like to use Advance off site, contact your Acorn Authorised Dealer for more information.

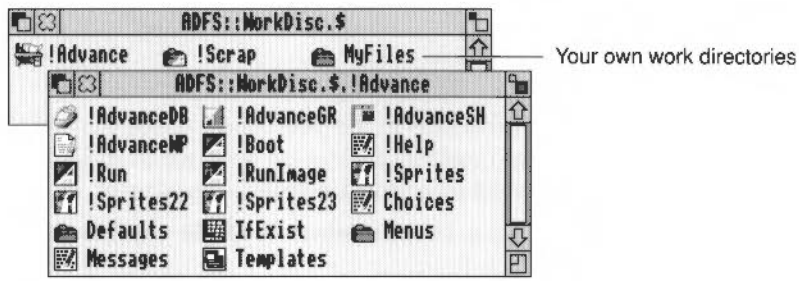
  To use Advance on more than one machine, you can load it from a fileserver, if your site has an Acorn network, from the hard disc of each individual computer ('single' machine), or you could use a combination of these. If you have machines without either hard disc or network connection, you will need to run Advance from floppy discs on these machines.

The following sections explain in turn how to use Advance on floppy discs, a hard disc and a network.

Running Advance from floppy discs

If you are running Advance from floppy discs, make copies (work discs) of all the discs; keep the original discs in a safe place, in case your copies get damaged and you have to make more. See your *Welcome Guide* or the chapter *Discs, networks and filing systems* in the RISC OS 3 *User Guide* for more information about copying discs.

When stored on disc, Advance occupies about 1MB, which is too large to fit on one 800K floppy disc, though it will fit on a 1.6MB ADFS floppy disc. If you have a machine with a disc drive that can read 1.6MB discs, make a single 1.6MB ADFS work disc with a directory structure such as:



Making 1.6MB Advance work discs

Use the following procedure to make work discs:

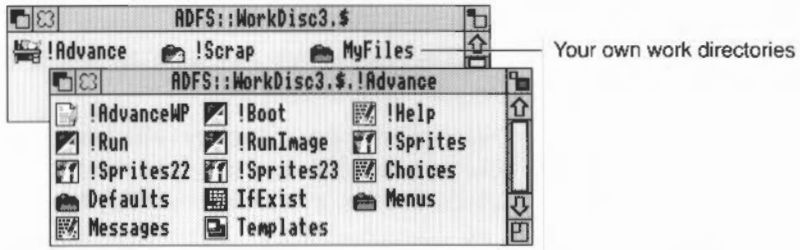
1. Format a blank ADFS 1.6MB format floppy disc, then click on the floppy drive icon on the icon bar to display the root directory of this new work disc.
2. Remove the work disc and replace it with Program disc 1; click again on the floppy disc drive icon to display the root directory of Program disc 1.
3. Drag the !Advance icon into the work disc root directory, then change floppy discs as prompted by your computer.
4. In the work disc root directory, hold down Shift and double-click on the !Advance icon to display the Advance application directory.
5. Remove the work disc, and replace it with Program disc 2. Display the root directory of this disc.
6. Drag the !AdvanceWP icon from the floppy disc to the Advance application directory on your work disc, and again change discs as prompted.
7. Copy `!Scrap` in a similar way from your App1 floppy disc to the root of your work disc.
8. Take backup copies of your work disc for future use, then create further directories on it to hold your own files.

Making 800K Advance work discs

When using 800K work discs, you will need to make a set of work discs each containing only one or two of the Advance applications, in order to leave room for your own files. A sensible set of work discs might be:

Work disc 1	Work disc 2	Work disc 3
!AdvanceDB	!AdvanceGR	!AdvanceWP
!AdvanceGR	!AdvanceSH	

Each work disc should have a !Scrap directory, your choice of Advance applications, and your own files. The disc structure for each work disc should be similar to that shown below (Work disc 3):



Use the following procedure to make each of the three work discs described above:

1. Format a blank ADFS 800K (E) format floppy disc, then back up Program disc 1 onto this blank disc.
2. With your new work disc in your disc drive, click on the floppy disc drive icon on the icon bar to display the work disc root directory.
3. Hold down Shift and double-click on the !Advance icon to display the Advance application directory.
4. Select and delete from the Advance application directory any applications not to be left on the work disc.
5. If you are making Work disc 3, remove the work disc, and replace it with Program disc 2. Display the root directory of this disc. Drag the !AdvanceWP icon from disc 2 to the Advance application directory on your work disc, and change discs as prompted.
6. Copy `!Scrap` in a similar way from your App1 floppy disc to the root of your work disc.
7. Take backup copies of your work disc for future use, then create further directories on it as necessary to hold your own files.

Installing Advance on a hard disc

If you intend to run Advance from a hard disc, follow this procedure for installing it:

1. Create a new directory on your hard disc. You could call this directory `Advance`.
2. Place Program disc 1 in your floppy disc drive; click on the floppy disc drive icon on the icon bar to display the root directory of this disc.
3. Drag the !Advance icon into the new directory you have created on your hard disc.
4. In the hard disc directory display, hold down Shift and double-click on the !Advance icon, to display the Advance application directory.
5. Remove Program disc 1, and replace it with Program disc 2. Display the root directory of this disc.
6. Drag the !AdvanceWP icon from the floppy disc to the Advance application directory on your hard disc.
7. Create another new directory (which you could call `Tutorial`), this time in your Advance directory, and copy the contents of the Data discs into two sub-directories, which you could call `Data_A` and `Data_B`.
8. If it's not already there, copy `!Scrap` from your App1 directory to the root of your hard disc.
9. Remove the floppy disc from the drive. Keep the discs safe, in case you ever need to re-load Advance. You can now run Advance from your hard disc.

Installing Advance on a multi-user fileserver

If you have an Advance site licence pack, and your site has an Acorn network, you can load Advance onto networked machines from a fileserver. Before you start, you should choose which machines will run Advance from a fileserver, and which will be single machines (you can have a mixture). Advance will load most quickly and conveniently from a hard disc, so it may be sensible to install Advance on all your machines with hard discs as single machines; those without hard discs would load Advance from the fileserver.

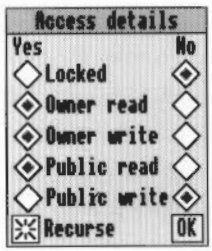
You then need to decide what levels of access you wish fileserver users to have:

- If you'd like all users to use the same central copy of Advance without the freedom to save individual configurations, then follow the instructions under *Installing a central fileserver copy of Advance for multi-user access* on page 11.
- If you'd like to allow different configurations for different groups of users, you'll need to install a central copy of Advance on the fileserver, and a cut-down version of Advance in each user's home directory. This is explained under *Installing a configurable copy of Advance for each network user* on page 12.

Installing a central fileserver copy of Advance for multi-user access

To install a central copy of Advance on a network fileserver:

1. Logon from a network client station (any networked computer **other than** the fileserver) as a System Privileged User, and open the fileserver's root directory.
2. Create a new directory in a publicly accessible area on the fileserver. You'll probably call this directory `Advance`.
3. Place Program disc 1 in your floppy disc drive; click on the floppy disc drive icon on the icon bar to display the root directory of this disc.
4. Drag the !Advance icon into your new directory on the fileserver.
5. In the fileserver directory display, hold down Shift and double-click on the !Advance icon, to display the Advance application directory.
6. Remove Program disc 1, and replace it with Program disc 2. Display the root directory of this disc.
7. Drag the !AdvanceWP icon from the floppy disc to the Advance application directory on the fileserver.
8. Create another new directory (which you could call `Tutorial`), this time in your Advance directory, and copy the contents of the Data discs into two sub-directories, which you could call `Data_A` and `Data_B`.
9. If it's not already there, copy `!Scrap` from your Apps directory to the root of each user's directory. (Do **not** place it in the root of the network.)
10. Remove the floppy disc from the drive. Remember to keep your Advance discs together in a safe place.
11. Once you have installed Advance, you need to set the access details of the fileserver directory. To do this, display the name of the directory on the Desktop and choose **Access** from the Filer menu. Enable **Public read** and **Recurse**, but disable **Public write**, then click **OK**:



You can now run Advance from any machine connected to the fileserver by displaying the directory containing !Advance, and double-clicking on the !Advance application.

This multi-user central network copy of Advance is read-only, and so user attempts to save either **Choices** options or default documents will fail with an error such as `Insufficient access`. In order to maintain a standard configuration for all users, you may wish in any case to remove these options from the menus. For information on how to achieve this, see *Appendix C: Configuring menu options* on page 309.

To allow a particular network user to save **Choices** or **Save as default**, you should install a cut-down copy of Advance in their user directory on the fileserver. This is explained below.

Installing a configurable copy of Advance for each network user

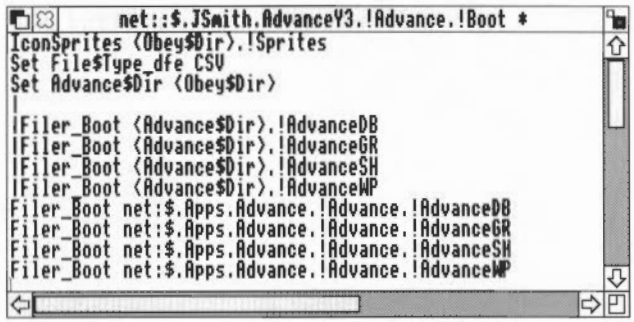
You can set up Advance to allow a variety of different configurations for different users. For example, you may wish to allow pupils in Year 3 access to Advance Word Processor alone, and pupils in Year 4 access to Advance Word Processor and Advance Spreadsheet.

To do this, you install a single central copy of Advance on the network fileserver (as explained under *Installing a central fileserver copy of Advance for multi-user access* on page 11), and a cut-down version of Advance (known as the Advance shell) in each user's home directory. This cut-down version is known as the Advance shell, and occupies about 64KB.

You may create several different versions of the Advance shell to suit your needs.

1. Follow the instructions under *Installing a central fileserver copy of Advance for multi-user access* on page 11 to install a central copy of Advance on the network fileserver.
2. Create a new directory in a user's directory. If, for example, you are setting up an Advance shell for Year 3 pupils, you could call this directory `AdvanceY3`.
3. Display the fileserver directory containing the central network copy of Advance, and drag the !Advance icon into the directory you have just created.
4. In the user's directory display, hold down Shift and double-click on the !Advance icon, to display the Advance application directory.
5. Delete !AdvanceDB, !AdvanceGR, !AdvanceSH and !AdvanceWP from the user's Advance application directory.
6. Now edit the user's !Boot file. Disable access to any applications by editing the appropriate line(s) to be a comment, and add appropriate Filer_Boot lines to point to the central network fileserver copy of Advance.

To avoid mis-typing the pathname, type in `Filer_Boot` followed by a space. Then hold down Shift, and double-click on the central copy of Advance. You can now drag each of the applications you require into the !Boot file window to insert the pathname automatically:



7 Save and close the !Boot file, and close the Advance application directory.

You can now copy the new directory containing the Advance shell to the home directory of all appropriate users. You may also wish to keep a central copy of this directory (and any other Advance shell directories) for future use.

To run Advance from any machine connected to the fileserver, display a user directory containing the Advance shell, and double-click on !Advance.

Installing Advance on read-only filing systems

If you use a read-only network filing system such as Application Accelerator or AppFS, or any similar read-only filing system, and you have a network fileserver, you could place your central fileserver copy of Advance in the read-only filing system, and a separate Advance shell in a user area of a writable network filing system (such as a user home directory on a Level 4 fileserver, etc). Otherwise, the Advance shell could be placed on a local dedicated writable media connected to the computer (for example, an ADFS hard or floppy disc).

To do this, you need to create a modified master copy of the Advance shell on a floppy disc:

1 Format a blank ADFS 800K (E) format floppy disc, then back up Program disc 1 onto this blank disc.

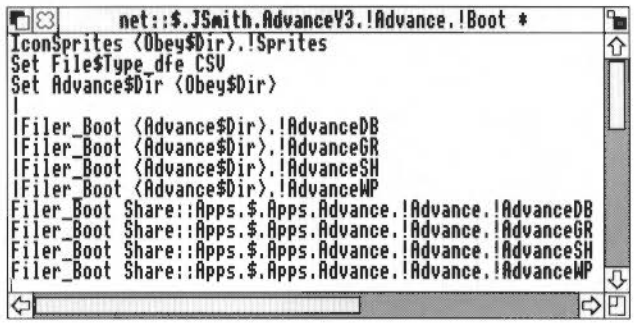
2 With the backup disc in your disc drive, click on the floppy disc drive icon on the icon bar to display the backup disc root directory.

3 Hold down Shift and double-click on the !Advance icon to display the Advance application directory.

4 Delete !AdvanceDB, !AdvanceGR and !AdvanceSH from the Advance application directory.

5 Now edit the user's !Boot file. Disable access to any applications by editing the appropriate line(s) to be a comment, and add appropriate Filer_Boot lines.

To avoid mis-typing the pathname, type in `Filer_Boot` followed by a space. Then hold down Shift, and double-click on the central copy of Advance. You can now drag each of the applications you require into the !Boot file window to insert the pathname automatically:



6 Save and close the !Boot file, and close the Advance application directory.

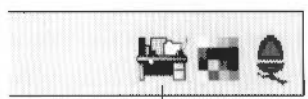
7 Remove the disc, and label it 'Modified Advance Shell Master Disc'.

You can now copy the modified Advance shell to appropriate locations.

Running Advance

Before running Advance, open a directory display containing !Scrap, so that it has been 'seen' by RISC OS. If you are running Advance from a hard or floppy disc, place !Scrap in the disc root directory. If your system has not seen a copy of !Scrap, Advance may produce an error such as `Not found` when you try to save a file from one tool to another, produce a graph from the Database, or print. Note that if you are running from floppy discs, whenever you change discs, you should double-click on the `!Scrap` file of the current disc. This reduces the number of times you'll need to swap discs.

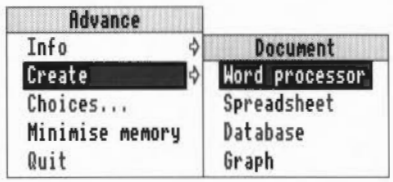
To load Advance, open the directory display containing the !Advance icon, on your floppy work disc, hard disc or network fileserver, then double-click on it. The Advance icon will appear on the icon bar:



Advance icon

Opening a new Advance document

To load any Advance tool, press Menu over the Advance icon bar icon, and choose the tool you want from the **Create** submenu.



A blank document for that tool will be opened on the desktop.

If you just click on the Advance icon on the icon bar, a blank Advance Word Processor document will be displayed.

Loading an existing Advance file

As with most RISC OS applications, when you double-click on an Advance file, what happens next depends on whether or not the computer knows where to find Advance in order to load it.

If you are already using Advance, or have been since you last switched off or reset the computer, or if the Advance program icon has ever been displayed on the screen during this time, the computer knows where to find Advance. When you double-click on the file icon, Advance will be loaded onto the icon bar (if it is not already there), and your file will be opened.

If you haven't used Advance since you last switched off or reset the computer, and if the Advance program icon has never been displayed on the screen during this time, you'll need to load Advance, or open a directory display containing the !Advance icon, before double-clicking on your file icon to open the file.

If you have a hard disc, you can tell the computer how to find Advance automatically, by saving a Desktop boot file once the computer has displayed the Advance icon. This way, you won't have to load Advance separately. See the RISC OS 3 *User Guide* for more information about Desktop boot files.

If you want to open an Advance Database file

If you open a write-protected Advance Database file, all options which alter the structure of that Database file are disabled. In the case of a write-protected Database file which contains no records, the file simply does not open because Edit mode is disabled. Any Advance Database file on a floppy disc which has the write-protect tab set is a write-protected file.

Remember, you should always make copies of master discs for normal use.

Advance icon bar menu options

If you press Menu over the Advance icon on the icon bar the following menu will appear:

Info leads to a dialogue box containing details about the version of Advance.

Create leads to a submenu allowing you to create new Advance Word Processor, Spreadsheet, Database or Graph documents (see *Opening a new Advance document* on page 15).

Choices leads to a dialogue box allowing you to set new defaults for the Word Processor and Spreadsheet. See *Customising your environment* on page 83.

Minimise memory is provided for machines with limited memory. Clicking on it will cause Advance to remove from memory any tools no longer in use. For details on how best to manage your computer's memory, see *Appendix B: Using Advance on 1MB or 2MB computers* on page 303.

Quit ends your Advance session; if you have not saved any of your files, Advance will prompt you to save them first.

Using Advance on a 1MB computer

The more memory your computer has, the more versatile Advance becomes. When you using Advance on a 1MB computer, there are a few things to remember:

- You can only use **one** of the Advance tools – Word Processor, Spreadsheet, Database or Graph tool – at a time. On a 2MB computer you can usually run two at once.
- You cannot plot graphs **directly** from the Spreadsheet or Database; you must save your data to disc first, then import it into Graph.
- You may not be able to load some very large files, such as large databases containing many pictures.
- You may not be able to use the Spelling checker in the Word Processor.
- You will not be able to step though all the worked examples in this and the accompanying *Project Guide*.

For more detailed advice about how to make best use of Advance on a 1MB or 2MB computer, see *Appendix B: Using Advance on 1MB or 2MB computers* on page 303.

3 Introducing the Word Processor

Advance Word Processor helps you to produce professional-looking documents and publications and lets you present your information in a clear and structured way.

What is a word processor?

A word processor is a piece of software primarily designed for writing and editing documents on the screen of your computer. Word processors are closely related to Desktop Publishing (DTP) programs, but the latter are mainly intended for producing short documents with complex page layouts, and often have difficulty handling longer documents.

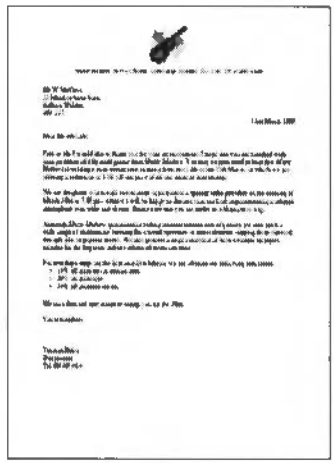
Advance Word Processor has many of the best features of both worlds – you can not only write and edit long documents, but also incorporate complex design elements often associated with DTP software, such as fonts, multi-column layouts and imported graphics.

You can create a variety of documents with Advance Word Processor, such as letters, leaflets, newsletters and reports. You can also add graphics from Draw and Paint (including scanned images), charts from Advance Graph, tables from Advance Spreadsheet and data from Advance Database.

Some examples

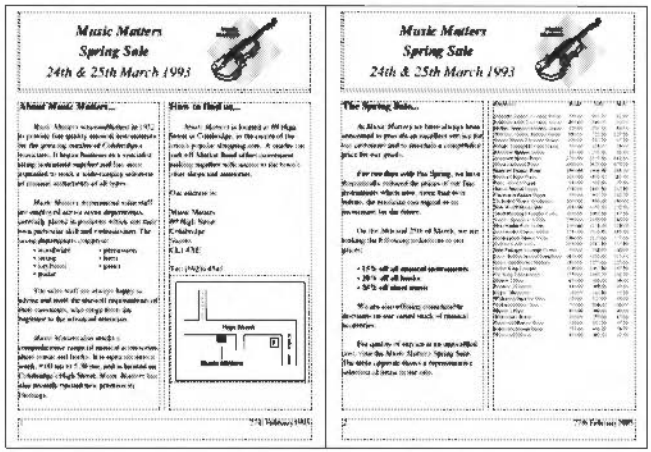
The following documents were created using Advance Word Processor. They show the range of documents that you can produce using this tool. In the next two chapters you will find step-by-step instructions on how to create the letter and leaflet.

memo

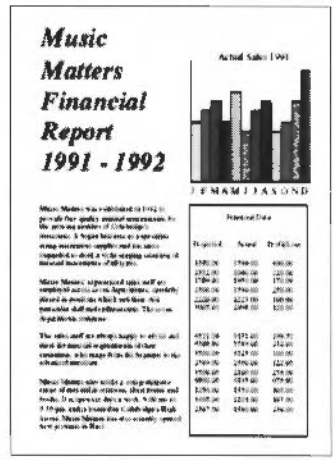


letter

newsletter



leaflet



report

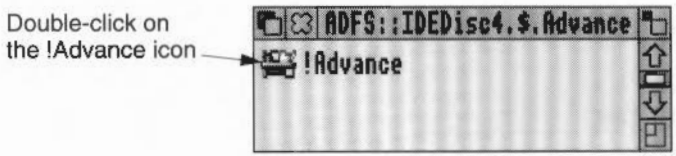
4 Getting started with the Word Processor

This chapter is an introduction to the basic features of Advance Word Processor. It tells you how to load a document, change its layout, edit text and alter its appearance. It describes how to save and print a document, to create document templates and finally how to quit the Word Processor.

Loading Advance

First make sure Advance has been installed as described in the chapter *Installing and running Advance* on page 7.

To start using Advance, display the directory containing the !Advance icon on the screen and then double-click on the Advance icon. This loads Advance onto the icon bar ready for use.



Starting off with a blank sheet of paper

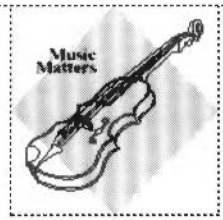
To create a new, blank Word Processor document, see *Creating a new document* on page 46.

In this chapter, as an introduction to the Word Processor, we are going to look at an **existing** document, and make changes to it.

Opening an existing document

If you want to open an existing Advance document, you do not normally need to load Advance specifically in the way described in *Loading Advance* on page 19 – it is enough that the !Advance icon is (or has been in the current session) displayed on the desktop, so that the computer knows where to find Advance when you want to open an Advance file.

As an example, open the document called `Letter` in the `WPtutorial` directory of Advance Data disc A. You will see the following document on your screen (click on the toggle size icon to display the letter across your screen):



Music Matters 89 High Street Colebridge Sussex CL1 4XE Tel (0923) 4545

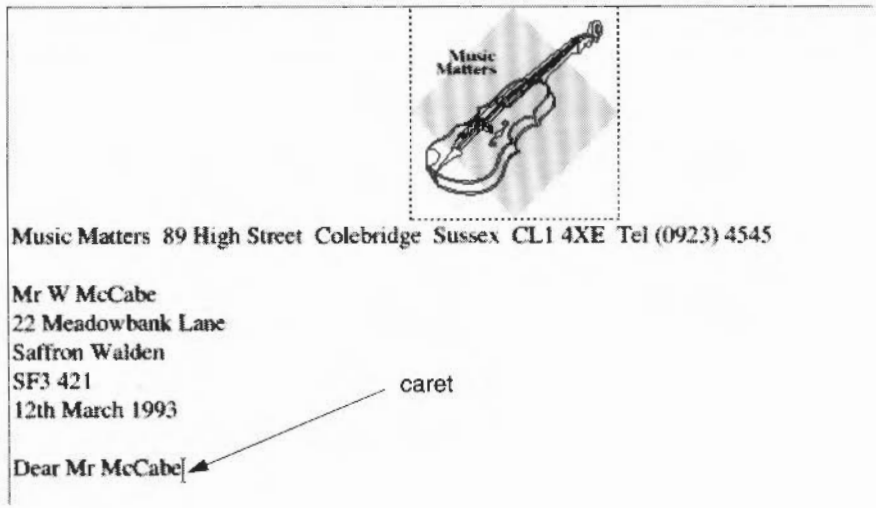
Mr W McCabe
22 Meadowbank Lane
Saffron Walden
SF3 421
12th March 1993

Dear Mr McCabe

First of all, I would like to thank you for your recent custom. I hope that you are satisfied with your purchase from Music Matters. You may be interested to hear that Music Matters is holding a mid-season sale, running from the 24th to the 27th March, in which we are offering a reduction of 15% off the price of all our musical instruments.

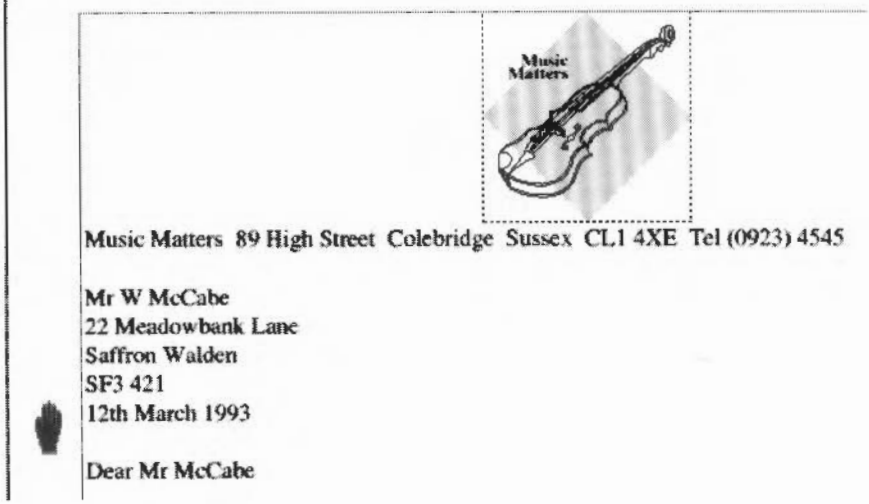
This is a letter from Bob Davies, who is the proprietor of Music Matters, the music company we mentioned in *About Music Matters* on page 5. It is the first draft of a letter he has written to a customer, telling him about a future sales promotion.

Click somewhere on a line of text in the open document. You will notice a small red flashing vertical bar at a point in the text near to where you clicked. This is called the caret; you place it where you want to type some text.



Moving around the document

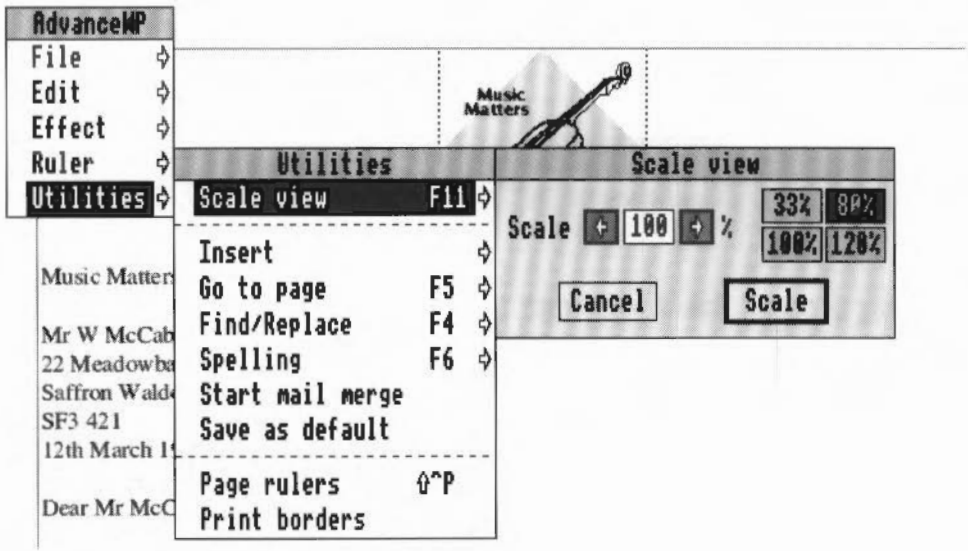
To see the entire letter, use the window scroll arrows to move around the text. Alternatively, move the pointer anywhere over the document outside of the text frame (the area of text bordered by the green line), and it will change into a hand. Use this hand to drag the document around.



Scaling the view

Bob has just finished writing this letter. It is too big for him to see much of it at a time on the screen, so he wants to reduce the size of the letter. He uses the **Scale view** option which lets him zoom in and out. This doesn't change the size the letter will be printed – just how large it appears on the screen.

Bob clicks Menu over the document. From the Advance Word Processor main menu he moves to the **Utilities** sub-menu and displays the **Scale view** dialogue box. (This process is usually described in this Guide as 'choosing the **Utilities/Scale view** menu option'.)



The dialogue box shows that the current scaling factor is 100%. Bob chooses **33%** and then clicks on the **Scale** button to confirm the change.

This reduces the size of the letter so that more of it appears in the window:

Although he can see all the letter, the text is now too small to read. He'll need to increase the scaling factor to improve its legibility, so he tries again, this time choosing 80%. This gives a good compromise between legibility and being able to see as much of the document as possible without scrolling.

Text editing

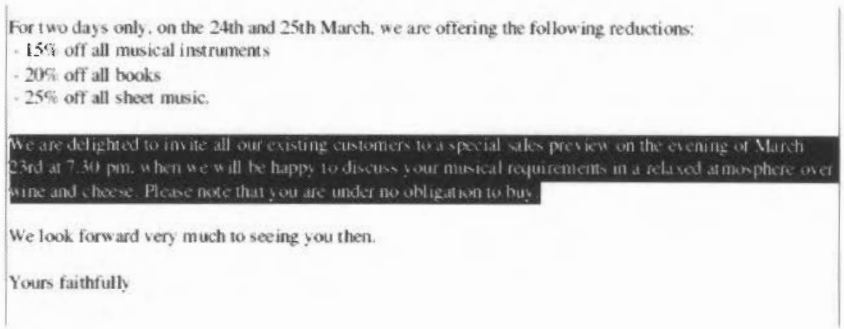
Bob isn't satisfied with the layout of his letter. He wants to move a paragraph nearer the beginning of the letter, and make a few other changes.

Moving text around usually involves three stages:

1. **selecting** the text.
2. **cutting** the text to the clipboard (an area of computer memory), or **copying** it to the clipboard, so that the original text stays where it is.
3. **pasting** the text into the document from the clipboard to the new position (or just leaving it on the clipboard if it isn't needed elsewhere).

Selecting text

He selects the paragraph which invites the customer to the sales preview ('We are delighted to...'), by putting the caret at the start of the paragraph, holding down Select and dragging the caret down to the end of the paragraph. The selected text is highlighted:


For two days only, on the 24th and 25th March, we are offering the following reductions:
- 15% off all musical instruments
- 20% off all books
- 25% off all sheet music.

We are delighted to invite all our existing customers to a special sales preview on the evening of March 23rd at 7.30 pm, when we will be happy to discuss your musical requirements in a relaxed atmosphere over wine and cheese. Please note that you are under no obligation to buy.

We look forward very much to seeing you then.

Yours faithfully

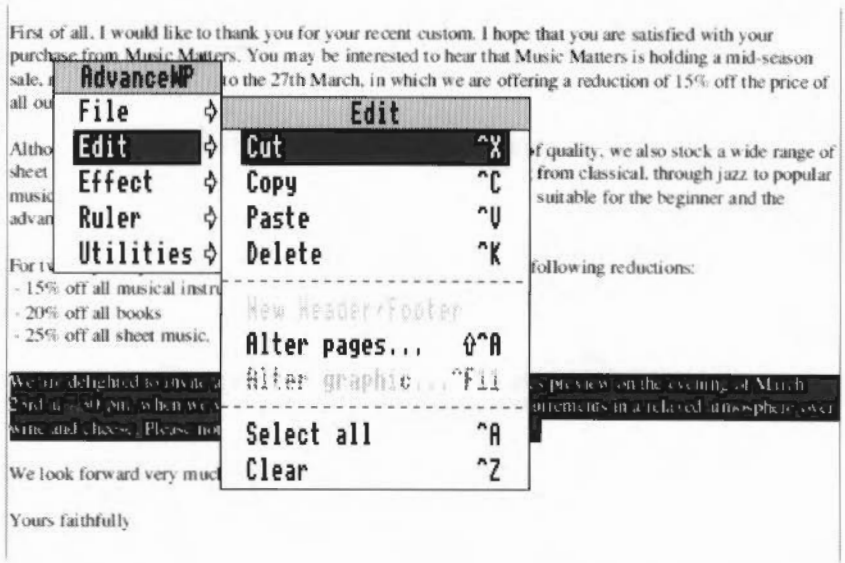
There are other ways of selecting text blocks, and these are summarised in the following table:

To select	Action
Word	Double-click on the word
Line	Triple-click on the line
Paragraph	Click at the start of the paragraph, then drag to the end. or Click at the start of the paragraph, then click Adjust at the end.
All the text in a document	Choose **Edit/Select all**
To deselect	Click anywhere in the text frame

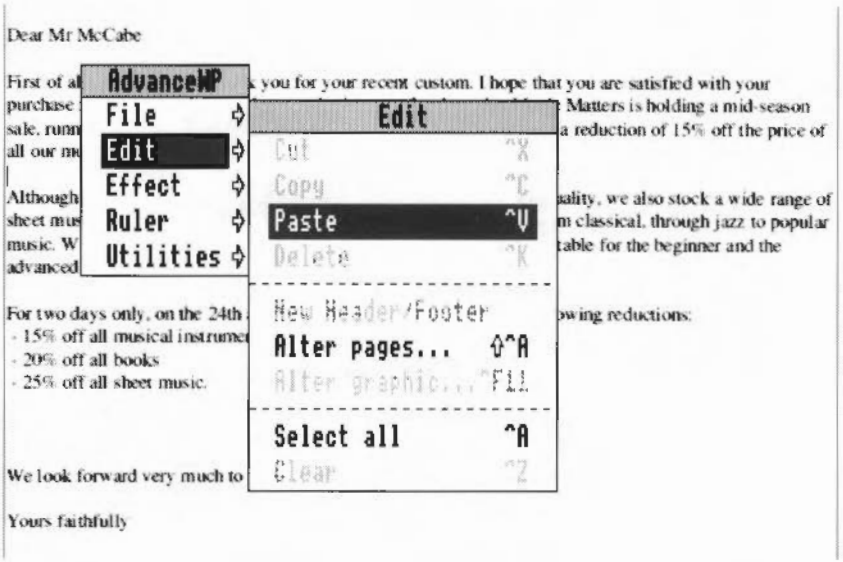
See also the appendix entitled *Keyboard short-cuts* on page 319 for quick ways to select text.

Cutting and pasting

To move the paragraph, Bob chooses **Edit/Cut**. This deletes the selected text, but leaves a copy of it on the clipboard. You paste this copy in a new place to complete the move.



He clicks on the blank line at the end of the first paragraph, where he wants the text to appear, then chooses **Edit/Paste**. The text is pasted from the clipboard to its new position.



Warning: If you accidentally touch a key when text is selected, the selected text is automatically placed on the clipboard; you can get it back by choosing **Edit/Paste**.

He presses Return to add an extra blank line at the end of the paragraph, then adds an extra blank line to the start of the paragraph. His letter now looks like this:

Mr W McCabe
22 Meadowbank Lane
Saffron Walden
SF3 421
12th March 1993

Dear Mr McCabe

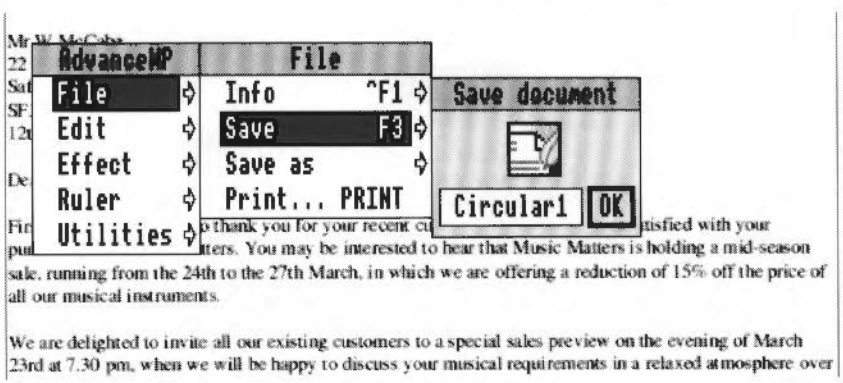
First of all, I would like to thank you for your recent custom. I hope that you are satisfied with your purchase from Music Matters. You may be interested to hear that Music Matters is holding a mid-season sale, running from the 24th to the 27th March, in which we are offering a reduction of 15% off the price of all our musical instruments.

We are delighted to invite all our existing customers to a special sales preview on the evening of March 23rd at 7.30 pm, when we will be happy to discuss your musical requirements in a relaxed atmosphere over wine and cheese. Please note that you are under no obligation to buy.

Although Music Matters specialises in selling musical instruments of quality, we also stock a wide range of sheet music catering for a broad spectrum of musical tastes, ranging from classical, through jazz to popular music. We also possess a large collection of books written on topics suitable for the beginner and the advanced musician alike.

Saving a document

Bob wants to save his reformatted letter, so he chooses the **File/Save** option:



He types the filename he has chosen for his letter, **Circular1**, and drags the file icon to his work directory.

If you want to catch up with Bob's progress, load the file `LetterA` from the `WPtutorial` directory on Data disc A.

Deleting Text

Scrolling through the letter, Bob notices that the cut and paste operation has left a large gap before the final paragraph, caused by surplus Return characters. He selects these extra lines and deletes them, by choosing **Edit/Delete**. Like **Cut**, **Delete** deletes the selection, but does **not** leave a copy on the clipboard, so you are asked to confirm you really do want to delete the selection.

Copying and pasting

Bob thinks it would be a good idea to repeat Music Matters' telephone number at the end of the letter. Instead of typing it out again, he decides to copy the number from the top of the letter and paste the copy into the document below his signature.

To do this, he first selects the telephone number at the end of Music Matters' address, then chooses **Edit/Copy**. The words remain in the document in their original place, but a copy is stored on the clipboard.

He moves the pointer to the very end of the letter and clicks after the last word '(Proprietor)'. He presses Return once, to move the caret to the line below his title, and then chooses **Edit/Paste** to drop the telephone number into the document at this point.

Typing text

Bob next decides to add a personal touch to the letter. He checks the Music Matters computer database and discovers that Mr McCabe bought a Spanish guitar just before Christmas. He will mention this in the letter.

He clicks after the word 'purchase', to move the caret where he wants it, then types in 'of a Spanish guitar'. He stumbles over the spelling of 'guitar' in the process, but uses Delete to erase his mistake.

Bob also replaces the word 'then' in the last paragraph with the words 'on the 23rd', by selecting the word, then just typing over it; the original text is deleted.

For two days only, on the 24th and 25th March, we are offering the following reductions:
- 15% off all musical instruments
- 20% off all books
- 25% off all sheet music.

We look forward very much to seeing you then.

Yours faithfully

He saves his letter again. If you want to catch up with Bob, open the file `LetterB` from the `WPtutorial` directory on Data disc A.

Changing the appearance of the text

The contents are now fixed but Bob feels that the letter is lacking something. He decides to experiment with the appearance of the text, using the **Effect** menu option.

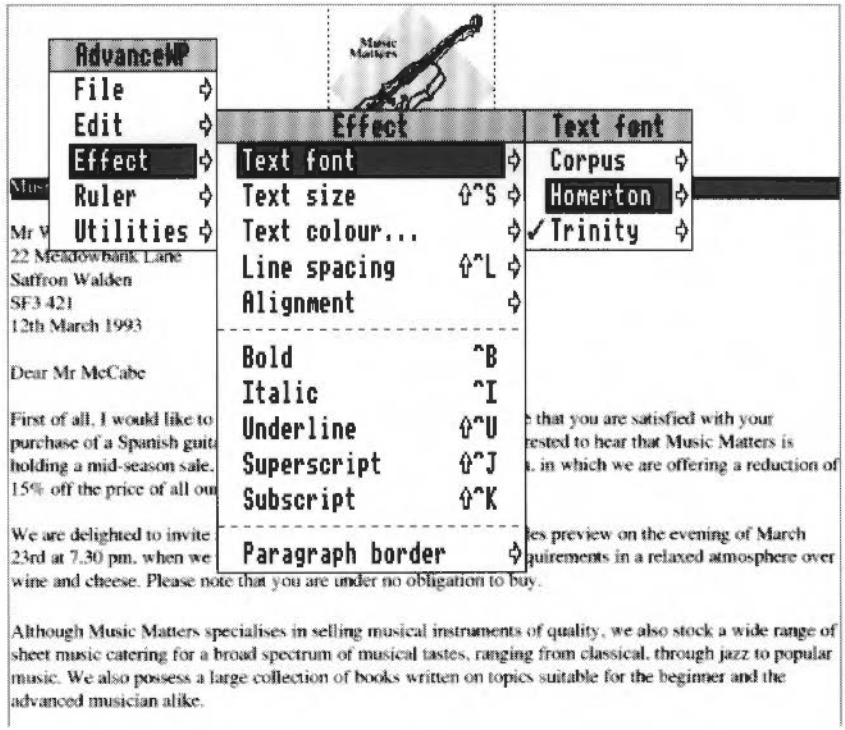
On start-up, the appearance of an Advance Word Processor document is determined by the default document (more of this later, in *Creating a new default document* on page 41), but you can change the layout and the fonts it uses as you go.

Changing the text font

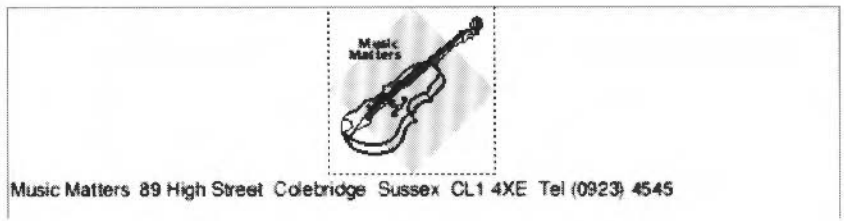
To emphasize Music Matters' address at the top of the letter, Bob decides to change its text font. The font (sometimes known as the typeface) defines a regular appearance for the text. The text of this manual is written in the Novarese font, for example.

To change its font, he selects the line containing the address by triple-clicking on it, then goes to the **Effect/Text font** sub-menu. A list of the fonts that are available is displayed there.

Bob chooses the font called **Homerton**.



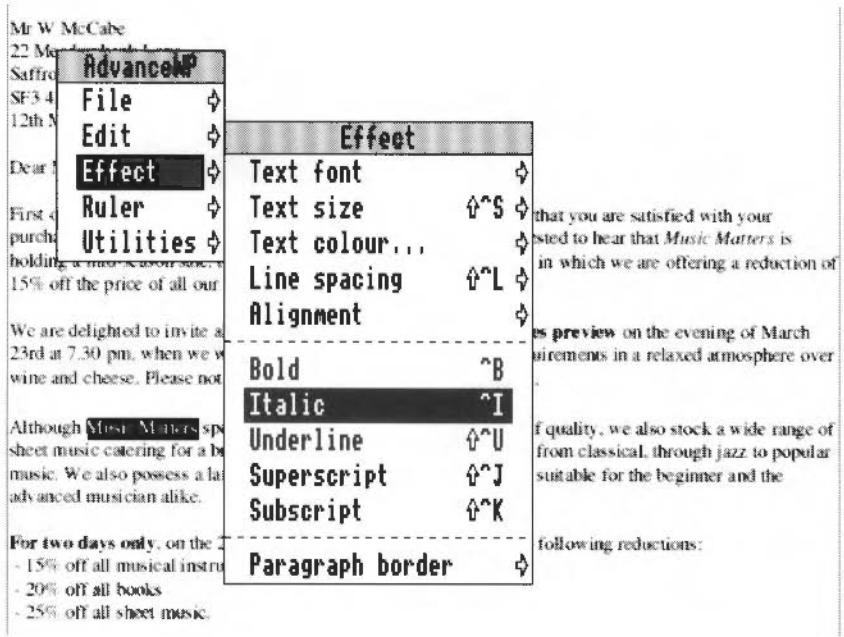
The font change takes immediate effect, and the address should now look like this:



Bob wants to bring the words 'special sales preview' in the second paragraph and 'two days only' in the fourth paragraph to the customer's attention by using a bold font.

So, he selects the words, then chooses **Bold** from the **Effect** menu. Alternatively, he could have typed Ctrl-B.

He also selects all instances of the company name, 'Music Matters', except in the address at the top, and changes the font style using **Italic** from the same menu (or he could have typed Ctrl-I).



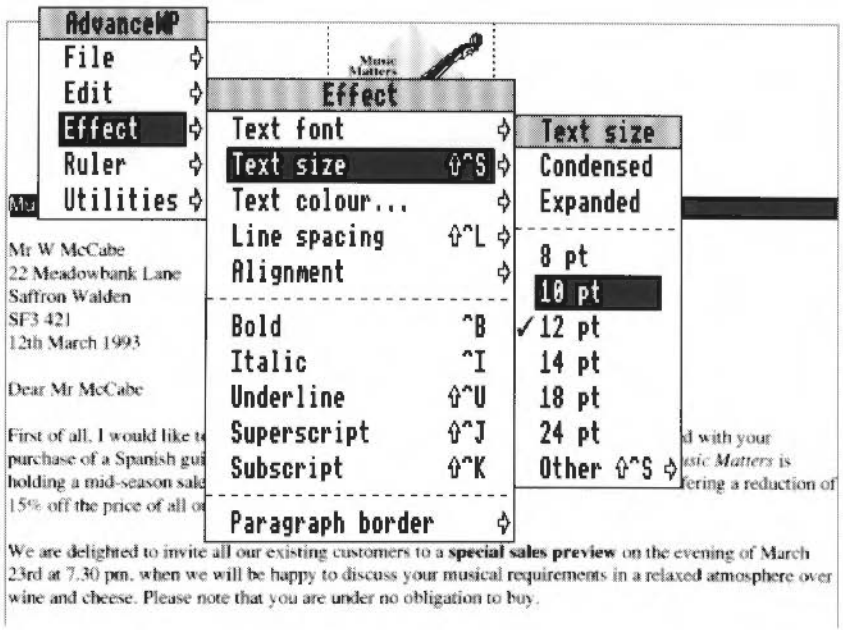
Bob has changed the typeface (Homerton) and the style (Bold, Italic) of some of the text in his letter. He is now going to change the **size** of the text, but before he does, he saves his letter again.

To catch up with Bob, load the file `LetterC` from the `WPtutorial` directory on Data disc A.

Changing the text size

The **Text size** determines the height and width of the characters and is measured in points (pt). (There are 72 points to an inch, or about 28 to a centimetre.)

Bob changes the size of the company address to 10pt, by selecting the address line, then choosing **Effect/Text size/10pt**.



Changing the alignment

The alignment, or 'justification' of the text determines how the words are positioned on a line. By default, the text is left-aligned – sometimes known as 'ragged-right'. In Advance Word Processor, a paragraph of text can be

- **left-aligned**:

Around the rugged rocks the ragged rascals ran their rural races

- **right-aligned**:

Around the rugged rocks the ragged rascals ran their rural races

- **centred**:

Around the rugged rocks the ragged rascals ran their rural races

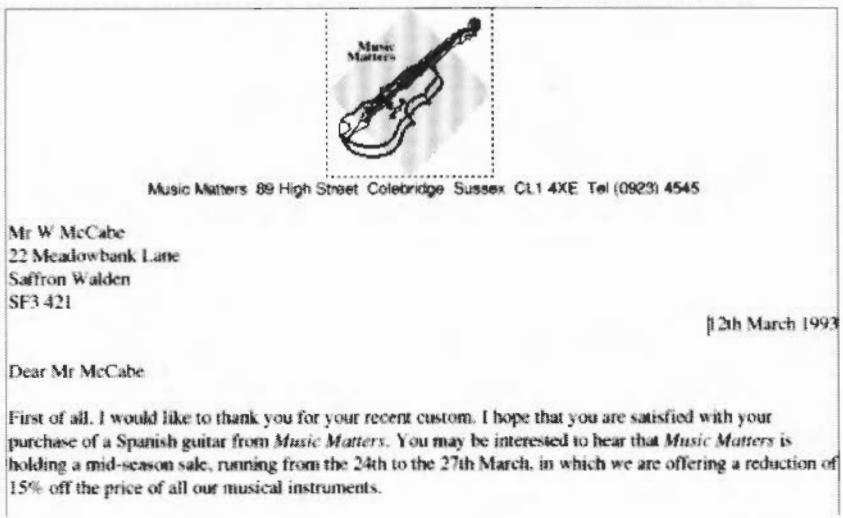
- **fully-justified**:

Around the rugged rocks the ragged rascals ran their rural races

To make it more symmetrical, Bob centres the company address at the top of the page and then aligns the date to the righthand margin of the letter.

To centre the address, he selects it and chooses **Effect/Alignment/Centre**.

To move the date over to the right, he selects the date and chooses **Effect/Alignment/Right align**. The letter now has a more professional appearance:

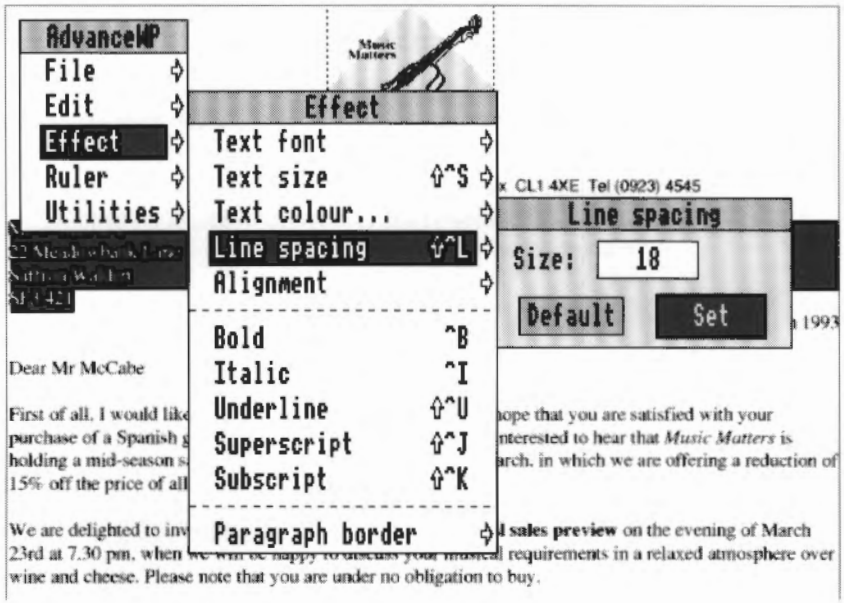


Note that you can also set a line or paragraph to be left-justified (the default) or fully-justified (both left- and right-justified) from the Effect menu in the same way.

Changing the line spacing

Advance Word Processor automatically sets the line spacing (the space between lines of text) when you change the size of a font, to suit the new size. Traditionally, line spacing is set to be 120% of the font size, so the line spacing used by default here with 12pt text is 14.4pt. Bob would like to increase the spacing of the customer's address at the top of the letter. He selects the address and chooses the **Effect/Line spacing** menu option. This option displays the line spacing box, where

the current spacing in points is shown. To increase the line spacing by 25%, he deletes the current number (using Delete on the keyboard), and types `18` (18 is 14.4 plus 25%) in the box, clicking on **Set** to confirm the change.



He saves his work before going on to improve the layout of his letter.

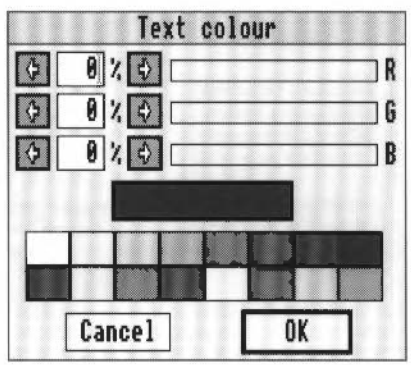
If you want to catch up to where Bob is with his letter, load the file `LetterD` from the `WPtutorial` directory on Data disc A.

Other text options

There are also other options on the **Effect** menu which Bob could have used to change the appearance of selected text. These options are:

- **Text colour...**
- **Underline**
- **Superscript**
- **Subscript**
- **Paragraph border.**

The **Text colour** option is used to change the colour of the text in a document (this option is most useful if you have a colour printer). Selecting **Text colour** displays the text colour dialogue box which gives you the choice of changing the colour by clicking on a colour on the 16-colour palette or by dragging the Red, Green and Blue (RGB) colour bars to specify a colour created from a combination of these three colours.



The **Underline** option is used to underline a selected word or group of words in a document:

These words are underlined

The **Superscript** option is used to create text as a superscript, for example:

This is a ^{super}script

The **Subscript** option is used to create text as subscript, for example:

This is a $_{sub}$script

Superscript and subscript can be used together to produce fractions, such as $^{3}/_{32}$; the more common fractions can be entered from !Chars (a RISC OS 3 ROM application).

Paragraph border leads to a sub-menu, from which you can select:

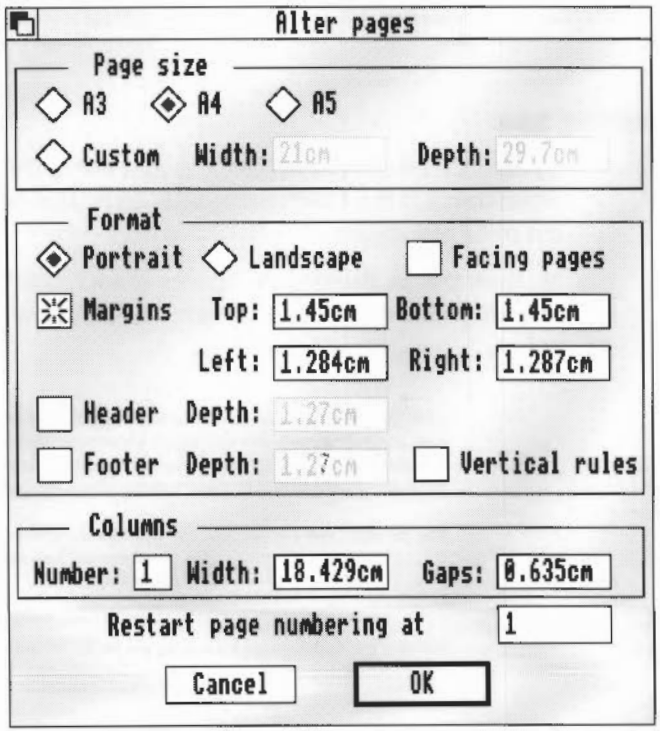
- **Thick** and **Thin** borders to the paragraph (i.e. a box around the paragraph), or a box with a drop **Shadow**.
- **Thick** and **Thin rule**s – a line under (and as wide as) the paragraph selected.

Defining margins and tabs

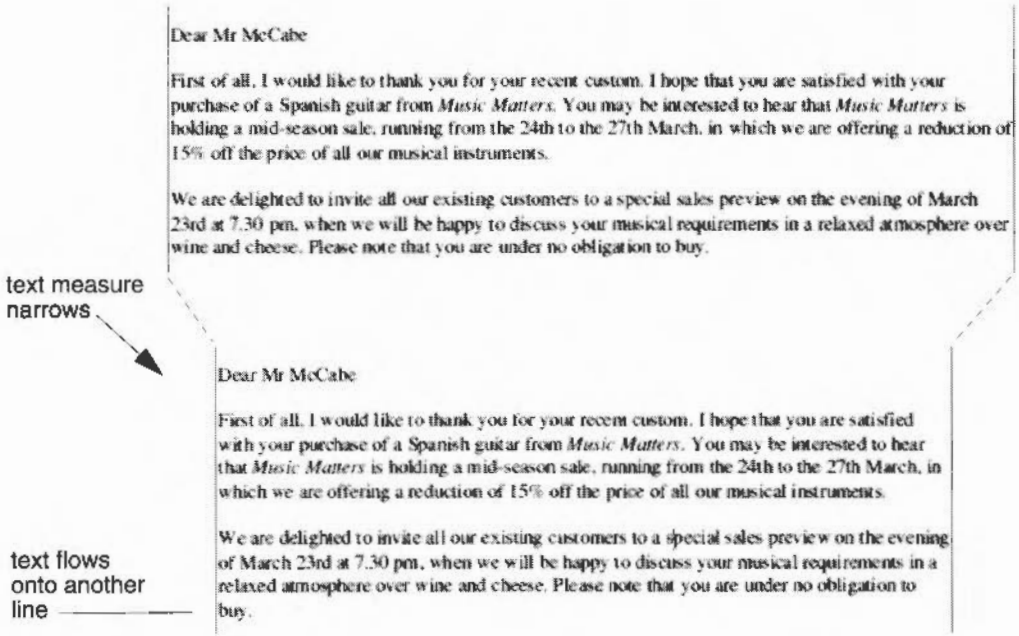
Defining margins for the whole document

Meanwhile, back at Music Matters, Bob is continuing to refine his letter. This time he wants to increase the size of the left and right margins, to make the layout look less cramped.

To do this, he clicks inside the text frame and then chooses **Edit/Alter pages**; this displays the **Alter pages** dialogue box:



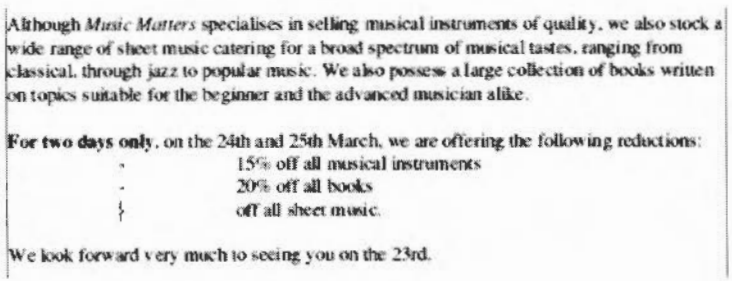
He enters the value **2.5** cm in the **Left** and **Right Margins** boxes and clicks on **OK**. The margins increase and the text measure narrows:



Setting tabs

By nature a bit of a perfectionist, Bob is not quite happy with the appearance of the listed items in the fourth paragraph, so he decides to indent them to emphasize the price reductions.

He does this by deleting the spaces at each side of the dash characters and inserting a tab in the place of each one by pressing the Tab key. The result is shown below.

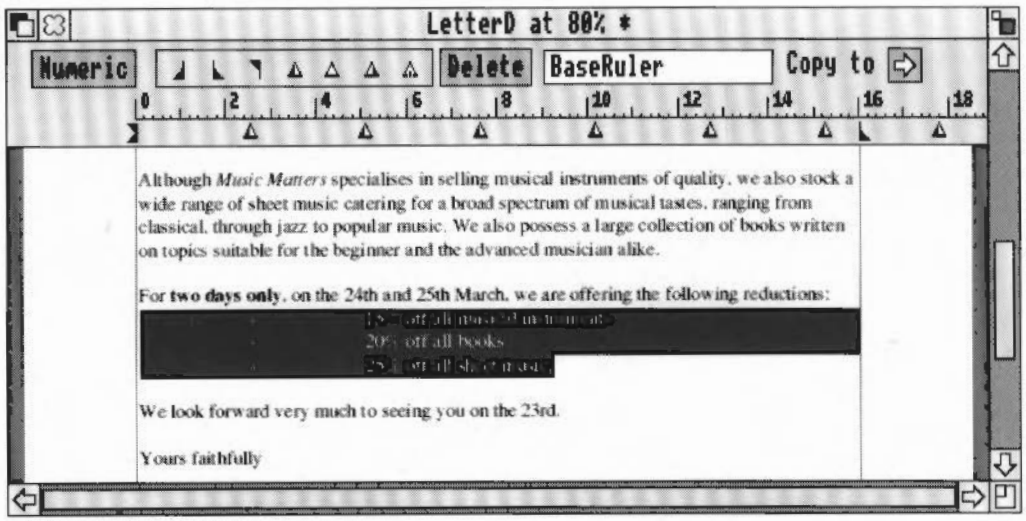


Clearly, the default tab settings are too wide for the list, so he changes them using the rulers feature of the Advance Word Processor.

About rulers

Tabs and paragraph indents are controlled from the ruler, so to change the tabs Bob will edit the ruler which applies to the area selected.

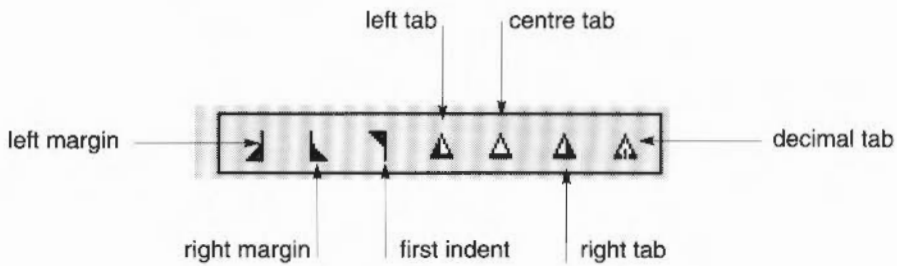
He selects the sentences containing the listed items and chooses the **Show ruler** option from the main menu. The ruler is displayed at the top of the window:



Rulers can apply to the whole document, just to a single paragraph, or to any number of paragraphs in between. At present, the whole document is covered by the base ruler, which is the one displayed. As we mentioned before, rulers control the positions of margins and tabs, so the whole letter (as well as the area selected) has the margins and tabs you can see on the ruler.

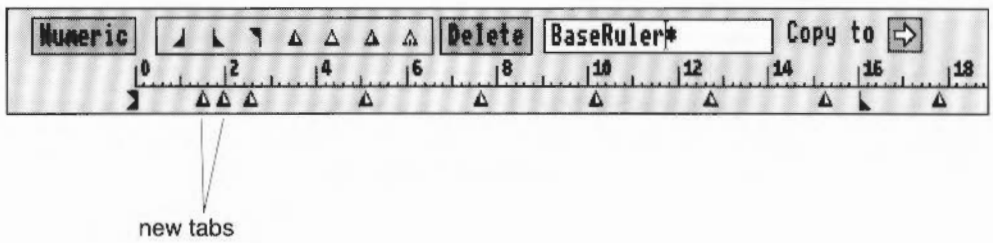
Bob will edit the base ruler, but because he has selected one area of the letter, this edit will only apply to the area of text selected – the appearance of the rest of letter will still be controlled by the base ruler.

The ruler has seven symbols, which represent the left margin, right margin, first indent and four types of tab stop.



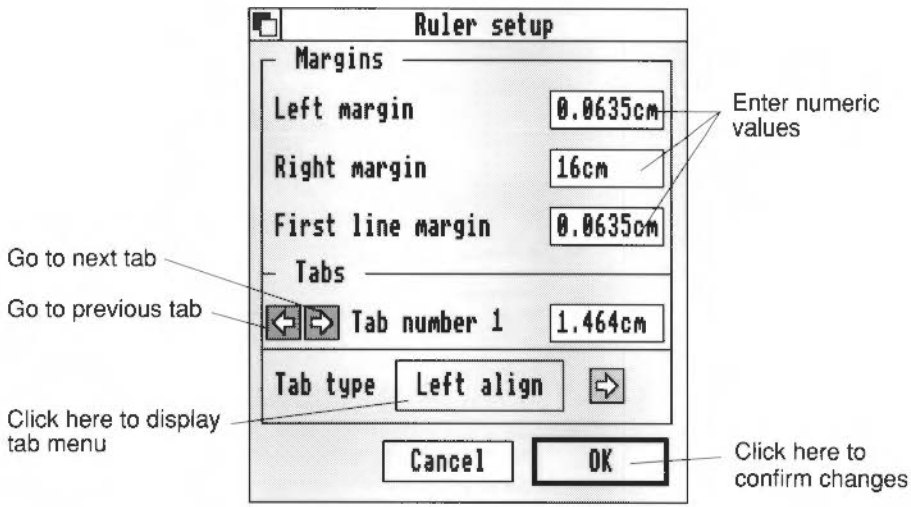
Bob clicks on the left tab symbol, and then at the 1.5cm mark on the ruler. A tab symbol appears on the ruler at the 1.5cm mark, and the hyphens in the text move to this position.

Next he clicks on the 2cm mark on the ruler to create another tab there. This time the tab symbol appears a millimetre past this mark, as his hand wasn't very steady; he drags the tab to exactly where he wants it, and the text moves to the position of the second tab.



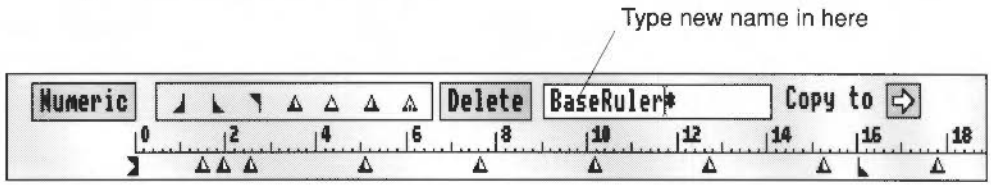
Setting tabs numerically

Alternatively, Bob could have clicked on the **Numeric** box and entered the type and position of the tabs numerically:



Naming an edited ruler

Every ruler has a name, so that it can be saved, and used again where the same format is needed. The original name displayed in the box in the centre of the ruler was `BaseRuler`. Since Bob has been making edits to it, it has changed its name to `BaseRuler*` – the star shows that it has been changed. Bob gives his new ruler the name `list`, which he types in the box on the ruler, and presses Return to confirm it. The ruler `list` only applies to the selected area; `BaseRuler` still applies to the rest of the letter.



Deleting a named ruler

To delete a named ruler, click on **Delete**. This deletes the ruler that applies to the current text and re-applies the `BaseRuler`.

Creating bullets

Bob is pleased with the results of his changes, but thinks that the final touch would be to replace the dashes at the beginning of each list item with a bullet point. To do this, he deletes the existing dash character and then types Ctrl-Shift-H; a bullet point is inserted in the text.

Music Matters 89 High Street Corbridge Sussex CB1 4XE Tel (0923) 4546

Mr W McCabe
22 Meadowbank Lane
Saffron Walden
SF3 4ZE

12th March 1993

Dear Mr McCabe

First of all, I would like to thank you for your recent custom. I hope that you are satisfied with your purchase of a Spanish guitar from Music Matters. You may be interested to hear that Music Matters is holding a mid-season sale, running from the 24th to the 27th March, in which we are offering a reduction of 15% off the price of all our musical instruments.

We are delighted to invite all our existing customers to a special sales preview on the evening of March 23rd at 7.30 pm, when we will be happy to discuss your musical requirements in a relaxed atmosphere over wine and cheese. Please note that you are under no obligation to buy.

Although Music Matters specialises in selling musical instruments of quality, we also stock a wide range of sheet music catering for a broad spectrum of musical tastes, ranging from classical, through jazz to popular music. We also possess a large collection of books written on topics suitable for the beginner and the advanced musician alike.

For two days only, on the 24th and 25th March, we are offering the following reductions:

- 15% off all musical instruments
- 20% off all books
- 25% off all sheet music

We look forward very much to seeing you on the 23rd.

Yours faithfully

Bob Davies
(Proprietor)
Tel (0923) 4545

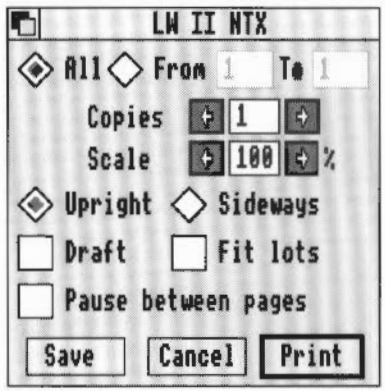
Bob saves his letter, ready for printing it out. The completed letter can be seen in the file `LetterE` on the `WPtutorial` directory on Data disc A.

Printing a document

Bob now wants to print out a paper copy of his letter. Before he can do this, he makes sure that he has a suitable printer correctly connected and set up and that he has loaded the !Printers application onto the icon bar (see the RISC OS 3 *User Guide* for details).

Printers cannot, of course, print right up to the edge of a sheet of paper; there are always 'print borders' around the edge which will not be printed. Bob makes a quick check that his layout can all be printed by choosing **Utilities/Print borders**. This displays the non-printing area as a grey band around the edge of the letter; anything to be printed which is covered by this band should be moved inside it.

To print the letter, he chooses **File/Print**; this displays the **Print** dialogue box:



He finally clicks on the **Print** button on the dialogue box to send the letter to his printer. (For a more detailed explanation of the different printing options on the **Print** dialogue box, see *Printing* on page 73 in the chapter entitled *Learning more about the Word Processor*).

Creating a new default document

Bob has to write a large number of letters, and realises that it would save a lot of time if he didn't have to set up the format of his letter, but could load a blank but ready-formatted letter each time. It would also give the business a more professional image if they had a consistent appearance. He also has the thought at the back of his mind, that, if he could include the company logo and address at the top of the page automatically, he might be able to save some money on printed letterheads too!

There are two ways he could do this:

- Save a blank file as a template
- Save the file as the new default Advance Word Processor document.

Saving a blank file as a template

To do this, he would delete all the text he wouldn't need again – that is, everything except the logo and the address:

He would save the 'blank' letter with the name such as `Letblank`. Next time he wanted to write a letter from the company he would load this file, rather than create a new one, remembering when it is finished to save it with a different name, so as not to overwrite the original template.

Saving a document as the new default

Warning: Saving a document as the new default causes the old default to be lost. Before you use this option, it is recommended that you save a copy of the old default layout, so that you can go back to it if you need to in the future. To do this, open a new Word Processor document (see *Creating a new document* on page 46), then immediately save it in your work directory, with a name such as `default`. If you subsequently want to revert to this default, open this file and save it as the default in the way described in the next paragraph.

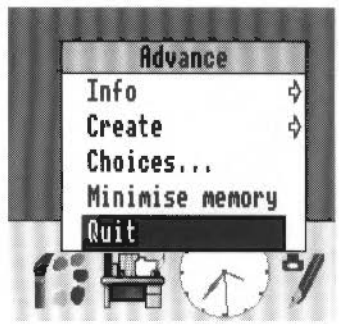
To make the blank letterhead his new default, complete with the address and Music Matters logo, so that it would appear every time he created a new document, Bob would choose **Utilities/Save as default**. This would become the new default after he exited Advance Word Processor and loaded it again.

Bob uses the Word Processor for many more things than writing letters, so plumps for the first option – saving a blank document as a template – as this gives him more flexibility.

Bob finishes his session by closing the document, clicking on the close icon on the document window.

Quitting Advance Word Processor

To leave Advance Word Processor and remove the other Advance tools as well, Bob clicks **Menu** over the Advance icon on the icon bar and chooses the **Quit** option.



Summary of this chapter

In this chapter you've been introduced to the basic features of Advance Word Processor. You've learnt how to load a document and move around it, to change its layout in simple ways, to edit text and change fonts. You've been introduced to printing a document and to creating document templates.

The following chapter, *Learning more about the Word Processor*, describes the more sophisticated features of Advance Word Processor. In this chapter, Bob creates a multi-page document and combines text columns and graphics in a more complex page layout.

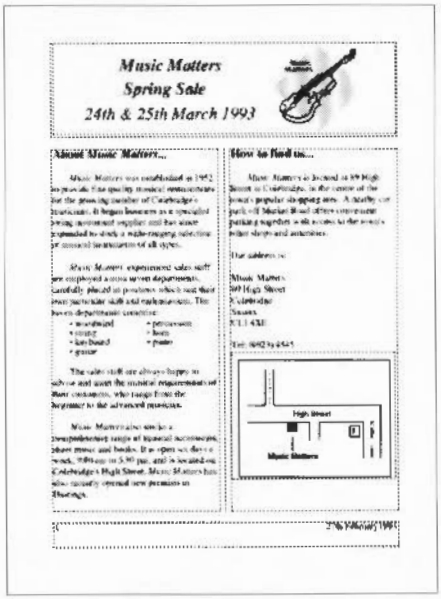
5 Learning more about the Word Processor

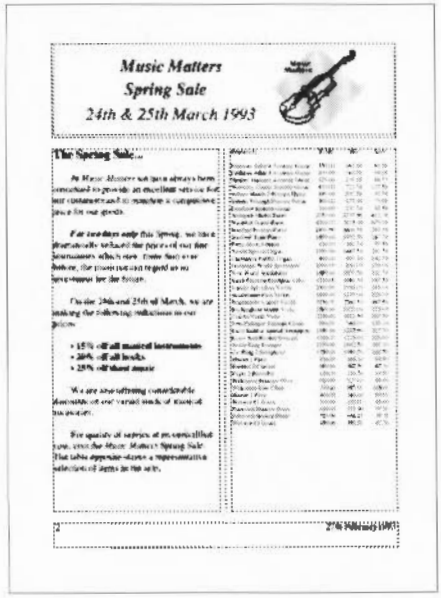
This chapter describes how to use the more sophisticated features of Advance Word Processor to create a new document with a complex layout, containing imported text and graphics; it also describes how to search and replace text, check its spelling, and to create mailshots with mail merge.

Introduction

Bob is gaining in confidence with Advance Word processor, and feels ready to try his hand with a double-sided leaflet to publicise the Music Matters sale. In it, he would like to include a brief history of Music Matters, a map of its location and a detailed description of the price reductions in the sale. He will include the leaflet with the letter he produced in the last chapter and send a copy to each customer listed in the Music Matters database.

This chapter provides step-by-step instructions on how to produce such a leaflet from scratch. (If you would like to see the finished leaflet before you start, open the file called `Leaflet4` in the `WPtutorial` directory on Data disc A).

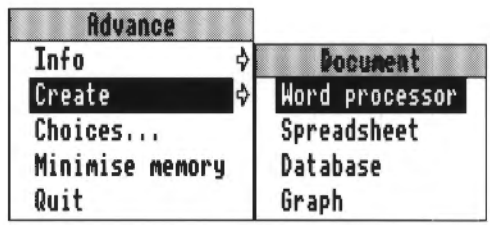




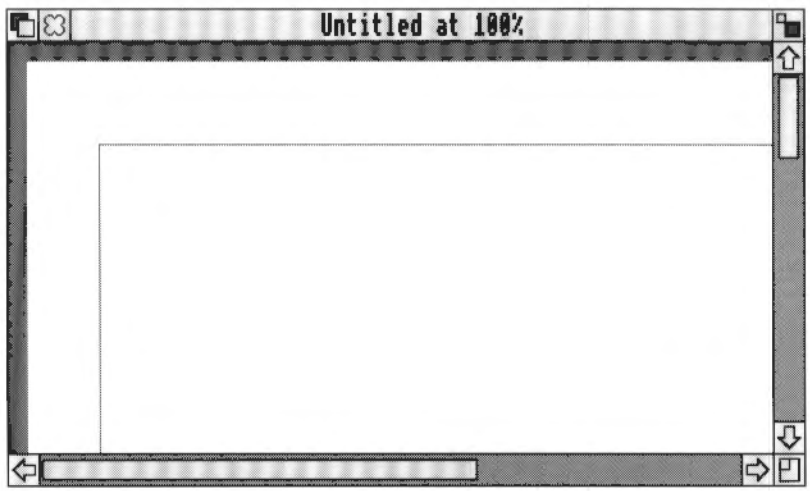
Creating a new document

To make a start, Bob loads a blank document.

To do this, he clicks Menu on the Advance icon on the icon bar, and chooses **Create/Word processor**.



A blank document appears on the screen.

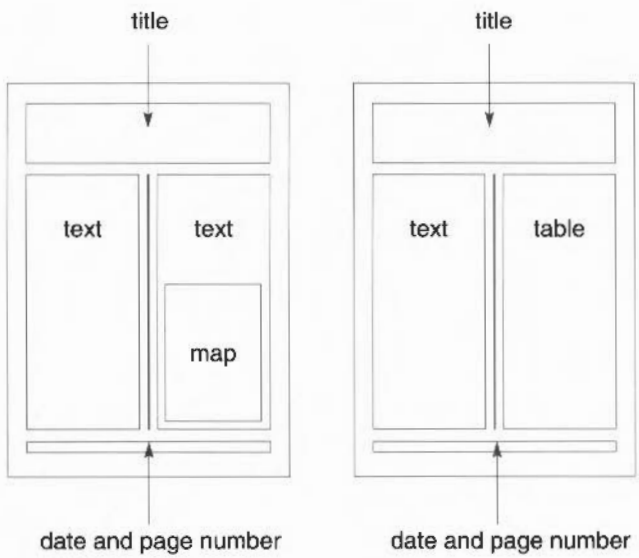


Bob scales it to 80% so that more of the document can appear on the screen, as he did in *Scaling the view* on page 22.

Page layout

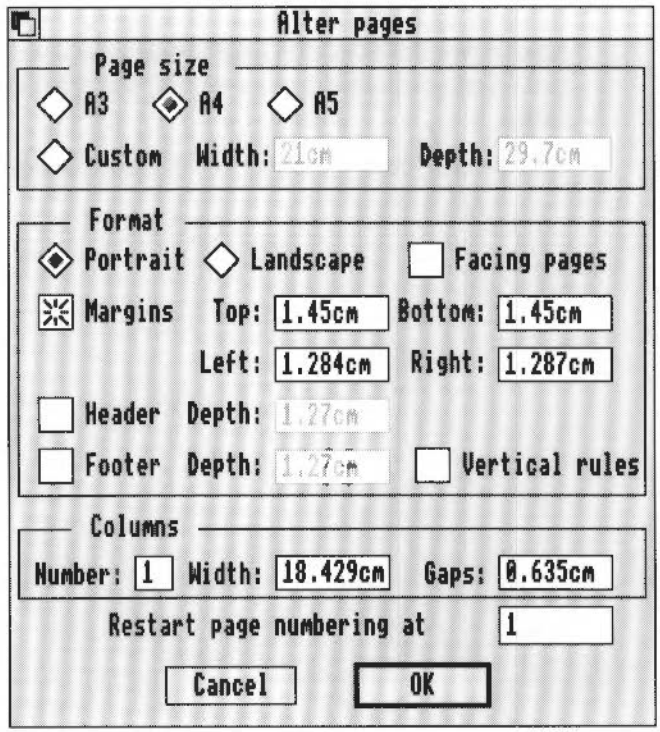
Before he adds any text or graphics, Bob needs to make some decisions about the layout of his leaflet. He decides to make the leaflet two A4 pages which he can convert to a double-sided single sheet on a photocopier. Each page will have two text columns, divided by a ruled line, and the leaflet will include graphics and a table.

On a piece of paper he outlines the following design:



Bob chooses the **Edit/Alter pages...** option to translate this design to the opened document.

The **Alter pages** dialogue box appears on the screen:

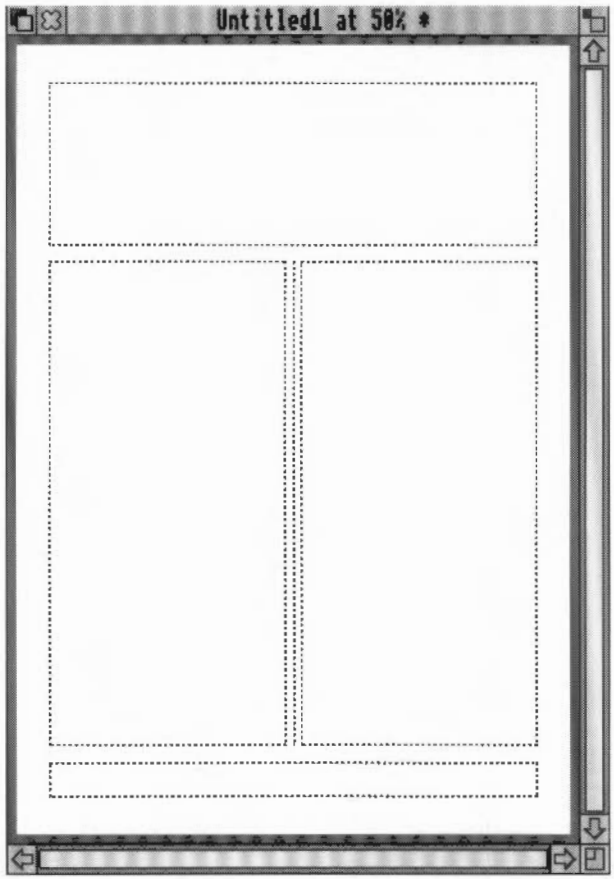


This dialogue box allows you to design the layout of the page, and **change** it at any time later on. The layout Bob wants will have two columns of text with a vertical rule between them, and he'll use repeating header and footer frames to carry the title and page numbers respectively:

- He specifies **Header** and **Footer** frames, and sets the **Depth** of the **Header** frame to 5cm, removing the previous value using Delete.
- He clicks in the **Vertical rules** box to specify a vertical line between the columns.
- Lastly, he specifies the **Columns Number** as 2.

He leaves the **Page size** as **A4**, the **Format** as **Portrait** with **Facing pages** (the option to mirror page layout in double-page spreads) **not** turned on, the **Restart page numbering at** 1 and the **Text margins** at their default values.

Bob clicks on **OK** to apply the changes and remove the dialogue box. His leaflet now looks like this (reduced here so that all of it can be seen):



Advance Word Processor will automatically transfer this layout to subsequent pages of the document.

Bob saves a copy of his work to disc. If you want to catch up with Bob at this stage, load the file `BlankLeaf` from the `WPtutorial` directory on Data disc A.

Importing text, graphics and data

The following types of file can be imported into an Advance Word Processor document:

- text files
- Edit files
- Draw files
- Paint files
- CSV files.

CSV files are files in which the data items are separated by commas (hence the name – Comma Separated Value). This type of file is produced by a number of applications, including Advance Spreadsheet and Database. Advance Word Processor expands the commas to tabs when importing a CSV file.

Importing text, graphics and data are all covered in more detail in this chapter, but the principle for importing all these types of file is the same – you just place the caret where you want to insert the file, then drag the file's icon from a directory display into the text frame of the open Advance Word Processor document. Provided the file type is one the Word Processor can handle, the file will be added at that point.

Bob now decides to make use of the import facility to add text to his leaflet.

Importing text

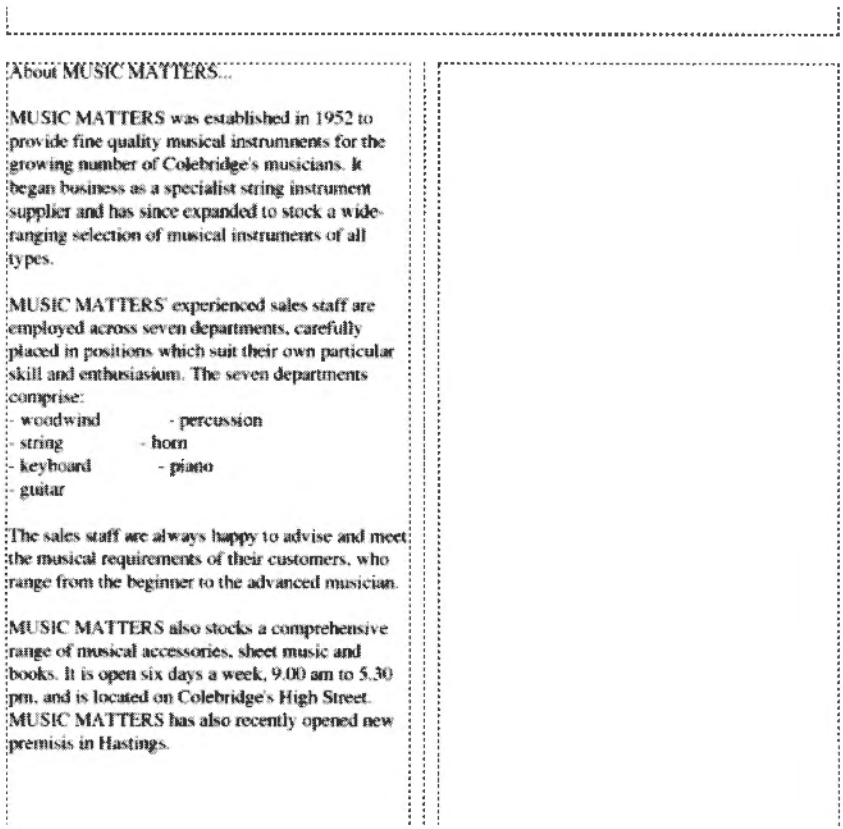
Before Music Matters bought Advance, Bob had written a short description of Music Matters on another word processor. To save time and effort, he decides to copy this text into his leaflet, so he saves it as a plain text file preparatory to importing it.

There's a copy of his file, `About`, in the `WPtutorial` directory on Data disc A.

To import his file, Bob

1. opens the directory display where the file is stored
2. drags the `About` file icon to the first column of his opened document
3. releases the mouse button.

A copy of the text in the file `About` flows into the first column of his document:



About MUSIC MATTERS...

MUSIC MATTERS was established in 1952 to provide fine quality musical instrumnents for the growing number of Colebridge's musicians. It began business as a specialist string instrument supplier and has since expanded to stock a wide-ranging selection of musical instruments of all types.

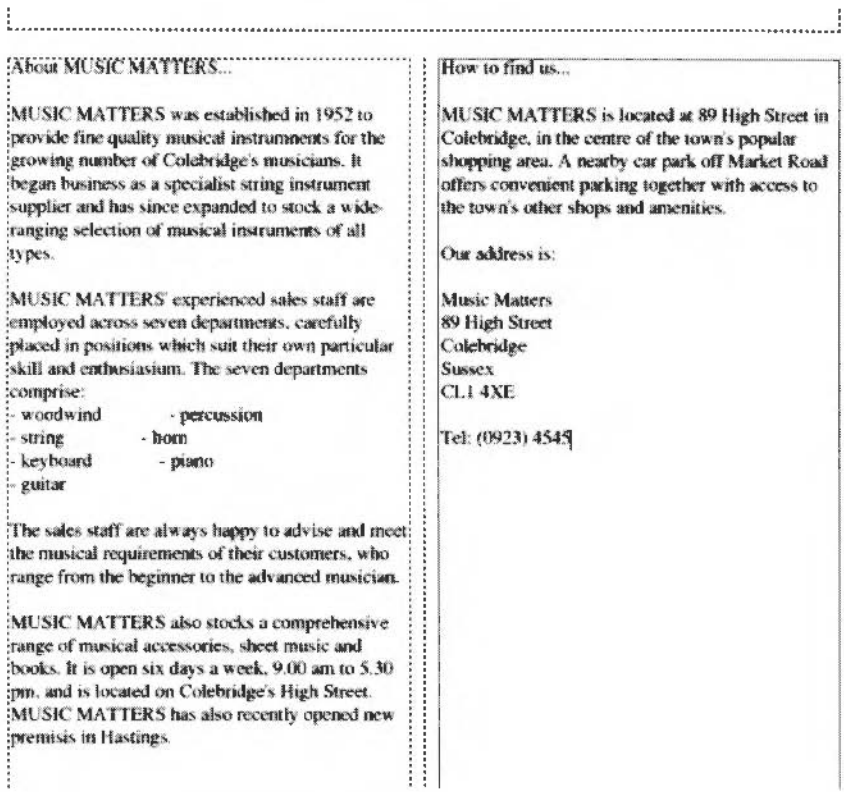
MUSIC MATTERS' experienced sales staff are employed across seven departments, carefully placed in positions which suit their own particular skill and enthusiasium. The seven departments comprise:

- woodwind - percussion
- string - horn
- keyboard - piano
- guitar

The sales staff are always happy to advise and meet the musical requirements of their customers, who range from the beginner to the advanced musician.

MUSIC MATTERS also stocks a comprehensive range of musical accessories, sheet music and books. It is open six days a week, 9.00 am to 5.30 pm, and is located on Colebridge's High Street. MUSIC MATTERS has also recently opened new premisis in Hastings.

Bob also copies a small text file describing the location of Music Matters into the leaflet in the same way. He wants this article to start at the top of the next column, so he positions the caret at the end of the imported text and chooses **Utilities/Insert/Column/page break**, then drops in the text file called `Location` from the `WPtutorial` directory on Data disc A:



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How to find us...

MUSIC MATTERS is located at 89 High Street in Colebridge, in the centre of the town's popular shopping area. A nearby car park off Market Road offers convenient parking together with access to the town's other shops and amenities.

Our address is:

Music Matters
89 High Street
Colebridge
Sussex
CL1 4XE

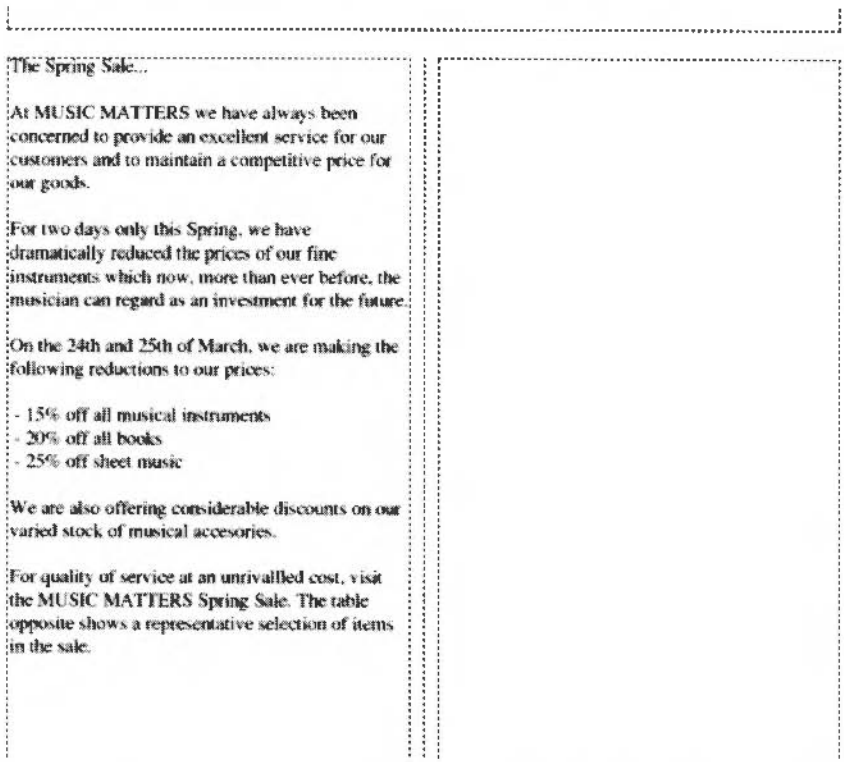
Tel: (0923) 4545

Bob would like to insert some more text, describing the sale itself. He wants this to appear on the **next** page, so he chooses **Utilities/Insert/Column/page break** again to insert a page break. In this case, there was only one page to start with, so the Word Processor creates a new one, and moves the cursor to the top of it.

Bob checks that the caret is at the top of the first column of the second page, then types in a description of the sale.

(There is a copy of the text he types in the file `Sale` in the directory `WPtutorial` on Data disc A, if you want to import it.)

When he has finished, the second page of the leaflet now looks like this:



The Spring Sale...

At MUSIC MATTERS we have always been concerned to provide an excellent service for our customers and to maintain a competitive price for our goods.

For two days only this Spring, we have dramatically reduced the prices of our fine instruments which now, more than ever before, the musician can regard as an investment for the future.

On the 24th and 25th of March, we are making the following reductions to our prices:

- 15% off all musical instruments
- 20% off all books
- 25% off sheet music

We are also offering considerable discounts on our varied stock of musical accesories.

For quality of service at an unrivalled cost, visit the MUSIC MATTERS Spring Sale. The table opposite shows a representative selection of items in the sale.

Bob saves his work – if you want to pick his leaflet up at this point, you will find his rough draft in the file `Leaflet1` in the `WPtutorial` directory on Data disc A.

Text editing

Now that the text of the leaflet is in place, Bob would like to make some changes to it to create a more professional publication.

First he selects all the text and changes the size to 14pt (using **Effects**).

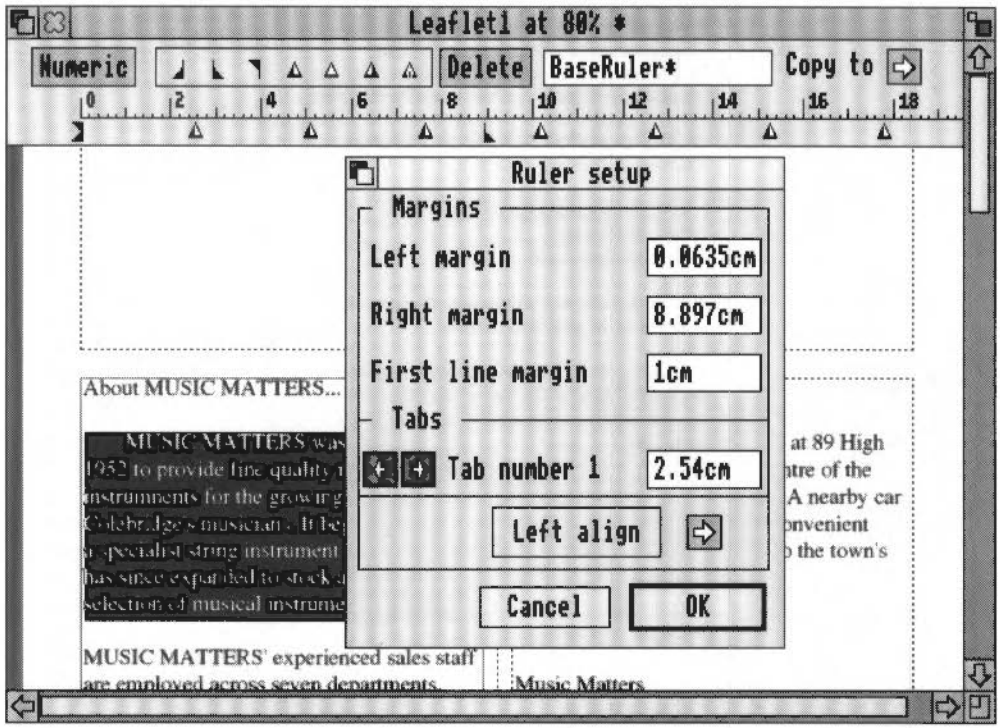
He thinks that the columns look too regimented and so, to break up the flow of text, he decides to indent the first line of each paragraph. To do this, he uses the rulers feature of Advance Word Processor, introduced in *Defining margins and tabs* on page 35.

First line indents

1 To indent the first line of the paragraph, he goes back to page one and selects the first paragraph of text in the leaflet (excluding the heading) and chooses **Show ruler**.

This displays the current ruler for the paragraph, which is still the base ruler.

2 To specify the first line indent he wants, he clicks on **Numeric** to display the numeric value dialogue box:



3 He specifies a **First line margin** of `1cm` and clicks on **OK**.

4 He wants to apply this change throughout the leaflet, so he clicks on **Copy to**, which displays a list of the existing rulers. The way to **change** a ruler is to make some local changes, then copy this set-up to the ruler on the list you want to change; any changes you make will apply to all occurrences of that ruler in the document. The ruler which applies to **all** paragraphs at the moment is the default one, `BaseRuler`, so he clicks on `BaseRuler`.

5 A dialogue box asks him to confirm he wants to change `BaseRuler` throughout the document; this is what he wants to do, so he clicks on **OK**. `BaseRuler` is now changed, and the whole document is affected by this change.

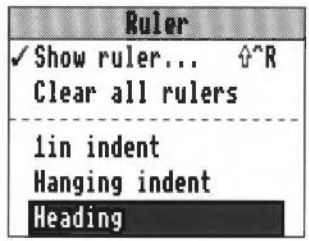
Bob doesn't want the headings and the address to be indented, so he creates a new ruler for these:

1 He selects the first heading, which is the first line of text, then clicks on **Numeric**.

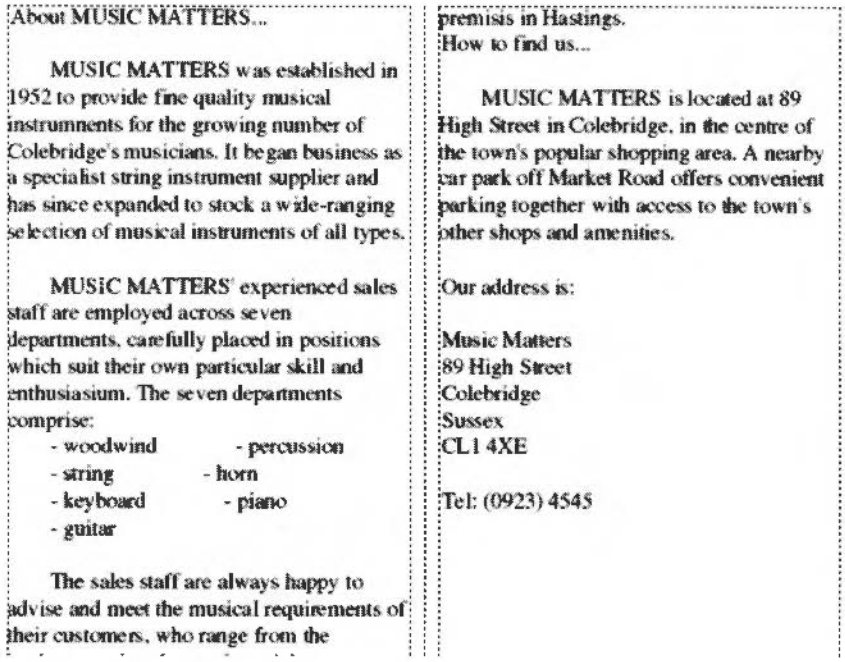
2 He sets the **First line margin** back to 0.

3 He gives this new ruler the name `Heading` (by typing in this name and pressing Return).

4 He applies it to the other headings and the address by selecting each area in turn and choosing **Ruler/Heading** from the main menu:



The leaflet now looks like this:



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- horn
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- piano
- guitar

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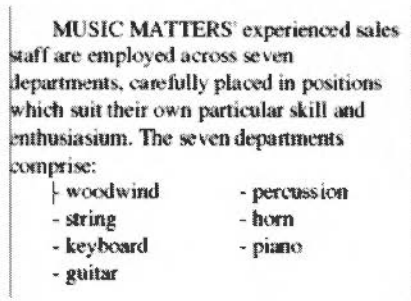
Our address is:

Music Matters
89 High Street
Colebridge
Sussex
CL1 4XE

Tel: (0923) 4545

The listed items in the first column of page one were formatted in the original Edit document by spaces, and have got out of line. Bob decides to format these properly with tabs. He deletes the spaces (using Delete) between the items on the same line, and presses Tab between each, once or twice, until they line up like this:


MUSIC MATTERS' experienced sales staff are employed across seven departments, carefully placed in positions which suit their own particular skill and enthusiasium. The seven departments comprise:

- woodwind
- string
- keyboard
- guitar
- percussion
- horn
- piano

More text editing

The documents imported into the leaflet were plain text files and so have very little in the way of formatting, and no Effects at all. Bob wants to improve the appearance of the text. Using the techniques explained in the previous chapter (see *Changing the appearance of the text* on page 28) he changes

- the size of the headings to **18 pt** and the font to **Bold**
- the minus sign at the start of each listed item to a bullet (Ctrl-Shift-H)
- the listed items in column 1 of page 2 to **Bold** font
- the font of the words 'two days only' in column 1 on page 2 to **Bold Italic.**

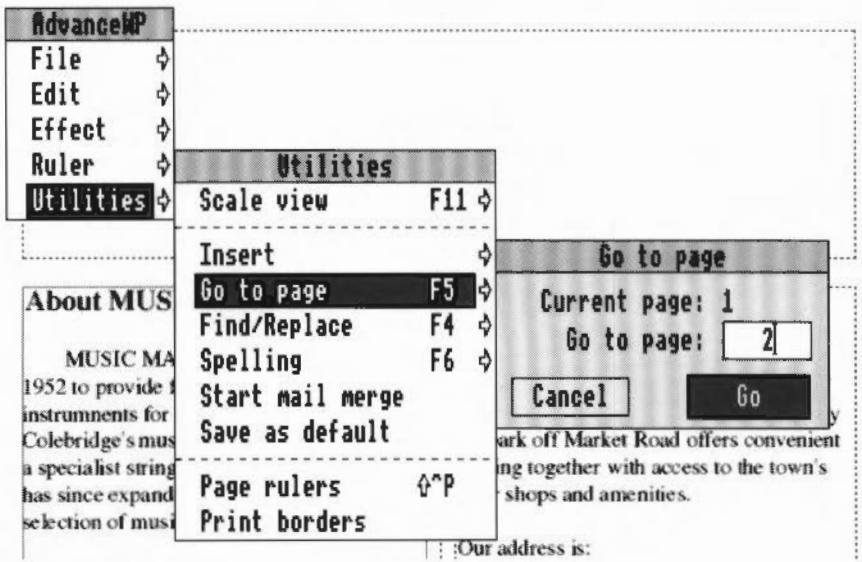
Using Line spacing to fit text

The greater size of the heading text has now forced the last line of *About Music Matters* to the top of the second column on the first page. Bob thinks the layout would be improved if it could be pushed back to the first column, so that the adjoining column could start cleanly with a heading.

To achieve this, part of the first article must be compressed. A good candidate for this is the block of bullet points. Bob selects this block, including the blank line below, then chooses **Effect/Line spacing** to change the line spacing of the block to `14pt` (see *Changing the line spacing* on page 32 for more information on this option). This has the effect of shortening the text column, so that the last line of the article is brought back to the first column.

Moving from page to page

So far Bob has used the scroll bars to move from page to page in the leaflet. As an alternative method, now he has more than one page, he can use the **Go to page** option on the **Utilities** menu. To do this, he types in the page number he wants in the displayed box and clicks on **OK**. This is a particularly useful feature when working on long documents.

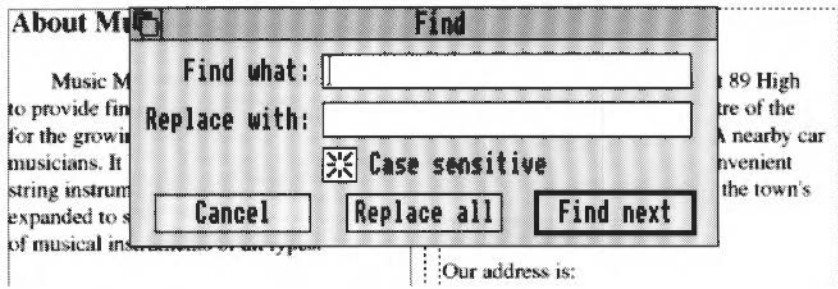


Searching and replacing text

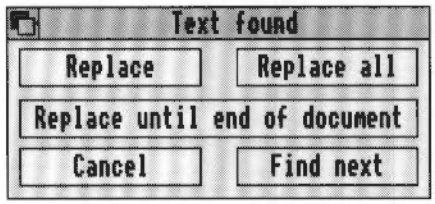
To maintain a consistent style throughout his leaflet and letter, Bob now finds all occurrences of the text 'MUSIC MATTERS' and replaces them with the words 'Music Matters' in upper and lower case (i.e. initial capital, or upper case letters, the rest of the word in small, or lower case letters). To do this, he uses the Advance Word Processor find and replace facility.

He puts the caret at the start of the leaflet, then chooses the **Utilities/Find/Replace** option.

This action displays the **Find** dialogue box. In the **Find what** box, he types the words 'MUSIC MATTERS' and in the **Replace with** box, the words 'Music Matters'. Then he makes the search **Case sensitive** and clicks on the **Replace all** button.



Once he has done this, Bob uses the search facility again to find each occurrence of the words 'Music Matters' and changes the font of the words (excluding the title and address) to **Italic** using the Ctrl-I short-cut. This time, he clicks on the **Find next** button to start the search. The **Text found** dialogue box appears:



He presses Ctrl-I to change the font, then clicks on **Find next** to move on to the next one.

Advanced searching

Wildcards

It is not always necessary to specify an exact target when searching. A 'wildcard' can sometimes be used. Wildcards are characters, which, as their name implies, can represent more than one other character in a search. Advance Word Processor recognises the following wildcards:

#	matches any single character
*	matches any group of characters in a word
@	matches any number of words

(A 'character' here typically means a letter, number or punctuation mark.)

For example, if 'music*' were typed in the **Find what** box, the Advance Word Processor finds the words music, musical, musician and musicians in the leaflet.

Finding special characters

Tabs and carriage returns can be found using these codes in the **Find/Replace** dialogue box:

`{cr}`	finds	carriage returns
`{tab}`	finds	tabs

Other special characters may be found by specifying their character number (preceded by a backslash) in curly brackets. For example,

`{\169}`	finds	©

The wildcards # * and @ can only be found by specifying their character numbers in the same way, which are 35, 42 and 64 respectively.

The character sets and their corresponding numbers are shown in *Appendix H: Character sets* on page 369.

Bob has finished formatting the text of his leaflet now, so before he moves on to graphics, he saves his draft, this time using F3 followed by Return, which is a quick way of saving a file which has been saved before. (F3 displays the existing pathname of the file for you, in case you want to change that – if you don't, just press Return to confirm it.) There are other such 'keyboard short-cuts', listed in *Appendix D: Keyboard short-cuts* on page 319, which you can use to save you time as your confidence with Advance Word Processor increases.

If you want to catch up with Bob's progress, the latest version of the draft is in the file `Leaflet2` in the `WPtutorial` directory on Data disc A.

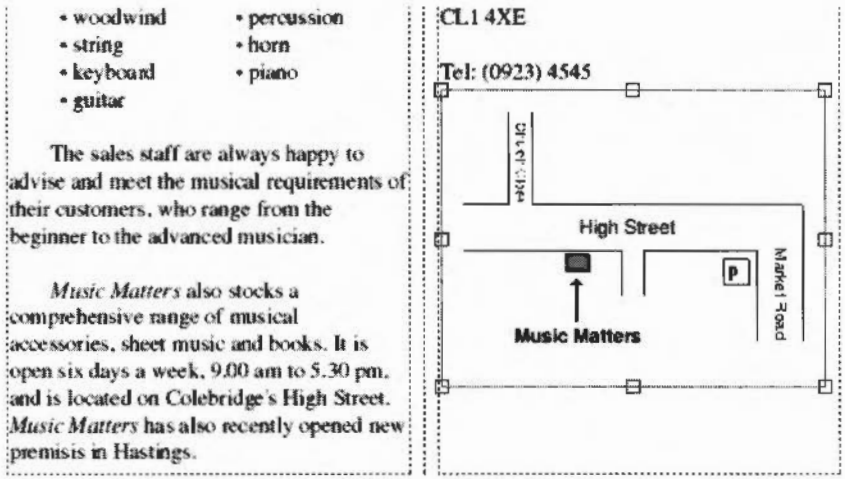
Importing graphics

Bob would like to add some graphics to make his leaflet more visually appealing. In particular, he wishes to add a title, the Music Matters logo and a map showing the location of the shop.

You can add graphics to a document, in the form of Paint and Draw files, using the same technique for importing text files described in *Importing text* on page 50.

To import the map into his copy of the leaflet, he places the caret after the telephone number where he wants it to appear, finds the Draw file called `Map` in the `WPtutorial` directory on Data disc A and then drags the file icon to the caret. He releases the mouse button to drop the graphic into the document window.

A copy of the map appears in the document:

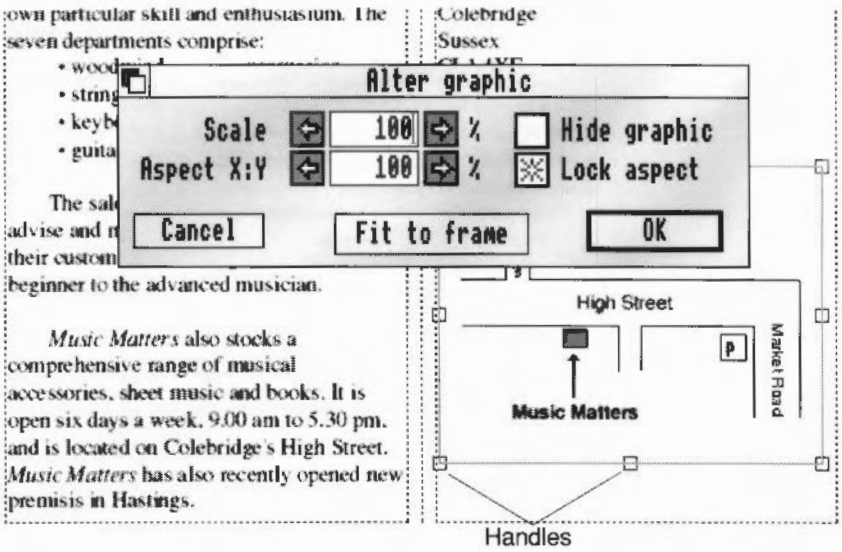


The graphic is 'embedded' into the text at this point – if text is added above it, the graphic will move down to accommodate it.

An Advance Word Processor graphic frame behaves very much like a text character in pagination, and is copied or cut in the same way – see *Cutting and copying a graphic frame* on page 62.

Graphics editing

The map is a little too large for the column. Bob wants to reduce its size and then move it to fit neatly under the text. To do this, he double-clicks on the graphic to display the **Alter graphic** dialogue box.



You can

- change the size of the graphic, using the **Scale** box
- alter its aspect ratio (the relationship between its height and its width), using the **Aspect X:Y** box; a number less than 100 makes the graphic thinner, a number greater than 100 increases its width
- preserve the aspect ratio when resizing a graphic, by clicking on **Lock aspect**; this prevents distortion of the image
- match the graphic to the size and shape of the graphics frame, using **Fit to frame**.

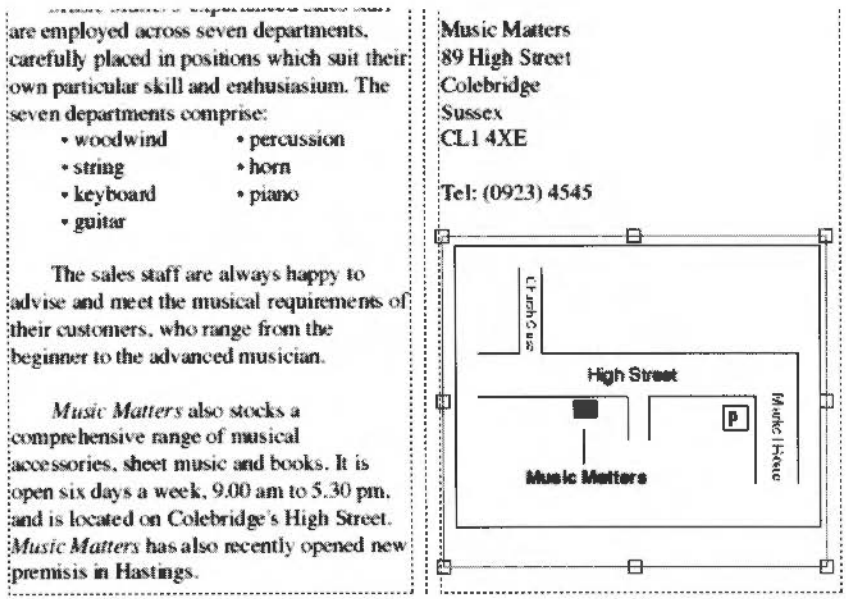
(Note that the **Alter graphic** dialogue box can also be displayed by choosing **Edit/Alter graphic**... when you have clicked inside the graphic frame, so that i green outline and handles are visible.)

To resize the map, Bob enters 95 in the **Scale ratio** box and clicks on **OK** t the change. This scales the map to 95% of its original size, so that it fits we the text column.

Note: If you include large and detailed Draw files reduced to tiny sizes document may fail to print.

Moving a graphic

Bob makes fine adjustments to the position of the map by moving it around inside its graphic frame. To do this, he clicks on it and holds down Select; the pointer turns into a hand, and he can drag the graphic around inside the frame.

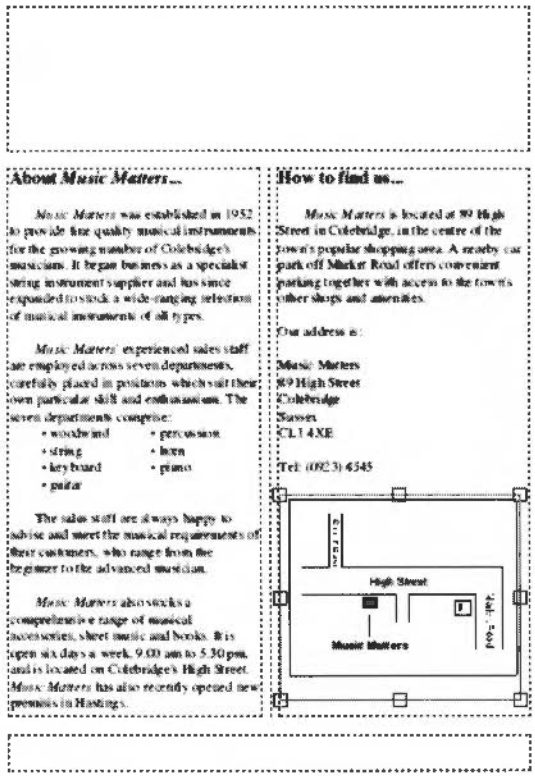


If the frame is too small for you to move the graphic where you want to, drag the handles of the frame to make it bigger.

Cutting and copying a graphic frame

The graphic frame will always remain anchored to its insertion point in the text, and its size will be bounded by the height and width of the text frame into which it has been inserted. If you want to move the graphic frame elsewhere in the document, you have to select, cut and paste it to a new caret position, as you would a chunk of text. It is not always easy to select a graphic – try placing the caret either before or after it in the text story, then clicking on the other side of it with Adjust. A graphic is selected when it is shown inverted – it is **not** selected for cutting or copying when it has been selected by clicking on it (so that it displays its green outline and resizing handles).

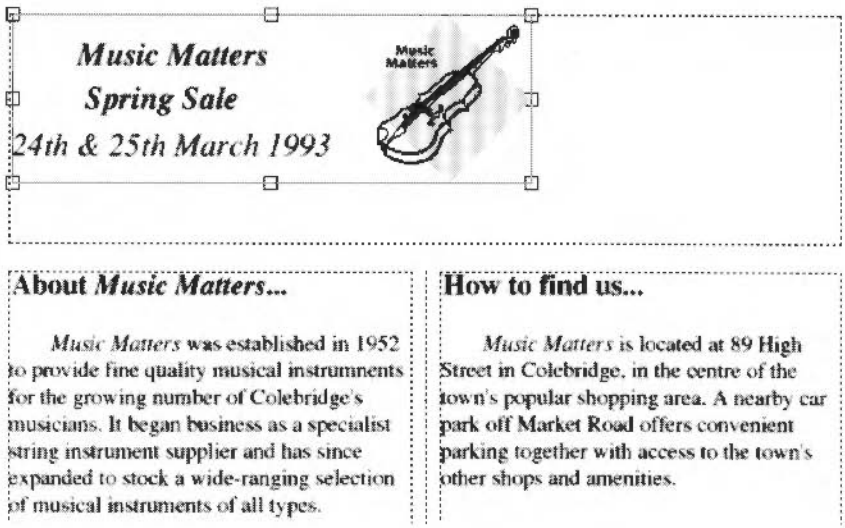
The first page now looks like this.



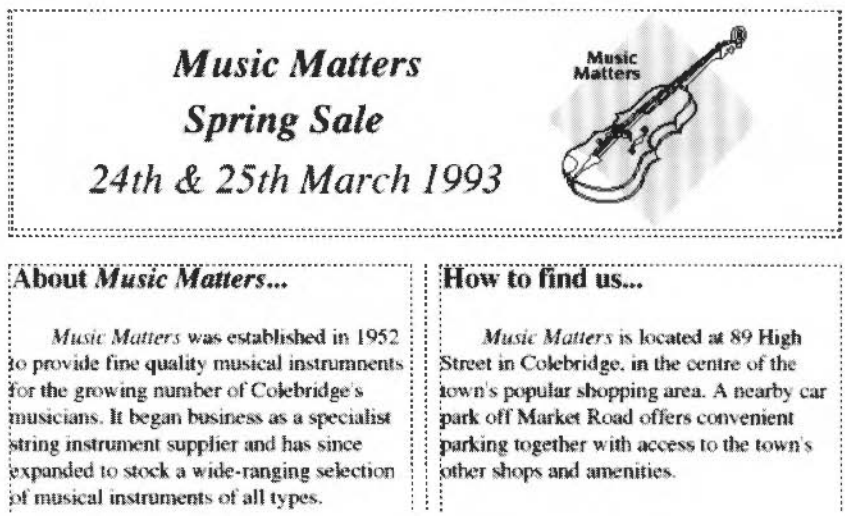
Headers and footers

Bob thinks the page would benefit from the addition of an eye-catching title and the Music Matters logo. He can put these into a header frame, so that they are repeated on every page. Accordingly, he creates a Draw file containing some title text and the logo and imports this into the leaflet. The Draw file he uses is called `Title` in the `WPtutorial` directory on Data disc A.

He places the caret in the first header, then drags `Title` into it:



The graphic doesn't fit very well, so Bob enlarges both the graphic frame and the graphic to fill the header frame (by dragging the handles of the frame with Adjust), taking care not to drag them too close to the edges of the frame, or the graphic would disappear!



This title will now be repeated on every page.

Additional headers and footers

If Bob had wanted a **different** header on a later page, he could have done this using **New Header/Footer**.

By clicking on the Header or Footer which he wanted to change (the one on page two in his case), then choosing **New Header/Footer**, he could have added a new one, applying to that page only.

If a document extends over several pages, and you want a new Header or Footer to apply to more than one page, you can extend the range of a new Header or Footer as follows:

1. At the first or last page of the range of pages you want the new Header or Footer to apply to, click on the Header or Footer and choose **New Header/Footer**. For example, if you want a new footer for pages five to eight, click on either five or eight.
2. Go to the page at the other end of the range and click Adjust. In the example, if you had clicked on page eight, click Adjust on page five.
3. Edit the new Header or Footer for that range.

   The contents of the headers and footers both before and after this new range remain as they were, but you should note that the addition of a new range splits the original range. So, in this example, you now have three separate ranges; pages one to four, pages five to eight, and page eight onwards.

Editing headers and footers

To move the caret directly to the first header or footer of a range, double-click on the header or footer frame on any page (if you are already in the first frame of the range, just single click). You can then edit the contents of the frame.

Inserting a page number

Next Bob would like to add the page number and date to the bottom of each page (in the footer). To edit a footer you go to the first footer of a range, and edit that one. In this case, there is only one range of footers, so he goes to page one by double-clicking on either footer.

He chooses **Utilities/Insert/Page number**.

Advance Word Processor inserts the page number in the footer frame. The page number is also included in the footer of subsequent pages, incremented by one. Numbering starts at 1 by default, but can be set to any number using the **Edit/Alter pages** dialogue box (**Restart page numbering at**); this is useful when a publication is made up of a number of files (chapters, for example), where page numbering should continue where it left off in the previous file.

Inserting the date

Bob also wants to insert the date in the footer, on the righthand side, so he creates a new ruler with a right-aligned tab. *Setting tabs* on page 36 tells you how to do this, but here is a quick recap:

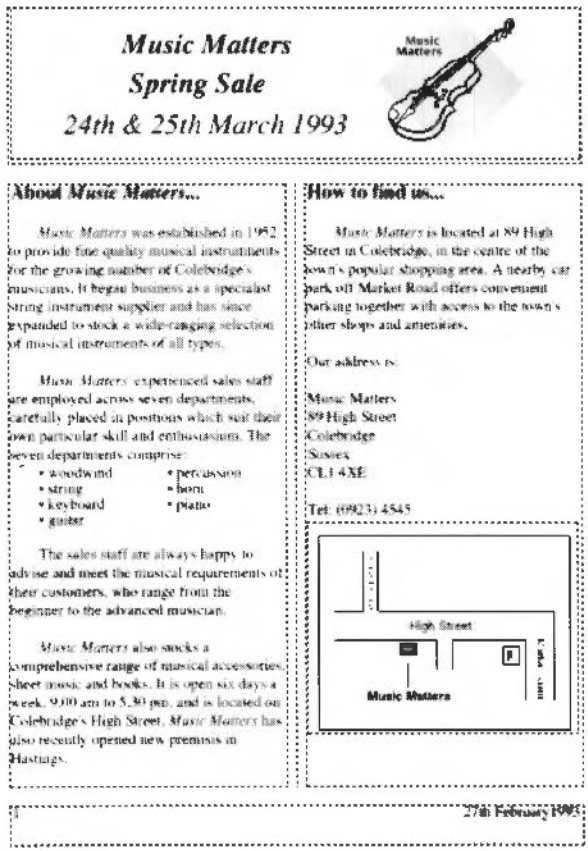
1 He chooses **Show ruler...**.

2 He removes the two rightmost tabs by dragging them up and releasing the mouse button.

3 He clicks first on the right-aligned tab icon and then, to place the tab, he clicks just below the ruler and slightly to the left of the righthand margin.

4 He renames the new ruler `Footer` and presses Return.

He places the cursor in the footer after the page number, tabs the caret across to the righthand side of the footer, then chooses **Utilities/Insert/Current date** to put in the date. The leaflet should now look like this:



If you want to catch up with Bob, the latest version of the draft is in the file `Leaflet3` in the `WPtutorial` directory on Data disc A.

Importing data

Bob would like to include a list of instruments and prices to highlight the price savings in the Music Matters sale. He gives his financial manager, Jim Robinson, a call and finds that the information is already available in an Advance Spreadsheet. It contains data describing the type and make of instrument, its original retail price, sale price and corresponding price reduction. Jim has saved this as a TSV (Tab Separated Value) file, and a copy of it is included on Data disc A (`Sale_TSV`).

To copy this data to his leaflet, Bob simply places the caret at the bottom of the text in the first column on page 2, chooses **Utilities/Insert/Column/page break** to move it to the top of the second column, then drags the file `Sale_TSV` onto the page. The result wasn't quite what Bob expected!:

The Spring Sale...

At *Music Matters* we have always been concerned to provide an excellent service for our customers and to maintain a competitive price for our goods.

For two days only this Spring, we have dramatically reduced the prices of our fine instruments which now, more than ever before, the musician can regard as an investment for the future.

On the 24th and 25th of March, we are making the following reductions to our prices:

- **15% off all musical instruments**
- **20% off all books**
- **25% off sheet music**

Instrument	Retail	Sale	Save
Feldman Adler 4 Acoustic Guitar			
550.00	467.50	82.50	
Feldman Adler 3 Acoustic Guitar			
400.00	340.00	60.00	
Medley Superior Acoustic Guitar			
325.00	276.25	48.75	
Waverley Classic Electric Guitar			
850.00	722.50	127.50	
Subaro Master 2 Electric Guitar			
650.00	552.50	97.50	
Subaro Triumph Electric Guitar			
500.00	425.00	75.00	
Excelsior Spanish Guitar 350.00			
297.50	52.50		
Steinpath Master Piano	2750.00		
2337.50	412.50		
Warwick Grand Piano	4500.00		
3825.00	675.00		
Stanford Premier Piano	1890.00		

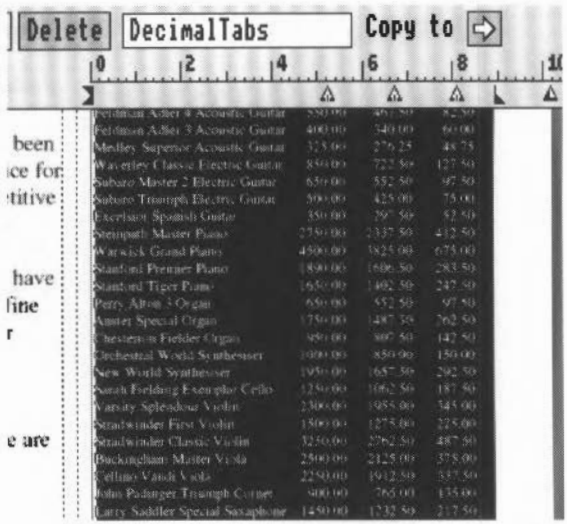
Bob is dismayed by the appearance of the table, and begins to wonder whether it was a good idea to import it at all. The text is obviously too large, so to reduce its size he selects all of it (the extra text has created and spilled over onto a third page) and changes it to 9pt (using **Effect/Text size/Other/9**).

His next task is to adjust the tabs to fit each entry onto one line.

Creating a table using tabs

Advance Word Processor has replaced the commas in the TSV file by left-aligned tabs. Bob would like to line up the columns of figures in his table using decimal tabs. To do this he creates two new rulers, one for the body of the table and one for the headings, calling them respectively DecimalTabs and CentreTabs.

He highlights all the text in the table and then chooses the **Show ruler** option. He gets rid of the existing tabs by dragging them upwards from the ruler, then releasing Select. He clicks on the decimal tab symbol (see *About rulers* on page 37) and then clicks on the ruler at the 5.2 cm marker and again at the 6.7 and 8.1 cm markers. He gives the ruler the name `DecimalTabs`. Bob's table now looks much neater:



Next he selects the table headings only, and changes the font to **Bold** (Ctrl-B). He goes to the ruler and deletes the old tabs. He clicks on the centre tab symbol, then clicks again on the ruler at 5.2, 6.6 and 8.0cm. He gives the new ruler the name `CentreTabs` (and presses Return).

The headings line up over their respective columns, and the completed table now looks like this:

Instrument	Retail	Sale	Save
Feldman Adler 4 Acoustic Guitar	590.00	467.50	82.50
Feldman Adler 3 Acoustic Guitar	400.00	340.00	60.00
Medley Superior Acoustic Guitar	325.00	276.25	48.75
Waverley Classic Electric Guitar	850.00	722.50	127.50
Subaro Master 2 Electric Guitar	650.00	552.50	97.50
Subaro Triumph Electric Guitar	500.00	425.00	75.00
Excelsior Spanish Guitar	350.00	297.50	52.50
Steinpath Master Piano	2750.00	2337.50	412.50
Warwick Grand Piano	4500.00	3825.00	675.00
Stanford Premier Piano	1860.00	1806.50	283.50
Stanford Tiger Piano	1650.00	1402.50	247.50
Perry Alton 3 Organ	650.00	552.50	97.50
Amster Special Organ	1750.00	1487.50	262.50
Chesterton Fielder Organ	950.00	807.50	142.50
Orchestral World Synthesiser	1000.00	850.00	150.00
New World Synthesiser	1950.00	1657.50	292.50
Sarah Fielding Exemplar Cello	1250.00	1062.50	187.50
Varsity Splendour Violin	2300.00	1955.00	345.00
Stradwinder First Violin	1500.00	1275.00	225.00
Stradwinder Classic Violin	3250.00	2762.50	487.50
Buckingham Master Viola	2500.00	2125.00	375.00
Celino Vanli Viola	2250.00	1912.50	337.50
John Padinger Triumph Cornet	900.00	765.00	135.00
Larry Saddler Special Saxaphone	1450.00	1232.50	217.50
Louis Arm Blower Trumpet	1500.00	1275.00	225.00
Astler King Trumpet	1250.00	1062.50	187.50
Cat King 2 Saxophone	1750.00	1487.50	262.50
Master 2 Flute	430.00	365.50	64.50
Premier 2 Clarinet	450.00	382.50	67.50
Flight 2 Recorder	130.00	110.50	19.50
Wilkinson Superior Oboe	620.00	527.00	93.00
Wilkinson Elite Oboe	700.00	595.00	105.00
Master 1 Flute	400.00	340.00	60.00
Winston F1 Drum	300.00	255.00	45.00
Falmouth Masters Drum	650.00	552.50	97.50
Falmouth Student Drum	525.00	446.25	78.75
Winston F3 Drum	450.00	382.50	67.50

Bob could also have drawn a box around text, using the **Effect/Paragraph border** menu option, but in this case he decides against it as he would like to keep the layout simple.

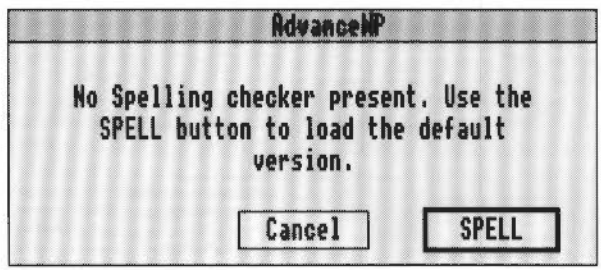
Checking the spelling

Bob is now happy with the contents and layout of his promotional leaflet, but has noticed, as you might have done, that it contains some spelling mistakes, and needs spell checking.

To do this, he positions the caret in the text and chooses **Utilities/Spelling/Check entire text**. This, as its name implies, checks all the text in a document, starting from the beginning. **Check from cursor** spell checks the text from the cursor position to the end of the file.

(Bob is using in his leaflet text written elsewhere, and so has to spell check it as a block of text. If he had typed in this text himself, he might have used **Check as you type** instead, which beeps whenever an incorrectly-spelt word is typed.)

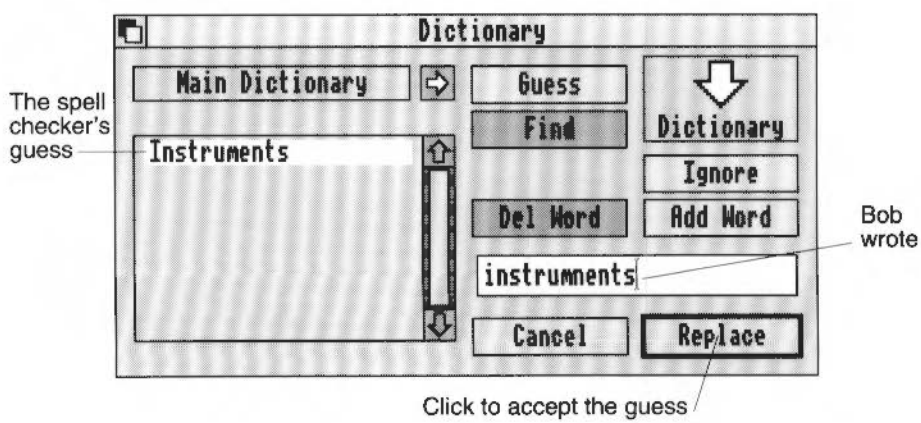
A warning box, telling him that the spelling checker is not loaded, appears:



He clicks on **SPELL** to load the spelling checker and start it checking.

(**Note**. To save memory, the Advance Word Processor does not load the spelling checker automatically at the start of a session. If you would prefer it to be loaded at the start, see *Customising your environment* on page 83.)

The checker stops at any suspect word and displays the spelling dialogue box:



The spelling dialogue box gives a choice of options:

- **Guess** at what the word should be
- **Find** the closest match to the word in the dictionary
- **Ignore** the word in future
- **Del**ete the **Word** from your own dictionary (see *Using dictionaries* on page 71)
- **Add** the **Word** to your own dictionary (see *Using dictionaries*)
- **Cancel** the dialogue box
- **Replace** the misspelt word with the selected word.

Correcting a spelling mistake

Bob chooses the appropriate option (in this case, **Replace** 'instrumnents' by the correct spelling guessed by the checker – 'Instruments') and the checker continues to check the leaflet. Although the spelling checker suggests 'Instruments', with an initial capital letter, it will match the capitalisation of the word it replaces – in this case 'instruments' (all lower case letters).

If the checker finds no mistakes, no dialogue box is displayed.

Words not in the main dictionary

When the spelling checker reaches the table of musical instruments, it stops at each instrument name to question the spelling.

Even though a word or name may be correct, if it is not in the spelling checker's dictionary, it will be faulted. This will include technical terms and colloquialisms, for example.

To overrule the spell checker, click on **Ignore**, and it will move on to the next word.

The spell checker's knowledge can be extended by creating extra dictionaries.

Using dictionaries

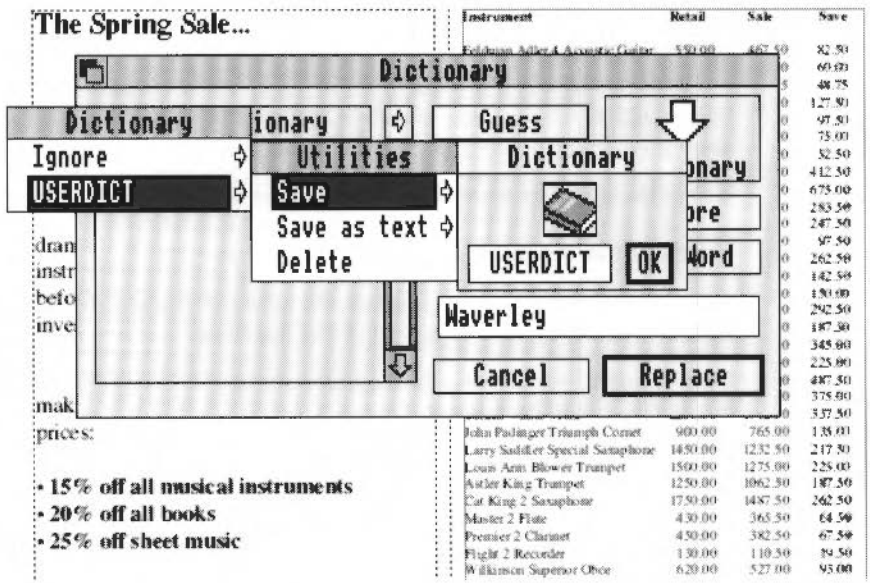
There are three types of dictionary that can be used:

- **Main** dictionary (the spelling checker uses this dictionary automatically; it contains about 60,000 words)
- **User** dictionary (used for specialist words; it can hold up to 1,500 words)
- **Ignore** dictionary (used for unusual words or names that you do not want to add to a User dictionary but would **not** like the spelling checker to fault). Ignore dictionaries are created, loaded and edited in exactly the same way as User dictionaries.

Creating a User or an Ignore dictionary

Bob uses Advance Word Processor for most of his paperwork and decides to create his own dictionary containing musical terms and instrument names. Each time a correct word unknown to the main dictionary appears, he presses **Add Word**. This creates then adds the word to his User dictionary. When he quits his document, the User dictionary is saved as well.

To view his User dictionary, once he has added some words to it, Bob first loads Edit from his **Apps** directory, then clicks on **Main dictionary;** the **Dictionary** sub-menu appears. This shows that there are two dictionaries loaded – **Ignore** and **USERDICT**. **USERDICT** has a menu option **Save as text**, and Bob drags the `USERDICT` file icon onto the Edit icon on the icon bar.

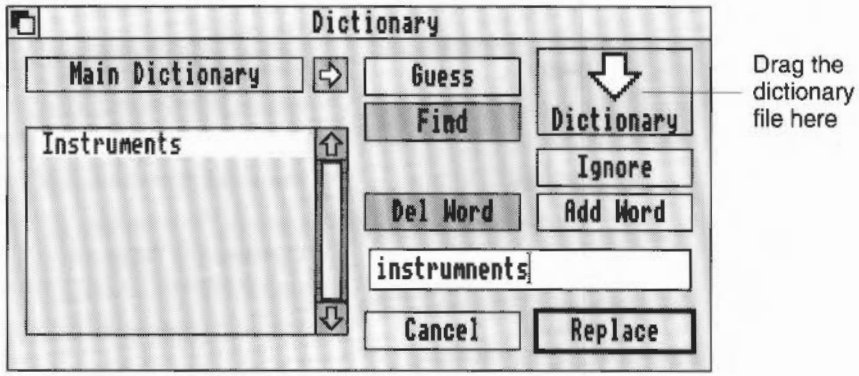


The words currently held in his User dictionary are displayed. This file will grow as he **Add**s more to it during spell checking.

At the end of the session, Bob saves his USERDICT to a file. Because it contains musical terms familiar to other members of the company, once it has grown to a reasonable size, he sends copies of it to the other Advance Word Processor users at Music Matters, to speed up their spell checking.

Loading a User or Ignore dictionary

When he wants to check musical terms in a document again, he loads his USERDICT into the Spelling checker by dragging its file icon onto the **Dictionary** icon:



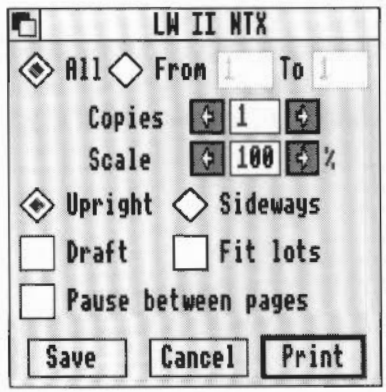
Editing a User dictionary

Bob can add new words to the User dictionary later by editing it as a text file (using the **Save as text** option described above).

Printing

Bob decides to check his work by printing the leaflet. He chooses the **File** and **Print** menu options.

This displays the print dialogue box:



The dialogue box includes the following options:

- **All** or **From...To** prints all or a selected range of pages.
- **Copies** prints the specified number of copies.
- **Scale** sets the printing scale.
- **Upright** or **Sideways** prints upright (portrait) or sideways (landscape) on the page.
- **Draft** prints a draft version of the document using the native printer font, devoid of all formatting, effects, fonts and graphics. This is useful for copy-proofing.
- **Fit lots** fits more than one page on a sheet of paper.
- **Pause between pages** pauses the printing, giving you the option to **Continue** or **Stop** printing. This is useful if your printer doesn't have a sheet feeder.
- **Save** lets you saves your print choices with the document.
- **Cancel** removes the dialogue box from the screen without printing.
- **Print** starts the printing.

To save paper at this stage, Bob decides to print the leaflet at a scaled-down size as two A5 pages on a single A4 sheet of paper. (He intends to print the final version of the leaflet at its original A4 size and then to produce a double-sided leaflet on the photocopier).

To do this, he

- sets the **Scale** to **66** to define the printing scale for a page as 66%
- switches on **Sideways** to define the printing orientation
- clicks on **Fit lots** to fit more than one page on a sheet.

A number appears in brackets after the **Fit lots** option. This is the estimated number of pages that will print on a sheet of paper at the scale he has specified, in this case, 2. He clicks on **Print** to print the leaflet.

Personalised mailshots with mail merge

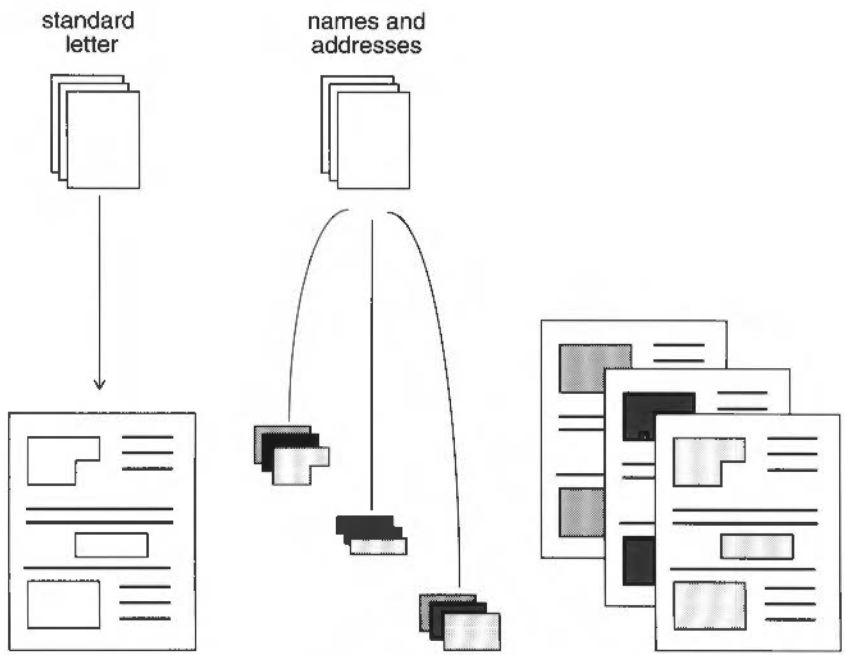
Bob has now completed his leaflet, and has checked it through. The final version is in the file `Leaflet4` in the `WPtutorial` directory on Data disc A.

He decides to send a copy of it to each of the shop's recent customers, along with a letter inviting them to the special Spring Sale preview.

The letter he wrote to Mr McCabe in the previous chapter would be ideal for this purpose, except that it was addressed to a particular individual. He could rewrite the letter so that it was not specific to an individual, beginning, for example, "Dear customer", but this would lack the personal touch on which Music Matters prides itself. Bob therefore decides to use the Word Processor's mail merge facility to create personal letters, addressed automatically to all Music Matters' recent customers.

What is mail merge?

Mail merge is a process which allows you to produce a series of documents which differ from each other only in minor detail. The classic use of this is to produce mailshots addressed individually to different people. You do this by combining two documents – a standard letter and a list of names and addresses – to produce an individual letter for each of the names on the list. You literally 'merge' them together.



The standard letter

The standard letter is a normal Advance Word Processor document, with codes entered wherever particular information has to be added. Here is a fragment of such a letter:

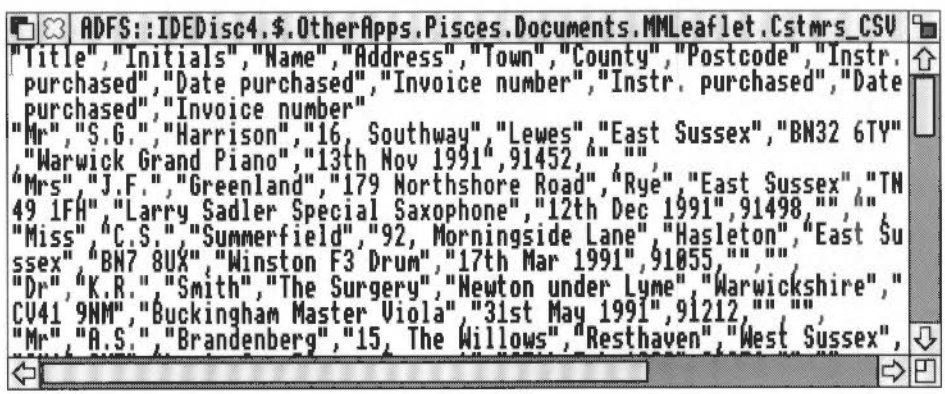
```
Dear <title> <name>,

First of all, I would like to thank you for your recent
```

The names and addresses

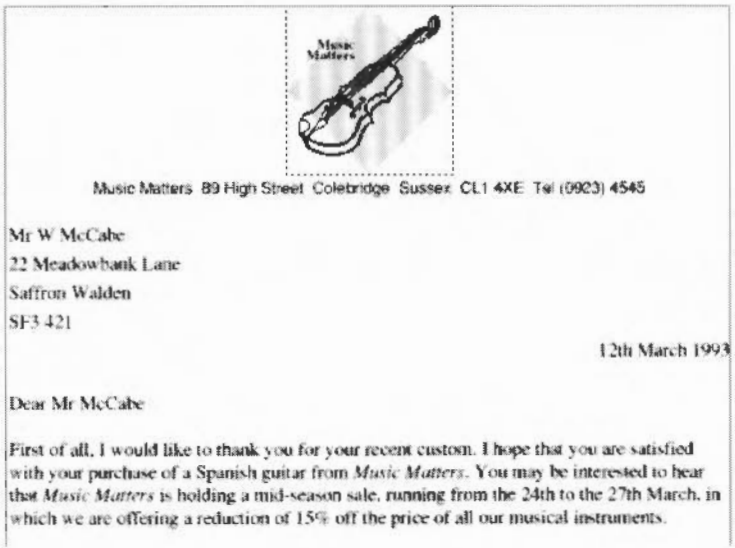
The names and addresses of the customers are imported into the standard letter from a CSV (Comma Separated Value) file. Like the TSV file Bob used in the previous chapter, a CSV file is a format in which information can be saved from Advance Spreadsheet or Advance Database. Commas separate information originally held in spreadsheet cells or database fields.

This is an example of a CSV file:



Creating a standard letter

Bob finds the letter he wrote to Mr McCabe, from which he is going to create his standard letter. He loads it onto his screen (this is in the file `LetterE`):



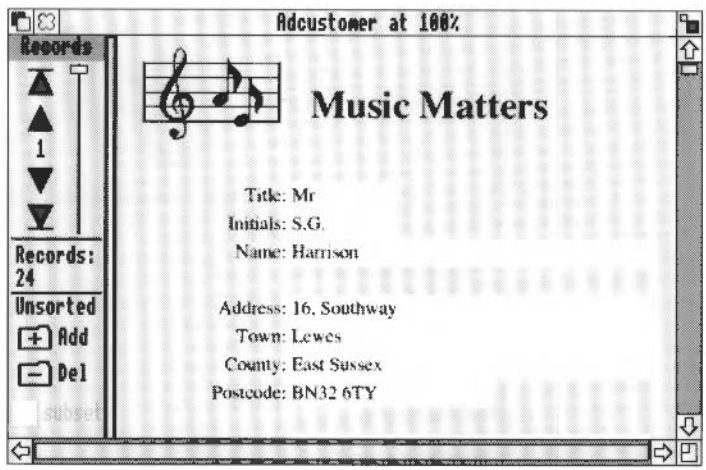
He decides which parts of the letter he wants to personalise for each customer:

- The title (Mrs, Mr, Dr etc)
- The initials
- The name
- The address
- The instrument they bought from Music Matters.

Bob knows that all this information is available, as it is kept on the Music Matters customer database.

Preparing a list of names and addresses

Bob makes a call to his Finance Manager, who tells him where to find the customer database on the company's Acorn Universal Network. He displays the Advance Database file on his screen (the file `Customers`):



This information will be used by mail merge in the form of a CSV (Comma Separated Value) file. So Bob saves the database file as a CSV file, omitting some of the fields which contain information he **doesn't** need, viz:

- the date the purchase was made
- the invoice number
- any other instrument purchased by the same person.

To do this, Bob 'unticks' the fields displayed in the **Save CSV/Fields** list, by clicking Adjust on them:

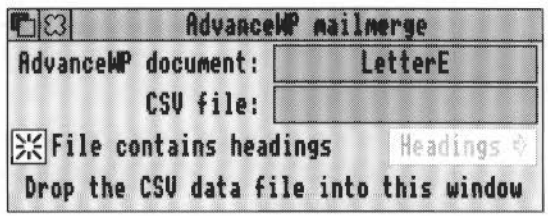
When he has specified which fields he wants to use in his mail merge, he saves the CSV file in the normal way to the same directory as his standard letter, and quits the database file (without saving it).

The CSV file is included in the `WPtutorial` directory on Data disc A, with the title `Cstmrs_CSV`.

Starting mail merge

Bob has what will become his standard letter ready, and his CSV file of names and addresses, so he is ready to start the mail merge.

He makes sure his printer is set up and ready, then opens his letter to Mr McCabe. He clicks inside the text frame, then chooses **Utilities/Start mail merge**. The mail merge dialogue box appears:

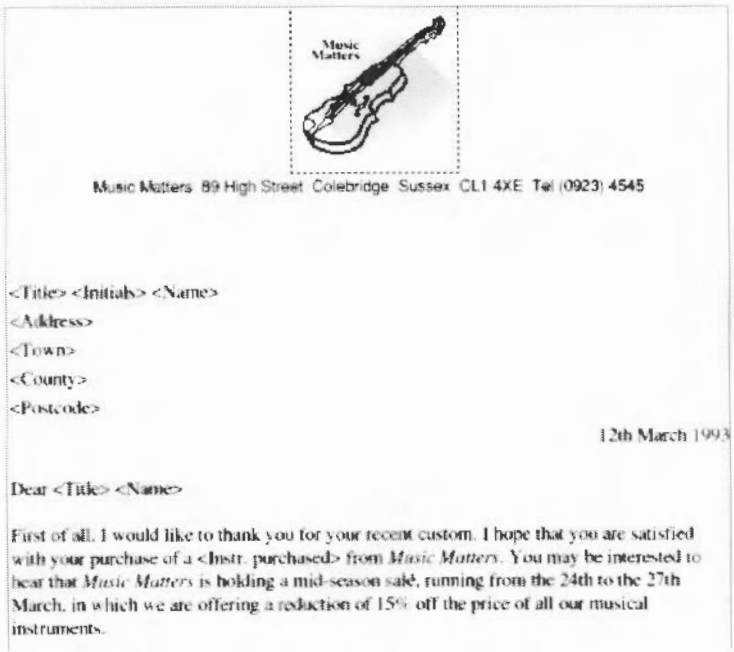


Bob drags the `Cstmrs_CSV` (his CSV file of names and addresses) file icon onto the dialogue box. The **Start merge** button appears, and the **Headings** option is no longer greyed out.

Clicking on **Headings**, he displays a list of the database field headings he saved from the customer database.

Taking each one in turn, so that he remembers what goes where, he deletes the details of Mr McCabe in his original letter, and substitutes them with the Headings in the list. He adds a line for the county, as the database includes county data.

For example, he goes to the letter and deletes 'Mr' from the address, leaving the cursor where 'Mr' used to be. He then clicks on **Title** in the **Headings** sub-menu. The formula <Title> will appear in the letter. He leaves a space, then goes on to delete 'W' and replace it by <Initials>, and so on, until the letter looks like this:

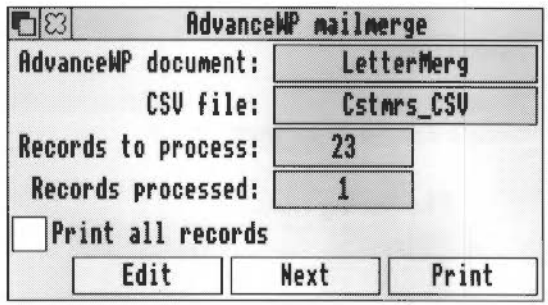


When he is ready, Bob saves his standard letter, giving it a name different from the original one he wrote to Mr McCabe. A copy of this letter is included in the `WPtutorial` directory on Data disc A, with the name `Lettermerg`.

He now checks the document's print options as he won't get another chance to change any settings once he starts the mail merge. He clicks on **File/Print**, makes sure that **All** and **Upright** are selected and then clicks on **Save**.

The next step is now to start merging the two files (the standard letter and the names and addresses in the CSV file).

He clicks on **Start merge**. The mail merge print dialogue box appears.



The first set of names and addresses is read into the standard letter – Bob checks that his entries make sense: he presses **Next** a few times to see how the letters will be printed. He pays particular attention to the instruments his customers have bought – he doesn't want to sent out a letter thanking any of them for a purchase of 'a drums', for example!

If he does find he needs to edit one of the letters, he can click on **Edit**. This halts the merge so he can edit the letter. He would then need to print it separately from the rest, and save it with a different file name, so as not to overwrite the original merge file.

When he is happy with his merged letters, he clicks on **Print all records**, then on **Print** to send all of them to his printer.

Warning: If you choose **Utilities/Start mail merge** and decide to add fields to your document, and then save it with a different name, the mail merge will refuse to run when you click on **Start merge**, denying that you have entered fields. If this occurs, close the mail merge dialogue box and choose **Utilities/Start mail merge** again, and it will use the new file name. Load the CSV file again and proceed as normal.

Extra features of Advance Word Processor

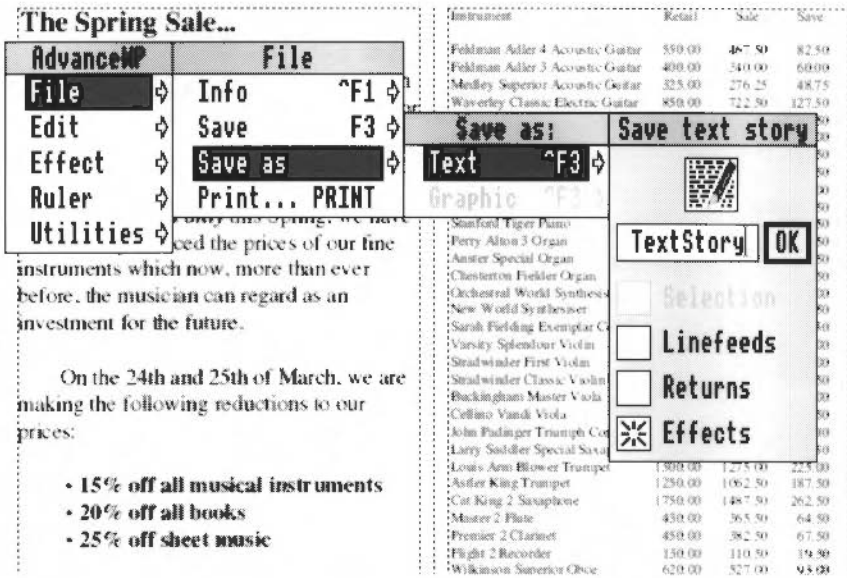
Bob has finished laying out his leaflet, and preparing a mailshot for it. In doing so he has used most of the features of Advance Word Processor. There are, however, some which he hasn't touched upon yet, and these are explained in the remaining pages of this chapter.

Exporting text and graphics

You can also **export** text and graphics from Advance Word Processor by saving a document as a plain text file and graphics as a Draw file. (For full details of Advance import and export facilities, see the chapter entitled *Moving data between Advance tools* on page 299.)

Saving text

To save a plain (ASCII) text file, click somewhere in the text (or select a block) and choose **File/Save as/Text**:



This allows you to save

- the current self-contained piece of text (the text of the document not including any header and footer text – click in the header first to save this specifically)
- by clicking on **Selection**, just the currently-selected block of text.

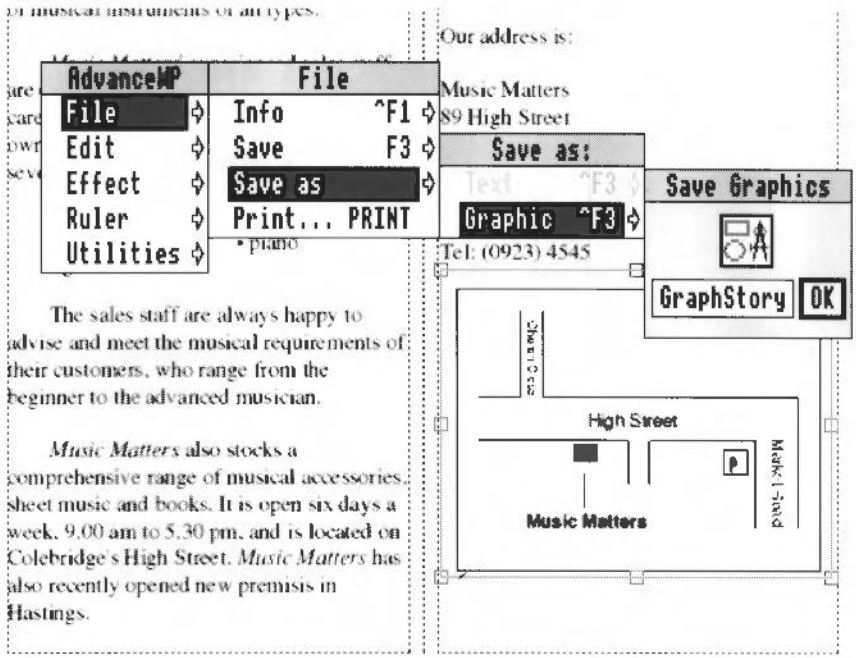
You can save the text

- with a linefeed (code 10) at the end of each line
- with a carriage return (code 13) at the end of each line
- with the Document Description Format (DDF) codes for **Effects**, such as bold, italic, font type, font size and ruler formats.

As a general rule, if you are going to use the text within Edit, choose only the **Linefeeds** option. If you wish to save the text in a form that is suitable for another word processor or desktop publishing package, turn off **Linefeeds**, **Returns** and **Effects**. This means that the Advance Word Processor saves only those returns that you have explicitly typed in the text. Alternatively, if you are sending text over an electronic mail system, choose the **Returns** option. To preserve the appearance of text that you have formatted, in case you will be re-importing it later into Advance Word Processor (or another program which understands DDF), choose **Effects**.

Saving graphics

Advance Word Processor saves graphics (including sprite files) as Draw files. For example, to save the Music Matters' map, select it then choose the **File/Save as/Graphic** option:



Save the map as a Draw file by dragging the Draw icon to one of your own directories.

Customising your environment

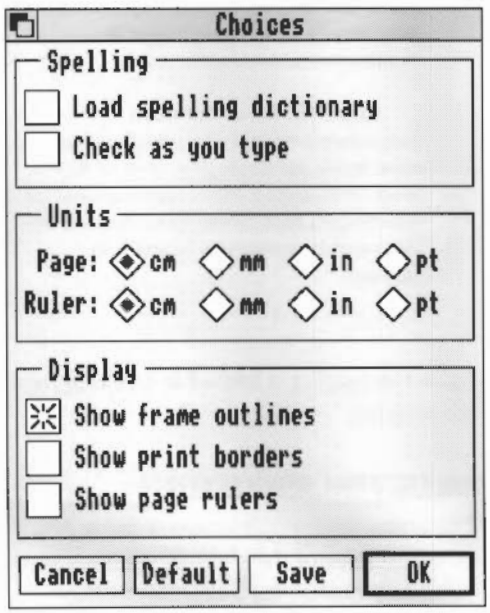
Once you have experience of using Advance Word Processor you may like to change some of the default settings so that you can start the Word Processor in your own customised environment.

Making your choices

You can establish a default appearance for your documents using the **Save default** option described in *Creating a new default document* on page 41.

You can also specify which features of the Word Processor you would like to run from the start of a session. To do this, display the Advance icon bar menu and click on **Choices...**.

This action displays the **Choices** dialogue box in which you can register your own preferences to use as defaults.



You can decide to

- load the spelling checker automatically (for details of the spelling checker, see *Checking the spelling* on page 70), and choose **Check as you type**
- set the page and ruler units (you can specify **cm, mm, in** and **pt**)
- show **frame outlines**, the **print border** and **page rulers**.

  (Note that you can also use the **Page rulers** option on the **Utilities** menu to toggle page rulers on and off within an individual document).

Once you have defined your preferences, you have the options

- to **Cancel** the settings
- to display the **Default** settings
- to **Save** your new settings for the future use
- to **OK** the settings for the duration of the session only.

Counting the number of words in your document

Information about the size and content of a document is available using the **File/Info** option.

To find out how many words there are in your document (excluding headers and footers), click in the main body of text and choose **File/Info**. If you click in a header or footer, the word count will display only the number of words in that header or footer.

Summing up

In this chapter you've learnt how to create a new Advance Word Processor document from scratch, with a multi-column layout, headers and footers. You've imported plain text, graphics and data from other Advance tools into the document, and used search and replace to edit text. You have checked the spelling and used mail merge to create mailshots to a number of customers.

You can now use Advance Word Processor to its full potential, but this is only the beginning. In this chapter you have glimpsed how the Word Processor can work with other Advance tools to provide integrated solutions to real problems; in the next chapter you will learn how to use another of these, Advance Spreadsheet, to record and analyse data.

6 Introducing the Spreadsheet

Advance Spreadsheet helps you set out and analyse all sorts of information. You can perform calculations and produce graphs of your results.

What is a spreadsheet?

Traditionally, spreadsheets were used to calculate financial statements. A spreadsheet was simply a large sheet of paper with rows and columns drawn on it. Numbers were hand-written into the rows and columns. Any calculations were made by hand, or with the help of an adding machine.

Nowadays, with a computer to do all the hard work, spreadsheets have become much more versatile. You still enter the information in rows and columns, but the computer automatically calculates and displays graphs of the results. It's simple to change either the information (data) used in calculations, or the calculations themselves.

You can exchange data between all the Advance tools. For example, you can produce a Spreadsheet file from information in an Advance Database, then plot a graph with Advance Graph or produce a report with Advance Word Processor.

Using Advance Spreadsheet

You can use Advance Spreadsheet for

- budgeting and cash-flow analysis
- recording and predicting results of experiments
- recording and assessing sporting or competitive events
- testing assumptions.

Once you've got a formula right, you can't make any mistakes in a calculation. If you change any figures, the spreadsheet automatically recalculates the result for you. The spreadsheet is always correct and up-to-date.

An Advance Spreadsheet can contain up to a maximum of 10000 cells, though in practice, the number of cells that can actually contain data will be restricted by the amount of memory in your computer.

You can have up to four different Advance Spreadsheets on screen at the same time. These spreadsheets can be interconnected; you can use data from one spreadsheet in another.

7 Getting started with the Spreadsheet

This chapter introduces you to some basic concepts. When you have finished it, you will have learnt enough to create your own Advance Spreadsheet and produce graphs.

This chapter takes you through the creation of a spreadsheet for our musical instrument shop, Music Matters. Jim Robinson, Music Matters' financial manager, wants to gauge how the shop is performing financially. He's never used Advance Spreadsheet before, so we'll follow his progress in constructing a spreadsheet.

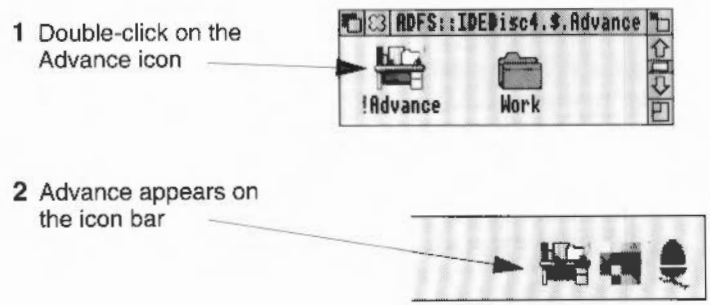
The best way to learn about Advance Spreadsheet yourself is to duplicate everything Jim does on your own computer. This way you will learn how to build a spreadsheet step by step. If you don't want to do this, but still want to look at the spreadsheet Jim creates, then you will find all his files on Data disc A (see *Help if you get lost, or want to save time* on page 90).

Music Matters is split into seven departments, each specialising in a type of instrument: Brass, Guitars, Keyboards, Percussion, Pianos, Strings and Woodwind.

Creating a new spreadsheet

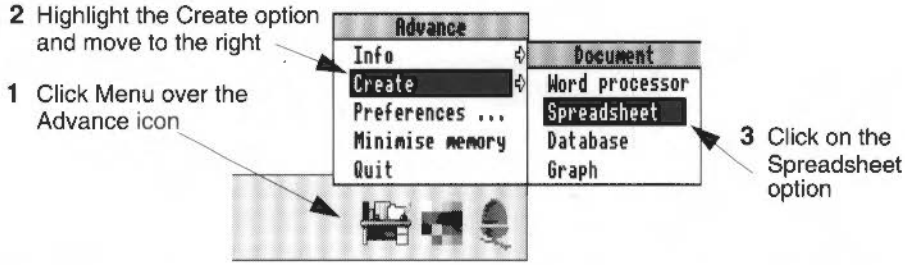
Loading Advance

To start using Advance Spreadsheet, Jim displays the directory containing the !Advance icon on the screen and then double-clicks on the Advance icon. This loads Advance onto the icon bar ready for use.

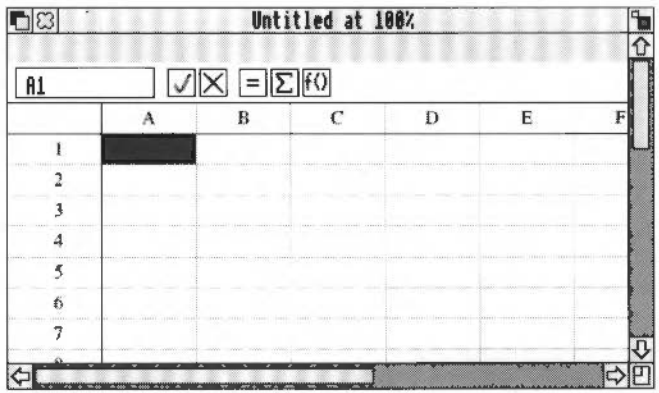


Creating a blank spreadsheet

Next, Jim wants to display a blank spreadsheet. He presses Menu (the middle mouse button) over Advance's icon on the icon bar and chooses the **Create/Spreadsheet** option.



This displays a blank spreadsheet into which he can begin entering text and data:



Don't worry about what all the different icons mean right now; they are explained as Jim gets to know Advance Spreadsheet in the rest of this chapter.

Help if you get lost, or want to save time

If you're following Jim's examples but don't want to have to type in everything Jim does, or if you get lost while trying to follow an example, look out for a symbol in the margin (like the one on the left).

These symbols point to files in the directory `SHtutorial` on Data disc A. Copy the file mentioned in the paragraph next to the symbol to your work disc. It shows you what Jim's spreadsheet will look like by the time he next saves it:

1. Insert Data disc A into the floppy disc drive, and click on the floppy drive icon.
2. Double-click on the `SHtutorial` directory.
3. Copy the file you want to your work disc and open it there.

It's best to use copies of the files on the Data disc. That way, you'll still have the originals to fall back on.

You can open any Advance file by double-clicking on it, as long as !Advance is already loaded (see *Loading Advance* on page 89) or the computer has at least seen a directory display containing the !Advance application.

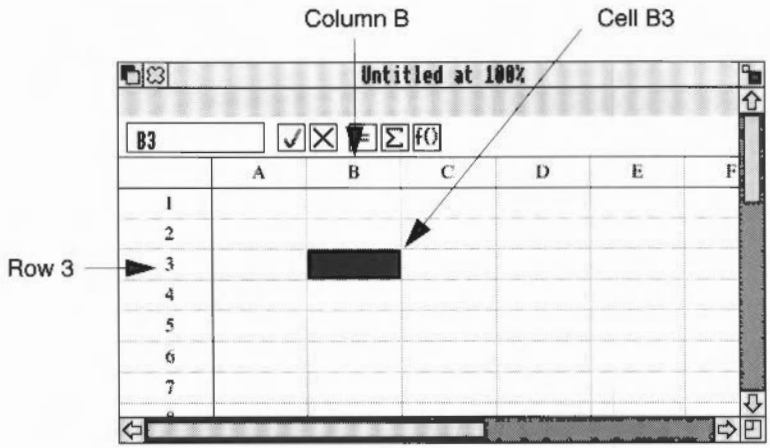
Starting out

Before you, and Jim, start using Advance Spreadsheet, here are some basics:

Rows, columns and cells

The spreadsheet table is arranged as a series of **rows** and **columns** where the rows are numbered 1, 2, 3 and so on, and the columns are lettered A, B, C ... Z (then AA, AB, AC...). These numbers and letters are the row and column **labels**.

A spreadsheet **cell** is the area where a column and a row intersect. Each individual cell has a name like B3 or C6, where the letter identifies the column and the number identifies the row. The top left cell in a spreadsheet is cell A1 (the cell where column A and row 1 intersect).



What can you put in Advance Spreadsheet?

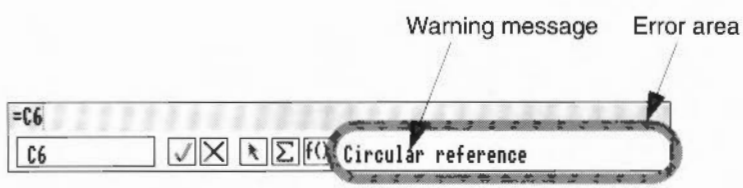
You can fill each cell with any one of three different kinds of information (or you can leave it empty):

- **text**; such as row or column headings, or a list of names or objects (like musical instruments!).
- **numbers**; numbers can be
  - integer (e.g. 247)
  - real (e.g. 247.32)
  - dates (e.g. 3rd Jan 1892)
  - times (e.g. 12:34:27pm).
- **formulæ**; these tell the computer how to calculate the value in a particular cell, using values from other cells. Formulæ obey the normal rules of algebra (see *Appendix E: Using expressions in Advance Spreadsheet* on page 323).

Help if you make a mistake – error messages

Messages in the Error area

Usually, when you enter something correctly, the Error area just says **OK**. However, if you type something into a spreadsheet that the computer can't understand (a **syntax** error, in computer-speak!) you'll often see a message in the Error area of the spreadsheet window:

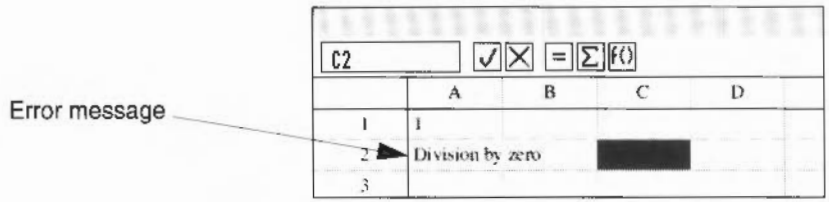


For example, the message above means that a cell is referring to itself (don't worry if you don't understand this yet – you'll learn all about cell references later in the chapter).

Messages also appear here if there is not enough memory available for the spreadsheet to be able to complete a large calculation.

Error messages in a cell

Sometimes you'll see error messages in cells themselves. These messages appear when the spreadsheet cannot calculate something you've entered because it is mathematically incorrect. An well-known example is if you try to divide a number by zero:



That's enough background information for the time being. Jim wants to get started on his spreadsheet now...

Entering data

Jim has created a blank spreadsheet. Now he is going to enter some sales figures into the spreadsheet.

- He wants to enter the sales figures from the previous six months.
- He'll add some estimates of his own – six months ago he estimated targets that each department needed to meet for the shop to remain profitable.
- Once he's done this, he'll be able to use the spreadsheet to decide how Music Matters is doing. Hopefully, his target figures will have been exceeded.

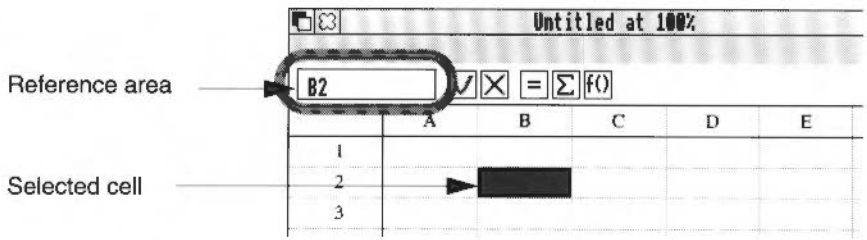
To start off, Jim wants to enter a title describing the spreadsheet. He's decided to have a heading "*Sales – by department*". He wants to put the heading on row 2, starting from cell B2 (he doesn't have to start at cell A1!).

The next section shows how Jim enters some text into spreadsheet cell B2.

Selecting a cell

1 Jim first clicks Select on cell B2. This *selects* the cell (it is highlighted on the screen).

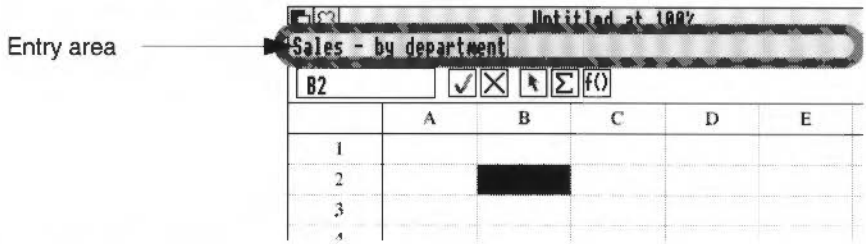
The name B2 appears as the selected cell at the top of the spreadsheet, in the **Reference area**.



2 Next, Jim types in the heading:

```
Sales - by department
```

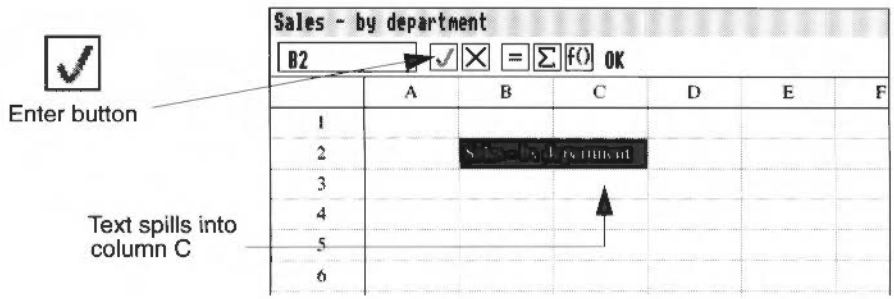
As he types, the text appears in the **Entry area** (the shaded area right at the top of the spreadsheet window):



(**Note**: If you make any mistakes while you're typing in data, use the Delete or Backspace keys to erase them. You can then type in corrections.)

Entering data with the Enter button

Jim clicks on the **Enter button** to enter the title into the spreadsheet cell B2 (he'll come across other ways of transferring what he's typed into a cell in *Entering data with Tab and Return* on page 95). You can see that as the text is longer than the cell it 'spills over' into the adjoining cell.



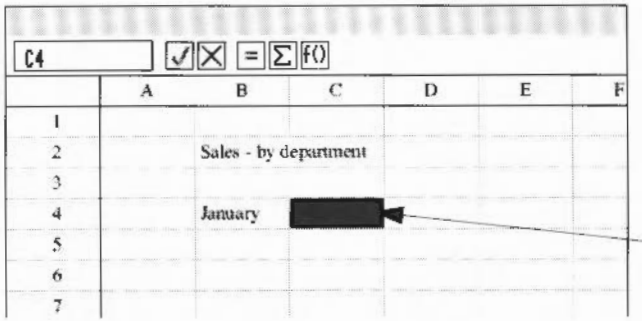
Entering data with Tab and Return

Now that the main heading is in place, Jim decides to put in the row and column headings. The spreadsheet will contain sales for the previous six months, so the month names January to June will be the column headings. The row headings will be the individual departments within the store.

Jim decides the results for January will go in column B, so he starts by entering the heading into cell B4:

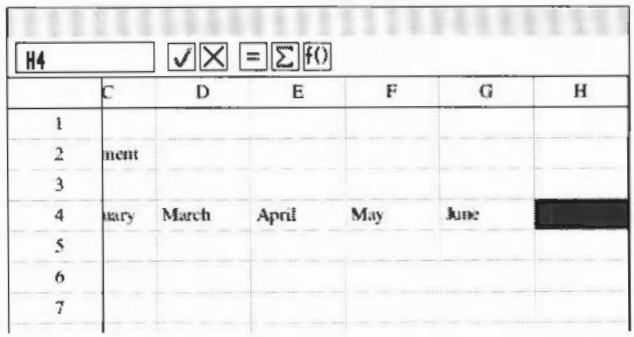
1 Jim selects cell B4 and types `January`.

2 Next, he presses **Tab** on the keyboard. This transfers the data into the spreadsheet and then automatically selects the next cell to the right.



3 He repeats the process with cell C4 (which is now selected) by typing `February` then pressing Tab.

4 Jim continues by entering month headings for March to June, pressing Tab after each month.



Here's what the spreadsheet looks like when the month names are entered.

The body of the spreadsheet has scrolled left: Jim can now see column H.

Jim sees that the spreadsheet moves inside the window to show more columns to the right as he enters the month names.

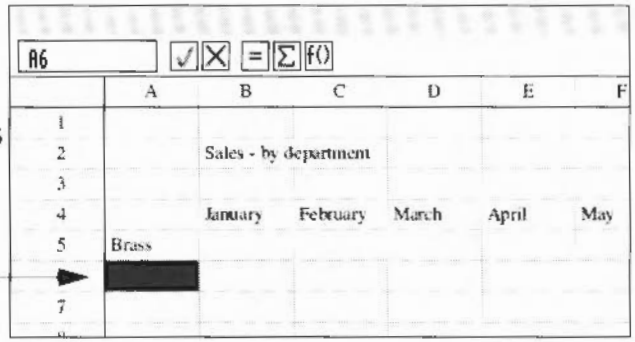
Now Jim wants to enter the department names.

1 First, he drags the horizontal scroll bar to the left until he can see column A again.

2 Next he selects cell A5 and types `Brass`.

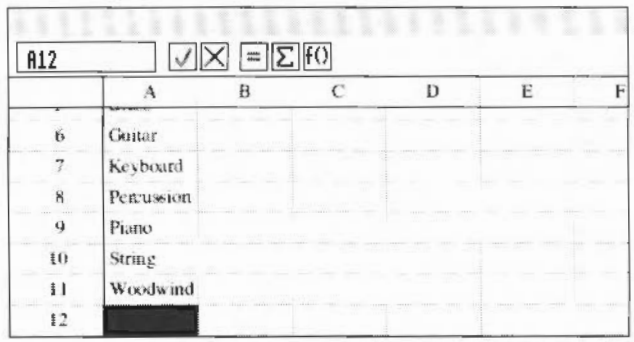
3 Then he presses **Return** – this transfers what he typed into cell A5 and then highlights the cell **below** (cell A6).

Jim enters text in cell A5 then presses Return – cell A6 is highlighted



Jim repeats the process, and types in the headings for the rest of the departments: Guitar, Keyboard, Percussion, Piano, String and Woodwind. He ends up with the department names in cells A5 to A11:

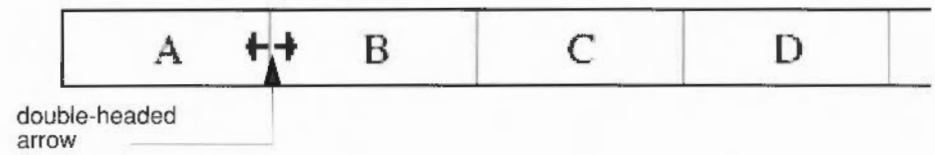
Notice that the contents of the window scroll so that the selected cell stays visible when Jim presses Return.



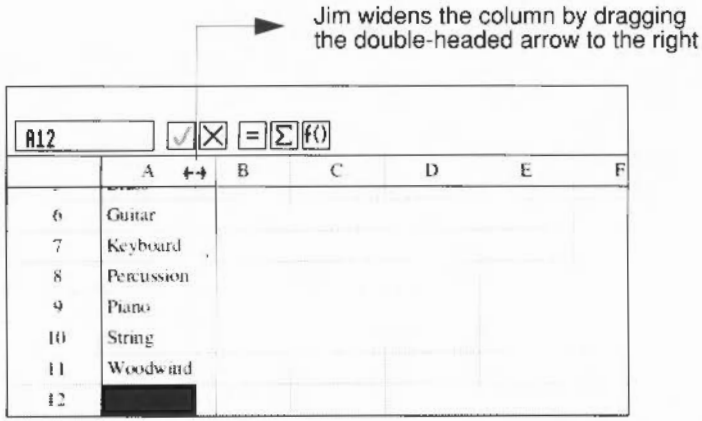
Widening a column

At the moment, the cells are all the same width in Jim's spreadsheet. Jim decides to widen all the cells in column A slightly:

1 First, Jim positions the pointer over the vertical line between headers of column A and column B. The pointer changes to a double-headed arrow.



2 Next, he holds down Select and drags the column divider to the right. The column width changes size. He releases Select when column A is wide enough so that the word Woodwind doesn't look so cramped.



Note: Another way to get the right column width is to double-click on the column label (e.g. the letter A at the top of column A). The column then changes width to fit the widest item.

You can apply both these methods to change the height of rows, too.

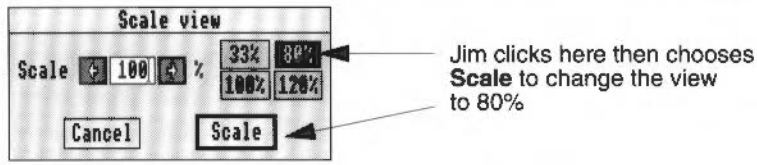
Scaling the size of a spreadsheet on the screen

Jim wants to be able to fit more of his spreadsheet on the screen, so he can see everything he's typed in so far. He wants to zoom out so that he's looking at the spreadsheet at 80% of its actual size:

1 He chooses the **Utilities/Scale view** option to display the Scale view dialogue box.

(He could have pressed F11 – the short-cut for displaying the Scale view dialogue box. See *Using menu short-cuts* on page 126 for more on short-cuts).

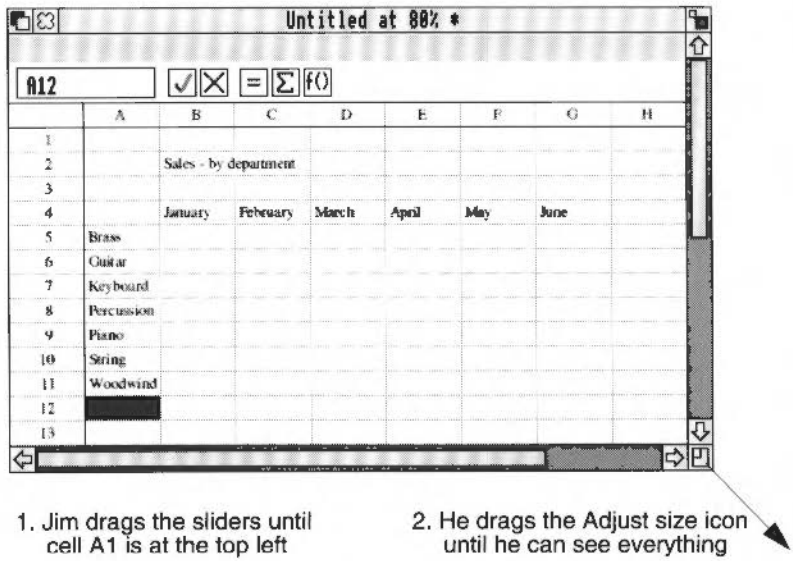
2 He clicks on the **80%** default box (there are four defaults) then clicks on **Scale**.



The view of his spreadsheet changes so that it is displayed at 80%.

Note: If you don't want to use any of the four default scale factors, you can supply your own. Type a value in the Scale box, or click on the arrows to alter the scale factor. You can choose any factor from 25% up to 200%, in whole number steps.

Jim uses the Scroll bar sliders and the adjust size icon so that he can see everything he's entered so far:



Saving a spreadsheet

Jim decides that now would be a good time to save the work he's done so far.

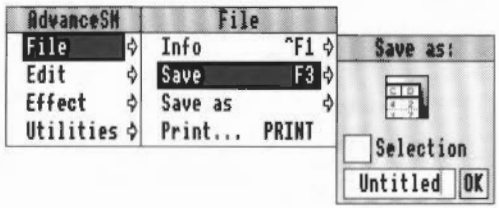
Note: If a spreadsheet has any unsaved changes in it, an asterisk appears to the right of the document name in the title bar. This reminds you that you have some work unsaved.

Asterisk indicates that the spreadsheet needs saving.

To save his spreadsheet file for the first time:

1 Jim opens the directory in which he wants to save his spreadsheet.

2 He chooses the **File/Save** option to display the **Save as** dialogue box.



3 He presses Ctrl-U to delete the whole default name in one go, then types in the new name for his spreadsheet. Jim calls his sheet `MonthSales` – call yours something else so you don't get confused!

4 He drags the icon in the Save as box to the directory window.

5 The document icon appears in the directory window when it has been saved.

Entering some numbers

Now that Jim Robinson has completed the outline of his spreadsheet, he wants to start entering some figures. The Brass sales figure for January will go into B5, the Guitar sales figure for February in C6 and so on.

If you're following Jim's example but you don't want to enter all the sales figures by hand, copy the file `Jim_1` to your work disc and open it. It's in the `SHtutorial` directory on Data disc A.

Here are the numbers Jim is going to enter:

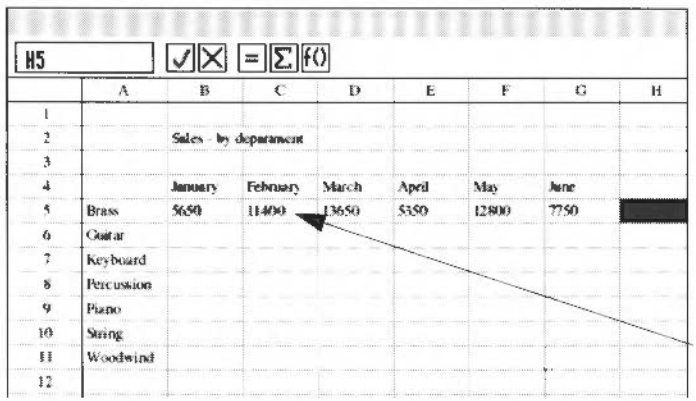
	January	February	March	April	May	June
Brass	5650	11500	13650	5350	12800	7750
Guitar	5025	7800	7825	11650	6475	7700
Keyboard	4200	2600	8000	9450	8250	5300
Percussion	2050	2000	2025	3225	750	2600
Piano	1890	3000	5430	4640	1890	1350
String	5500	4000	1250	4250	1250	7500
Woodwind	2220	1580	1390	1100	1960	1190

To enter numbers in his spreadsheet, Jim uses the same method as for headings:

1 Jim first selects cell B5 by clicking on it. The cell name B5 appears in the Reference window.

2 Next, he types in 5650 (January's sales figure for the Brass department) and presses Tab. The number 5650 is now displayed in cell B5.

3 Jim goes on to enter the figures for February to June for the Brass department, pressing Tab after he's typed in each number.

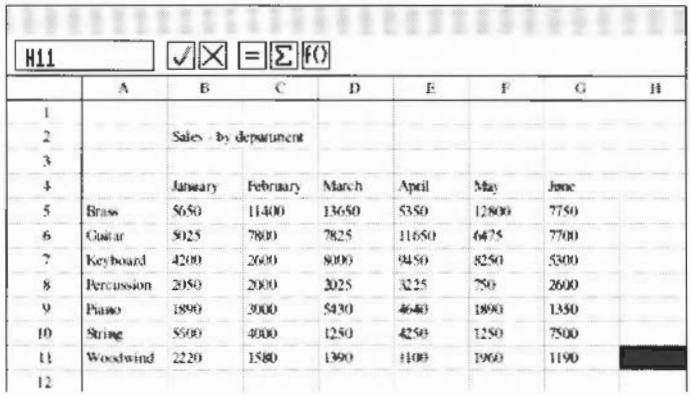


Next, Jim enters the sales figures for the Guitar department:

4 He presses the Down arrow cursor key once (cell H6 is selected) then presses the Left arrow cursor key six times until cell B6 is selected.

5 He types in figures for January to June for the Guitar department, pressing Tab to enter each one.

6 Jim fills in the rest of the figures for the remaining departments using the Tab and Return keys to move around the spreadsheet. His spreadsheet looks like this:



H11

	A	B	C	D	E	F	G	H
1								
2		Sales - by department						
3								
4		January	February	March	April	May	June	
5	Brass	5650	11400	13650	5350	12800	7750	
6	Guitar	8025	7800	7825	11650	6675	7700	
7	Keyboard	4200	2600	8000	9850	8250	5300	
8	Percussion	2050	2000	2025	3225	750	2600	
9	Piano	1890	3000	5430	4640	1890	1350	
10	String	5500	4000	1250	4250	1250	7500	
11	Woodwind	2220	1580	1360	1100	1960	1190	
12								

Saving an existing file

Jim reckons he ought to save the spreadsheet again now. As he's already saved the spreadsheet once, and it has a name, all he has to do is press F3 followed by Return. (Another way is just to choose **File/Save**.)

Using a formula

Now that Jim has entered the sales figures, he wants to start using the data to provide him with information about Music Matters' sales performance during the last six months.

This is what Jim wants to find out from these figures:

- the average sales for each department
- the average sales for each month
- the overall average sales for the half-year (the average figure for each department each month).

He'll work out each average using a **formula**.

Jim wants to analyse these results to find out how the shop is doing and to see which of the departments is performing well.

How to find an average

As you know, you can find the average of four numbers by adding them up and dividing by four. If the four numbers are called b, c, d and e, you can express this as:

```
(b+c+d+e)/4
```

The "/" means division. The brackets are a convention which means 'do the calculation in the brackets before performing the division'.

In Jim's spreadsheet, the Brass department's sales figures are held in cells B5, C5, D5, E5, F5 and G5, so the formula for the average sales would be:

```
(B5+C5+D5+E5+F5+G5)/6
```

Using Edit mode to enter a simple formula

Open the file `Jim_2` (on Data disc A) now if you want to see what Jim's spreadsheet looks like after he's calculated all the departments' monthly averages.

To find out the Brass department's monthly average:

1 Jim selects cell H5. That's where he's going to put the average monthly sales result.

2 He clicks on the **Edit mode** button. This puts an = sign at the start of the Entry area, telling the spreadsheet that whatever follows is a formula, not just data.

Notice that the Edit mode button's icon has changed to a pointer, indicating that the spreadsheet is in **Edit mode**.

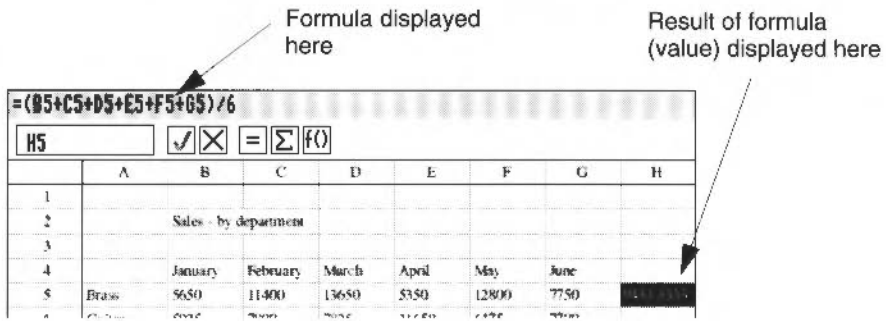
3 After the = sign, he types in the formula for the Brass department's average:
`(B5+C5+D5+E5+F5+G5)/6`
The Entry area looks like this:

4 Now Jim clicks on the Enter button. This enters the formula into cell H5.

Jim can now see that the average monthly sales for the Brass department has been put into cell H5. No need to get out his calculator – Advance Spreadsheet has done it for him. What he did was tell the computer to add up the numbers in B5 to G5 and divide the result by six. What he's just typed in is known as a formula.

The formula in cell H5 links the cell with B5, C5, D5, E5, F5 and G5. Whenever the number in any one of these cells is changed, the new average is immediately calculated and displayed in H5.

This illustrates one of the most fundamental features of a spreadsheet. Each cell can hold a formula and a **value**:



Another way of getting into Edit mode

Now Jim types in the formulæ for the rest of the row averages. For example, he wants the Guitar department's average to be displayed in cell H6, so he selects cell H6 and types in the averaging formula:

`=(B6+C6+D6+E6+F6+G6)/6` and presses Return.

Notice this time that instead of clicking on the Edit mode button, Jim just started typing. The spreadsheet went into Edit mode automatically.

There are more ways of getting into Edit mode. See *Other ways of getting into Edit mode* on page 154.

This is what the spreadsheet looks like when all the row averages have been calculated.

H12

	A	B	C	D	E	F	G	H
1								
2		Sales - by department						
3								
4		January	February	March	April	May	June	
5	Brass	5650	11400	13650	5350	12800	7750	9433.3333
6	Guitar	5025	7800	7825	11650	6475	7700	7745.8333
7	Keyboard	4200	2600	8000	9450	8250	5300	6300
8	Percussion	2050	2000	2025	3225	750	2600	2108.3333
9	Piano	1890	3000	5430	4640	1890	1350	3033.3333
10	String	5930	8000	1250	4250	1250	7500	3958.3333
11	Woodwind	2220	1580	1390	1100	1960	1390	1573.3333
12								
13								

Jim saves the spreadsheet again now: he presses F3 followed by Return.

Using a function

Jim Robinson managed to finish putting in the row averages but he thought that typing in a long formula was rather tedious and prone to mistakes. He was right. There is an easier way of calculating averages and Jim is going to use it to calculate the column averages.

To find the average sales for each month, Jim averages each column using a formula, just as he did for each row average. However, to speed up the process, this time he can use one of Advance Spreadsheet's standard functions.

For example, the calculation (B5 + B6 + B7 + B8 + B9 + B10 + B11)/7 could be typed in as

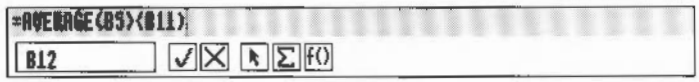
```
=AVERAGE(B5><B11)
```

where AVERAGE is the function, and B5><B11 means the contents of the cells in the block B5 to B11 inclusive.

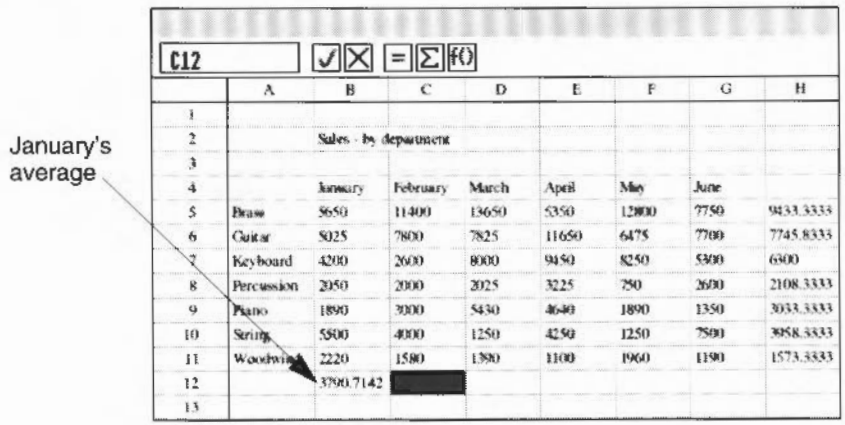
This is how Jim finds Music Matters' average sales for each department in January:

1 First, he selects cell B12.

2 He then clicks on the Edit mode button and types in the formula:



3 Finally, he presses Tab. The result appears in cell B12.



Repeating (copying) a formula

Jim's already typed in the formula for January's average, but doesn't want to have to do it all again five more times. He can copy the formula in cell B12 into the cells C12 to G12 to calculate the averages for February to June.

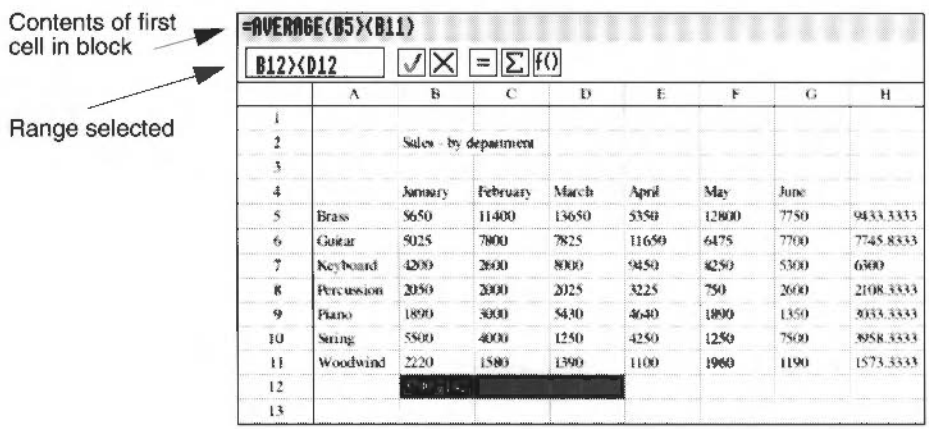
Open the file `Jim_3` (on Data disc A) now if you want to see what the spreadsheet looks like when Jim has calculated all the monthly averages.

Selecting a block of cells

In this case, Jim can use a very quick way of copying a formula into a whole block of cells. This is because the block he wants to copy the formula into (cells C12 to G12) is right next to the cell already containing the formula (B12).

1. Jim moves the pointer over cell B12.
2. He holds down Select and drags the pointer along row 12 until all the cells B12 to D12 are highlighted. (Notice he's not dragged far enough! He'll correct this in a minute.)
3. He releases Select.

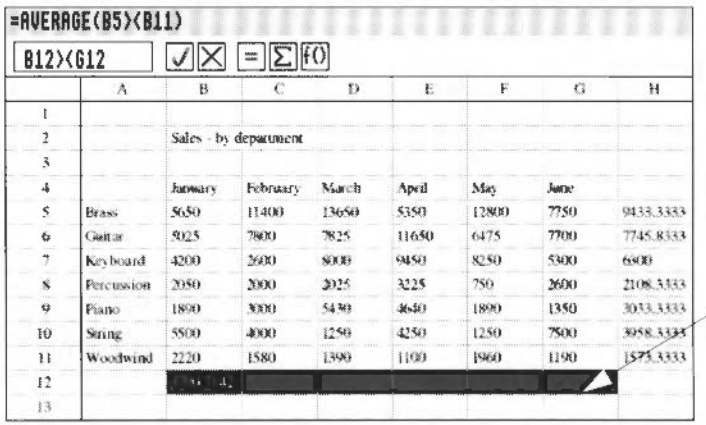
The block of cells B12 to D12 is now selected. The Entry area shows the contents of the first cell in the block, and the Reference area shows the range of cells selected:



Changing the size of a selected block

Jim wants to alter the size of the block he's selected.

He clicks Adjust on cell G12. The Reference area now shows B12><G12.



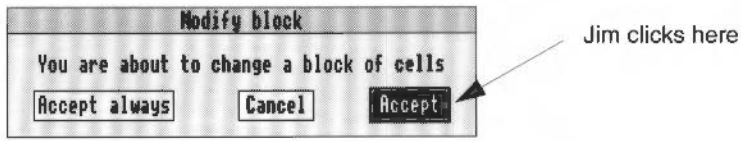
Note: You can alter the size of a block by clicking Adjust on a cell anywhere within the spreadsheet grid.

Copying a formula

This is how Jim copies the formula into all the cells in the selected block:

1 He clicks on the Enter button.

2 He clicks on the **Accept** button when he sees the following message:



Note: If Jim had instead clicked on **Accept always**, it would have stopped the message appearing next time he changed a block (and on every subsequent change). However, it's a good idea, while he's still getting used to the spreadsheet, to have the message displayed every time. It could save him from making a mistake.

Advance Spreadsheet fills in the cells B12 to G12 with the same formula. This is what the spreadsheet looks like when all the monthly averages have been calculated:

H13 ✓ ✗ = Σ f() OK

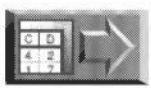
	A	B	C	D	E	F	G	H
1								
2		Sales - by department						
3								
4		January	February	March	April	May	June	
5	Brass	5050	11400	13650	5550	12800	7750	9833.3333
6	Guitar	9025	7800	7825	11650	6475	7700	7745.8333
7	Keyboard	4200	2600	8000	9450	8250	5800	6900
8	Percussion	2050	2000	2025	3225	750	2600	2108.3333
9	Piano	1890	3000	5430	4680	1890	1350	3033.3333
10	String	5500	4000	1250	4250	1250	7500	3958.3333
11	Woodwind	2220	1580	1390	1100	1960	1190	1573.3333
12		3790.7142	4625.7142	5652.8571	5666.4285	4767.8571	4770	
13								

This is where Advance Spreadsheet does something clever. Jim clicks on the cells B12 to G12 in turn and looks at the Entry area. He sees that the formula changes to reflect the new column names. The formula has been copied and **adjusted for position**. This means, for example, that the formula in cell H7 refers to other cells in row 7, whereas the formula in cell H11 refers to cells in row 11. The formulæ all refer to cells in the same **relative** positions.

Jim saves his file again.

Using the Function button

Jim wants to calculate one more average – the half-yearly average. This is the average of all the figures in cells B5 to G11.



Open the file `Jim_4` (on Data disc A) now if you want to see what the spreadsheet looks like when Jim has calculated the half-yearly average.

Jim uses some more of Advance Spreadsheet's special features to help him enter the formula quickly:

1. He first highlights cell E14 and types in the text label `Overall Average` and clicks on the Enter button.
2. Then, he highlights cell G14. This is where he wants the overall average to appear.

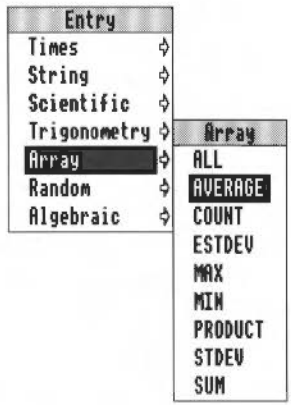
3 Next, he clicks on the Function button (**f()**). This brings up a menu of standard functions that Advance Spreadsheet supplies.

Notice that the pointer changes shape when Jim moves it over the Function button:

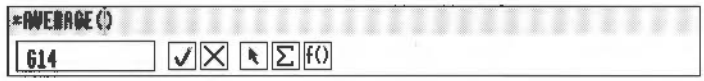
Function button

pointer changes shape

4 He chooses the **Array/AVERAGE** option:

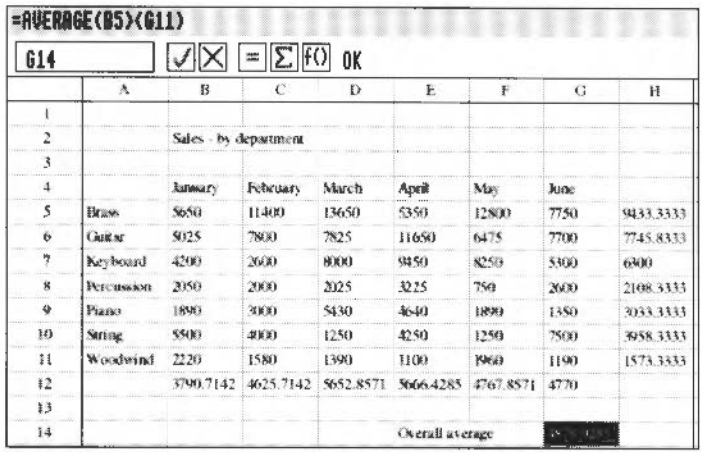


An 'empty' function appears in the entry area, ready for Jim to fill in the range of cells he wants to average. The cursor is placed ready between the brackets:



5 Jim types `B5><G11`.

6 Finally, he clicks on the Enter button. The average appears in cell G14:



	A	B	C	D	E	F	G	H
1								
2		Sales - by department						
3								
4		January	February	March	April	May	June	
5	Brass	5650	11400	13650	5350	12800	7750	9433.3333
6	Guitar	5025	7800	7825	11650	6475	7700	7745.8333
7	Keyboard	4200	2600	8000	9450	8250	5300	6400
8	Percussion	2050	2000	2025	3225	750	2600	2108.3333
9	Piano	1890	3000	5430	4640	1899	1350	3033.3333
10	String	5500	4000	1250	4250	1250	7500	3958.3333
11	Woodwind	2220	1580	1390	1100	1960	1190	1573.3333
12		3790.7142	4625.7142	5652.8571	5666.4285	4767.8571	4770	
13								
14					Overall average			

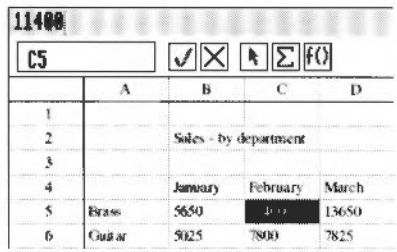
7 Jim saves his work again now, by pressing F3 then Return.

Changing (editing) data in cells

Jim's just about finished his spreadsheet, but he spots a mistake in the February sales for the Brass department: it wasn't 11400 but 11500. This is how he changes the figures:

1 First, he double-clicks on the cell containing the wrong data (C7). The number 11400 is displayed in the Entry area.

The Edit mode button's icon changes to an arrow, indicating Edit mode, and the caret appears at the end of the Entry area:

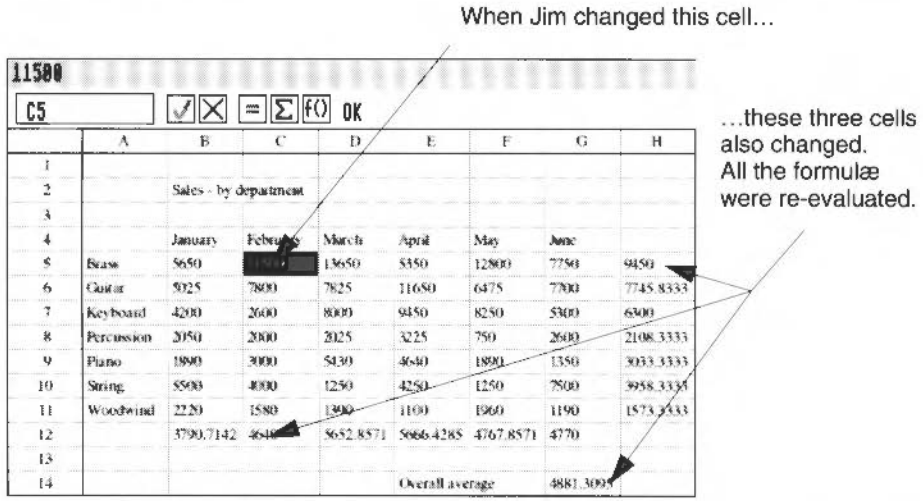


	A	B	C	D
1				
2		Sales - by department		
3				
4		January	February	March
5	Brass	5650	[redacted]	13650
6	Guitar	5025	7800	7825

2 He presses delete three times and types in 500, then clicks on the Enter button.

The Edit mode button's icon changes back to an = sign, and 11500 appears in cell C5.

See how the three averages affected by the change in the figures have automatically changed to reflect the altered figure. Whenever any cell is changed, all affected cells are recalculated.



Note: If a cell contains a long formula that you want to delete, you can click on the **Cancel button** to erase the whole formula, rather than holding down Delete. You can then enter your new formula.

At this point, Jim wants to add a couple more headings to his spreadsheet, to make it clear which averages are which:

1. He enters the text `Dept. averages` in cell H4.
2. He enters the text `Monthly averages` in cell A12.
3. For good measure, he enters the text `Dept.` in cell A4 (to give the column containing the department names a title).
4. He double-clicks on column A's label, to make the column width the right size, then saves his sheet again:

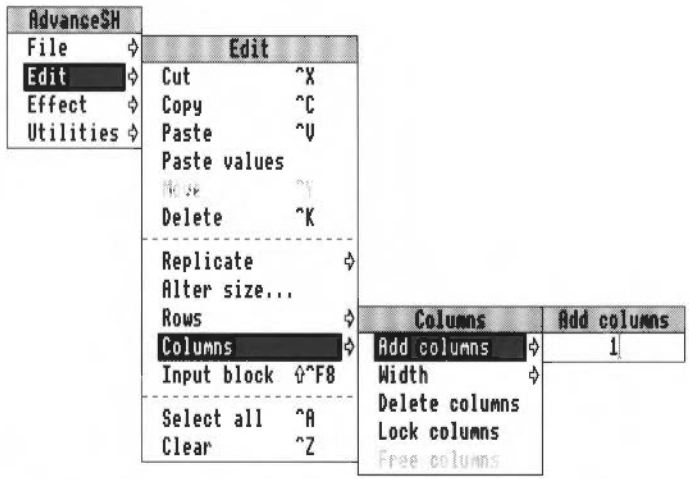
	Sales - by department						
Dept.	January	February	March	April	May	June	Dept. averages
Brass	5650	11500	13650	5350	12800	7750	9450
Guitar	9025	7800	7825	11650	6475	7700	7745.8333
Keyboard	4200	2600	8000	9850	8250	5300	6300
Percussion	2050	2000	2025	3225	750	2600	2108.3333
Piano	1890	3000	5430	4640	1890	1350	3033.3333
String	5500	4000	1250	4250	1250	7500	3958.3333
Woodwind	2220	1580	1390	1100	1960	1190	1573.3333
Monthly averages	3790.7142	4640	5652.8571	5666.4285	4767.8571	4770	
				Overall average		4881.3095	

Adding rows and columns

In the next section Jim's going to include some more figures in his spreadsheet. He'll need some more room to do this, so first he adds some more columns:

1 First of all, he selects cell J2.

2 Next, he uses the **Edit/Columns/Add columns** option to display the **Add columns** dialogue box.



3 He presses Delete once, types in 7, and presses Return.

The total number of columns in the spreadsheet increases to 17. The extra columns are added **after** the column containing the selected cell (column J).

Note: You can use this method to add or delete rows **or** columns. For another way, see *Changing the overall dimensions of a spreadsheet* on page 160.

Importing data into a spreadsheet

Now Jim has typed in the sales figures for the last six months, he wants to compare those figures with some target sales figures that he calculated six months ago. He can then get an idea of how the company is performing.

When Jim calculated the target figures, he typed them into a special type of file (a CSV file) called `JimsData` (there's a description of CSV files in *CSV and TSV files* on page 183). Jim doesn't want to have to type the figures again to get them into the spreadsheet. Luckily, there's an easy way to copy the CSV file into his existing spreadsheet.

Open the file `Jim_5` (on Data disc A) now if you want to see what the spreadsheet looks like after Jim has imported the file `JimsData`.

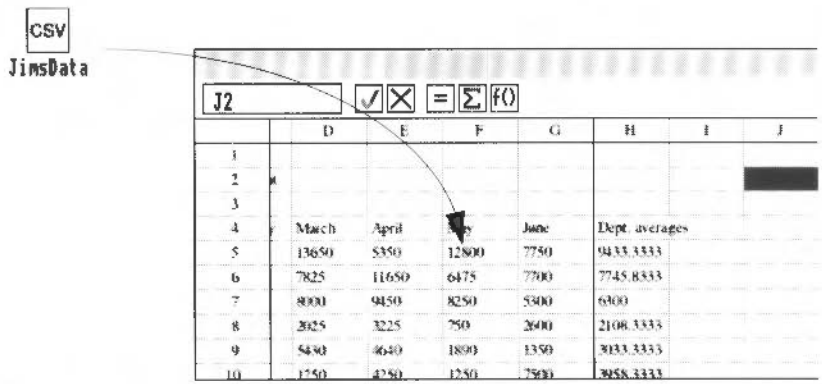
Importing a CSV file

This is how Jim imports the file `JimsData` (there's a copy of this file on Data disc A, in the `SHtutorial` directory):

1 First, Jim opens the directory containing his sales targets file, `JimsData`.

2 Jim then makes sure that cell J2 is selected in his spreadsheet.

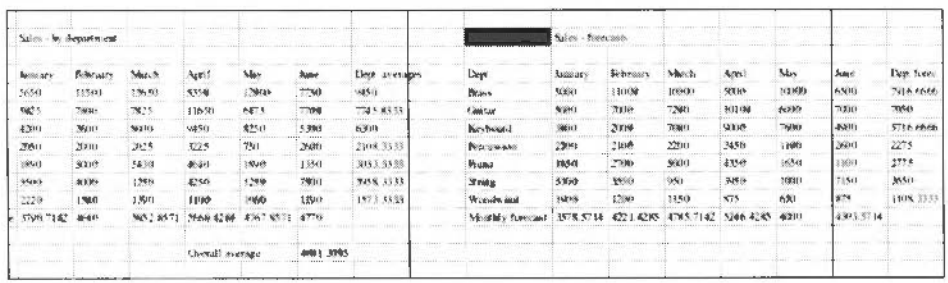
3 Next, he drags the `JimsData` icon over the spreadsheet's window.:



The data contained in the file JimsData now appears in the spreadsheet. It looks similar to the existing sales data, but the figures are different.

4 Jim double-clicks on the label for column J.

5 Jim scales the size of the window to 60% (by pressing F11) so he can see as much of the spreadsheet as possible:



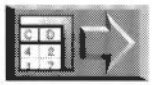
6 Finally, Jim saves the spreadsheet.

Now Jim looks over both sets of figures. He can see that his targets were quite reasonable, and have been met pretty easily (with a couple of exceptions). Indeed, it looks as though Music Matters should make a profit.

See *Getting data in and out of a spreadsheet* (*importing and exporting*) on page 183 for more information on CSV files.

Entering cell or block references with the mouse

Jim wants to calculate the difference between the total sales from the previous six months and his total target sales. He wants to place the result in cell P14.



Open the file `Jim_6` (on Data disc A) now if you want to see what the spreadsheet looks like after Jim has calculated this difference.

The formula he needs is `sum(B5><G11)-sum(K5><P11)`:

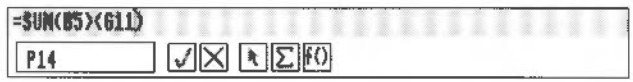
1 He selects cell O14, enters the heading `Difference`, then presses Tab.

2 He selects cell P14. This is where he'll put the result.

3 He clicks on the Summation button.

4 He drags the scroll bars until he can see cell B5 in the window.

5 Holding down Select, he drags the pointer from cell B5 to cell G11. As he drags, the block is highlighted in light grey (cell P14 remains highlighted in black). So far, the Entry area looks like this:

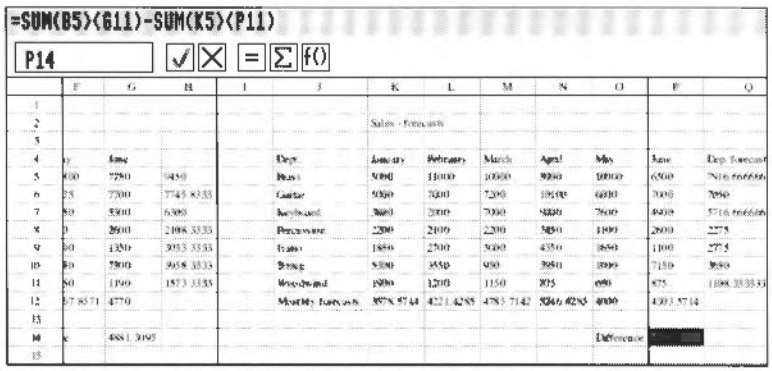


6 He presses the right cursor arrow once, to move the caret to the right of the bracket, then types a minus sign (−).

7 Now he clicks on the Summation button again.

8 Next he scrolls until he can see cell K5, and selects block K5 to P11 by dragging the pointer. When he drags beyond the window border, the spreadsheet scrolls automatically to reveal more cells (see the next section for more on this).

9 He clicks on the Enter button. The result now appears in cell P14:



10 Finally, he saves his spreadsheet.

Note: Usually, you can only select one block at any time. The exception is when you are defining a block as part of a formula, as above.

Extending a block beyond the window borders

Here's a bit more information on selecting blocks. You don't need to copy Jim's actions; just remember the techniques for when you need them.

In the last section, Jim couldn't always see all the cells in the block he wanted to highlight – they lay beyond the window borders. There are two ways Jim dealt with this:

Dragging the pointer – When the pointer reached the window border, Jim just continued to drag the pointer in the direction in which he wanted to extend the block. The spreadsheet moved in the window, displaying more cells. If you are defining a block as part of a formula, you must use this method to select the block.

Using Adjust – Jim selected the first cell in the block. He then dragged the scroll bars until he could see the cell at the end of the block and clicked on it with Adjust. Note that you cannot use this method if you are defining a block as part of a formula.

Displaying results as a graph

Jim Robinson's satisfied with his work; he's looked at the figures and is sure that Music Matters' financial situation is pretty healthy. However, he has yet to convince his fellow directors, especially Bob Davies. Jim decides that the best approach would be to show them the spreadsheet and a graph of the results.

Jim knows that Bob will probably understand the spreadsheet, but thinks that a graph will not only look impressive but will also convey the information well.

If you want to know more about plotting graphs from the spreadsheet, see *More on graphs* on page 189. If you want to find out more about the Graph tool itself, see the chapter entitled *The Graph tool* on page 273.

Special note for 1MB computer users

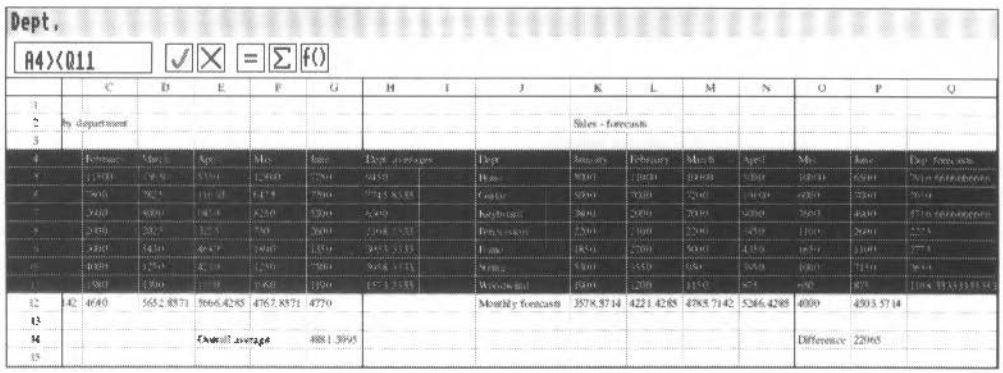
If you are using a 1MB computer, you won't be able to load the Spreadsheet and Graph tools at the same time. Read this section to see how the Graph tool works, but before you try to plot a graph see *Saving data in Graph file format* on page 185 and *Appendix B: Using Advance on 1MB or 2MB computers* on page 303. This tells you how to save your spreadsheet data to a file that the Graph tool can understand. You can then quit the Spreadsheet tool, start the Graph tool, and plot your graph.

Selecting which data to display as a graph

Jim's graph is going to have two lines: one for the actual sales averages (from column H) and one for the forecast averages (from column Q). The headings for the X axis will be the department names (from column A).

1 Jim makes sure his spreadsheet MonthSales is open.

2 He selects the block A4><Q11:



Sending row or column data to the Graph tool

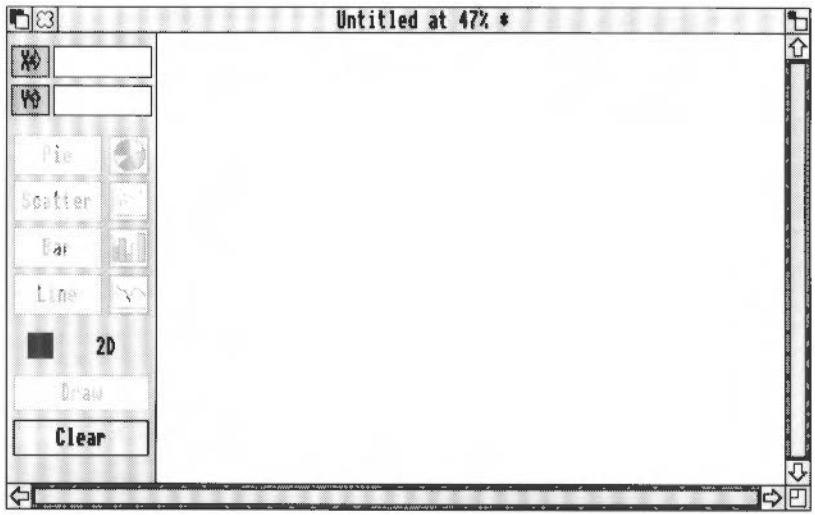
Jim now has to specify how his data will be sent to the Graph tool: as row or column data. In this case, he wants to plot some **columns** from his spreadsheet (see *More on graphs* on page 189 for plotting from a spreadsheet that has its data organised in rows).

1 He chooses the **Utilities/Graph type/Plot columns** option (the default):

2 He chooses the **Utilities/Graphs...** option, to send the data to Advance Graph.

Note: This is the point where you need to read *Saving data in Graph file format* on page 185 or *Appendix B: Using Advance on 1MB or 2MB computers* on page 303 if you're using a 1MB machine.

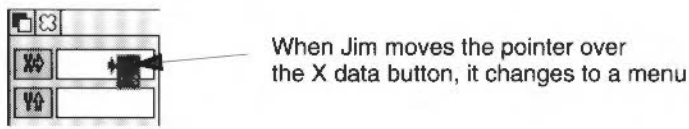
A graph window is displayed (at the moment it looks empty, but in fact Jim's data is there waiting to be used):



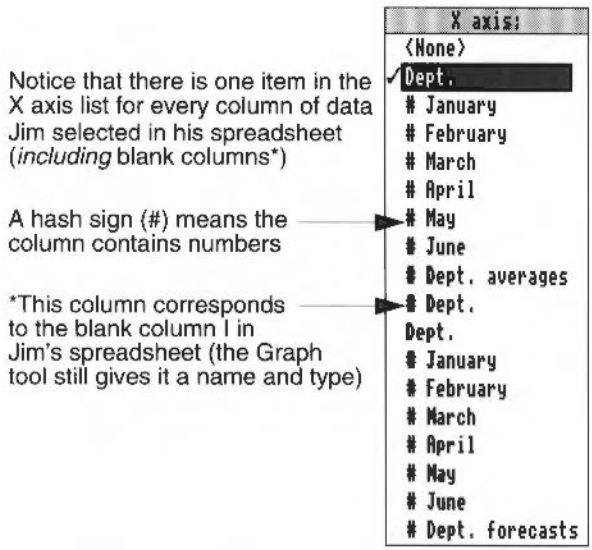
Setting the X axis labels

Jim wants the labels for the X axis to be the department names.

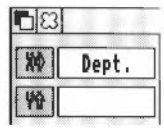
1 He clicks Select on the X data button.



2 Jim chooses `Dept.` from the X axis menu.



The X axis box now reflects Jim's choice:

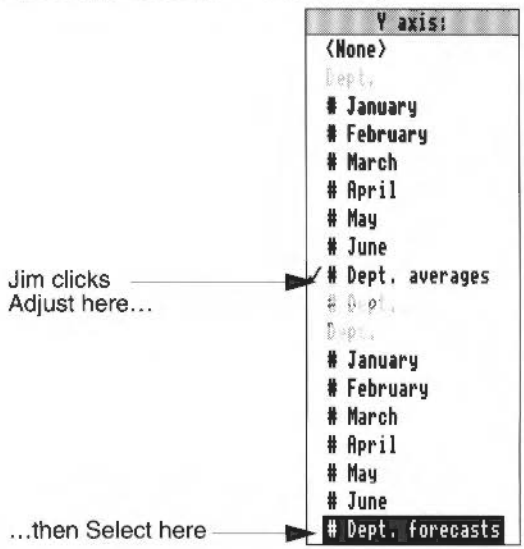


Choosing which data sets to plot

Jim wants to plot two sets of data: the departmental averages, and the departmental forecasts.

1 He clicks on the Y data button.

2 He clicks Adjust on `Dept. averages` (to keep the menu on the screen) then clicks Select on `Dept. forecasts`.



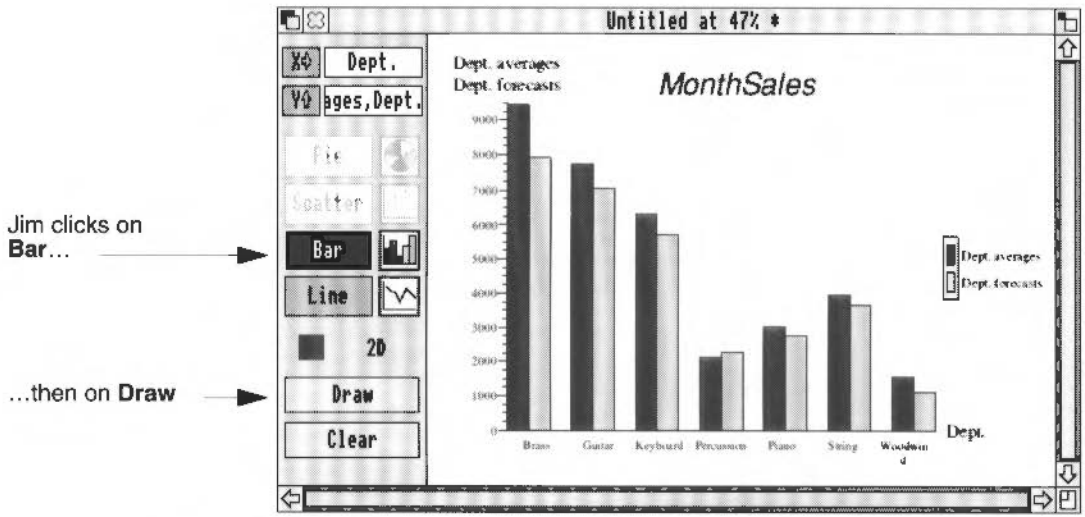
Notice that some items are now greyed out – Jim can't choose blank columns or text as Y data

If you choose the wrong data set by mistake, click on it again to deselect it.

Plotting a bar graph

1 Jim wants a simple bar graph, so he clicks on the **Bar** graph type button.

2 Now Jim simply clicks on the **Draw** button.



Jim's graph is displayed in the Graph window. He can see that for the most part his forecasts were quite reasonable – all the departments except Percussion have exceeded his forecast targets – so Music Matters is doing quite well. See *More on graphs* on page 189 if you want to know about plotting other graph types.

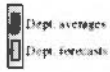
Displaying a grid and a key

To make the graph easier to follow, Jim decides to display a grid:

1 Jim chooses **Graph/Options/Grid**.

2 He clicks on the Draw button again.

Jim's graph is redrawn, showing the grid.



Note: A key is drawn by default. If you don't want a key on your graph, choose the **Graph/Options/Key** option before drawing.

Editing text in a graph

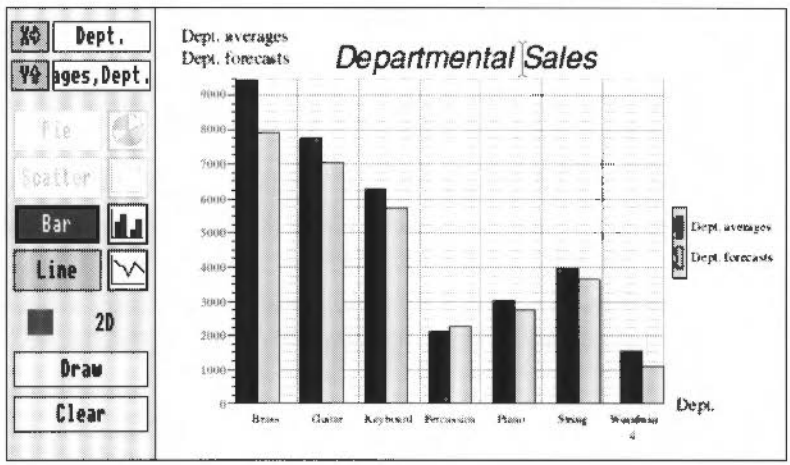
Jim wants the title of his graph to be Departmental sales, instead of MonthSales (the Graph tool picks this up by default from the spreadsheet file name).

1 Jim moves the pointer over the existing title. The pointer changes to a hand.

2 He double-clicks over the title. The pointer changes to a caret shape, and a caret appears in the title.

3 Jim deletes the word Month from the title, and changes it to read `Departmental Sales`.

This is what Jim's graph looks like with the grid and new title:



Saving a graph

Jim wants to save his graph file. He's got two choices:

- He can save his graph as GraphData. This produces a file that the Graph tool can understand. It contains the raw data Jim saved from his spreadsheet, and stores any data sets and effects that Jim set (whether the grid was turned on, whether a key was displayed, and what type of graph was drawn). It does not remember any changes he made to the text (he changed the title).
- He can save his graph as a Drawfile. This produces a file that Draw can understand. It is an exact copy of the graph displayed in the graph window.

Jim decides to save his graph using both methods. That way, he'll be able to use the GraphData file to reproduce his graph. Should he want to add anything extra to his graph, he can do it using Draw.

1 First, Jim chooses the **File/Save as/Draw** option.
He changes the name in the Save as box to `JimsDraw` and saves it.

2 Next, he chooses the **File/Save as/Graph** option and saves the GraphData file as `JimsGraph`.

There are copies of both these files in the `SHtutorial` directory on Data disc A.

If you want to know more about plotting graphs from the spreadsheet, see *More on graphs* on page 189. If you want to find out more about the Graph tool itself, see the chapter entitled *The Graph tool* on page 273.

Printing a graph

This is how Jim prints his graph:

1. He makes sure he's got the correct RISC OS printer driver running and that it has been set up correctly for his printer.
2. He makes sure his printer is set up and ready to print.
3. He presses the Print key to display the print dialogue box.
4. He clicks on Print.
5. When his graph has printed out, he clicks on the Close icon to quit the graph.
6. He chooses **Minimise memory** from the Advance icon bar menu. This frees up any memory used by Advance Graph.

Jim could also have printed the Drawfile version of his spreadsheet (`JimsDraw`). The easiest way would be to drag the file's icon onto the printer icon on the icon bar.

If you're not sure how to set up your printer, see the chapter entitled *Printing* in the RISC OS 3 *User Guide*.

Now Jim's saved and printed his graph, he quits his graph file by clicking on the Close icon.

Printing a spreadsheet

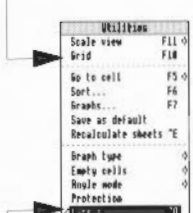
Jim wants to print out a copy of his finished spreadsheet. First of all, he makes sure

- he's got the correct RISC OS printer driver running and that it has been set up correctly for his printer
- his printer is set up and ready to print.

If you're not sure how to set up your printer, see the chapter entitled *Printing* in the RISC OS 3 *User Guide*.

Turning off the grid, and row and column labels

Jim clicks here...



...then here

Jim decides that he only wants to print the portion of the spreadsheet that is being used, not the whole file (which includes empty rows and columns). Also, he doesn't want the grid, or row or column labels to print out. This is how he does it:

1. First, Jim chooses the **Utilities/Grid** option. The tick next to the **Grid** option disappears, and the grid is turned off.

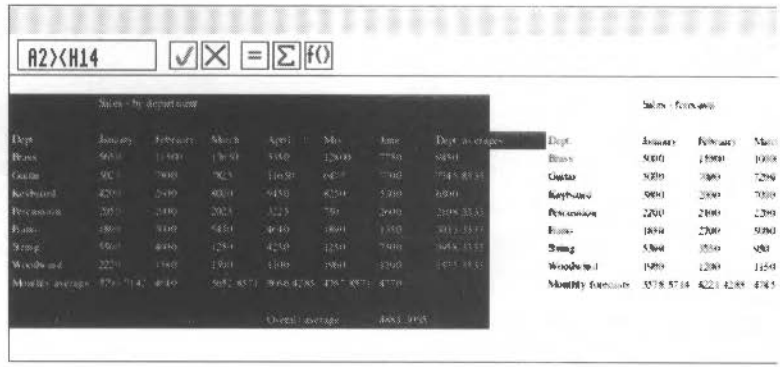
   (Choose this option again if you want to turn the grid back on!)
2. Next, he chooses the **Utilities/Labels** option. The tick next to the **Labels** option disappears, and the row and column labels are turned off.

   (Choose this option again if you want to turn labels back on!)

Printing part of a spreadsheet

Jim realises that he probably won't be able to fit all of his spreadsheet on one sheet of paper, so he decides to print it in two parts.

1 First, he selects the part of the spreadsheet that deals with actual sales figures by dragging the pointer:

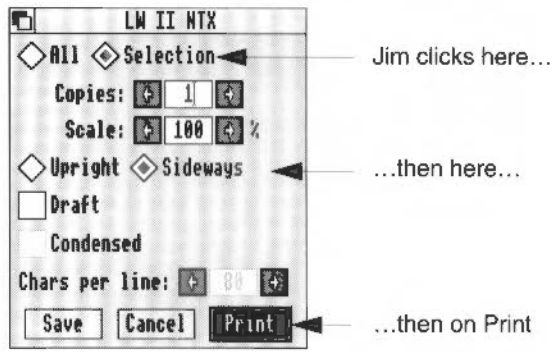


2 Then he presses the Print key on the keyboard, to show the Print dialogue box.

3 He clicks on the **Selection** button.

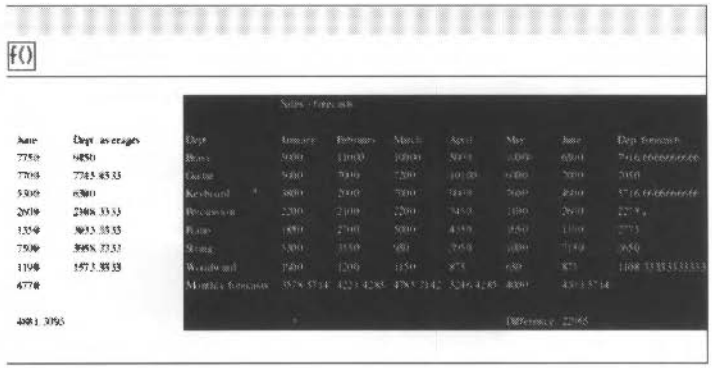
4 He clicks on **Sideways**. That way, his selection will be printed out landscape (sideways) rather than portrait (upright).

5 He clicks on **Print**.



The first part of his spreadsheet prints out after a few moments.

6 Next he selects the second half of his spreadsheet:



7 He presses the Print key again. The settings in the dialogue box have been saved from the last time, so he just clicks on **Print**.

More on printing on page 187 tells you about other ways of printing.

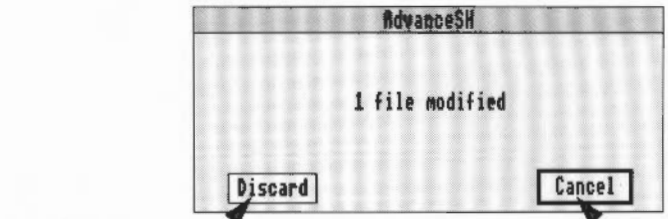
Closing the current spreadsheet

Jim decides he's done enough for the time being, so he closes the spreadsheet window by clicking on the Close icon at the top left of the window.

Quitting Advance altogether

To remove Advance from his computer's workspace altogether, Jim chooses **Quit** from the Advance icon bar menu:

Note: If you have unsaved spreadsheets in memory you will see a dialogue box reminding you to save the spreadsheets. Click on **Cancel** and save the spreadsheets (if you want to) then choose **Quit** again. Just choose **Discard** if you don't want to save your spreadsheets.



The next chapter, entitled *Learning more*, describes the steps you take to perform each spreadsheet command. You'll meet Jim again in the next chapter too, as he gets to grips with some of the more advanced features of the spreadsheet.

Summing up

In this chapter you've been introduced to the basic features of Advance Spreadsheet. You've learnt how to create a spreadsheet and move around it, to enter data and formulae, to edit data, to import a CSV file, to produce a graph and print a spreadsheet.

The following chapter, *Learning more about the Spreadsheet* describes the more sophisticated features of Advance Spreadsheet. In this chapter, Jim creates a more complicated Spreadsheet, and learns how to change the appearance of the text and numbers. He also learns how to create links between Spreadsheet files.

8 Learning more about the Spreadsheet

This chapter introduces the more sophisticated features of Advance Spreadsheet. You'll learn how to format and sort spreadsheet data, use complicated functions and formulæ, and create links between spreadsheets.

Jim Robinson is satisfied with his progress so far. He can quite happily create a simple spreadsheet and produce a graph that shows effectively what all the figures mean. Now Jim's eager to learn more.

This chapter explains the more complicated features of Advance Spreadsheet. Jim will try out most of the techniques as we meet them. They will save him time and enable him to make more efficient use of Advance Spreadsheet.

There are copies of Jim's files on Data disc A, so you can try whatever Jim does.

A couple of hints before you start

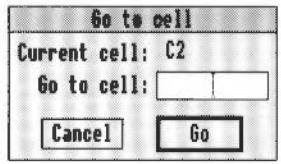
Before Jim starts work on a spreadsheet, here are some short-cuts that will help you and Jim to get around spreadsheets more quickly. Jim won't start work on a spreadsheet until *Changing a spreadsheet's appearance* on page 128.

Moving around the spreadsheet

These short-cuts are especially useful if you can't see a particular cell or block that you want to select.

- Pressing one of the four cursor keys (up, down, left or right arrows) selects the adjacent cell (as long as the spreadsheet is **not** in Edit mode).
- Using the Shift key with the cursor keys moves the selected cell one window's length in the direction of the cursor keys.
- The Page Up and Page Down keys select the cell at the top or bottom of the window (in the same column as the currently selected cell).
- Ctrl up arrow and Ctrl down arrow select the top or bottom cell of a column.
- Ctrl left arrow and Ctrl right arrow select the cell at the start or end of a row.
- The Home key selects cell A1 and places it at the top left of the window.
- The **Utilities/Goto cell** option lets you select a particular cell, and places it so that you can see it in the spreadsheet window.

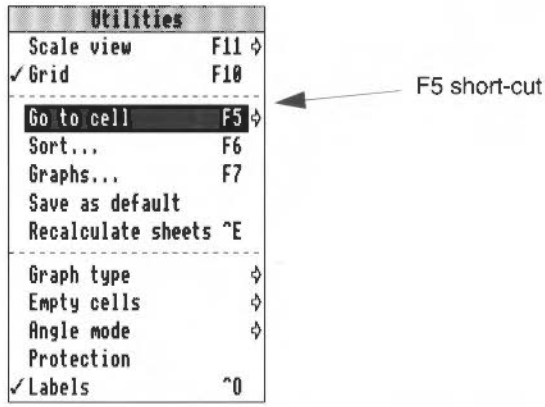
There is a short-cut which will display the Go to cell dialogue box without you having to use the Menu button: press F5.



The next section tells you more about short-cuts. *Appendix D: Keyboard short-cuts* on page 319 lists the complete range of short-cuts.

Using menu short-cuts

Jim has noticed that when he displays a menu, there are often symbols (such as ^) and characters next to some of the menu options. For example, F5 appears next to the **Goto cell** option.



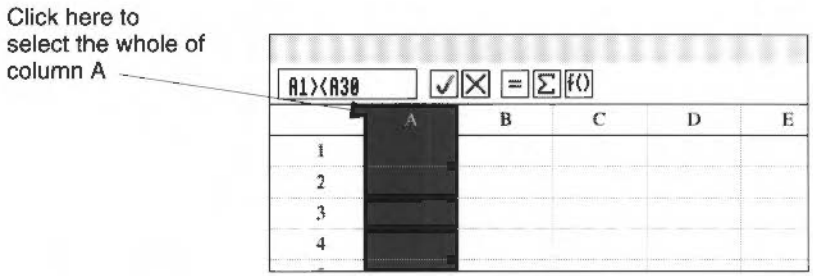
These letters and symbols are keyboard short-cuts, which save using a particular menu option:

- The 'hat' shape ^ represents Ctrl. Press and hold down Ctrl, then press the appropriate key to make the selection.
- The ⇧ represents Shift. Press and hold down Shift and then press the appropriate key to make the selection.
- The symbols F1 to F12 denote the function keys along the top of the keyboard. Press the appropriate function key to make the selection.

Try out some short-cuts as you go through this chapter. Jim will come across some from time to time, but feel free to try out any you notice that aren't mentioned specifically. The more you can remember and use, the better – they'll save time.

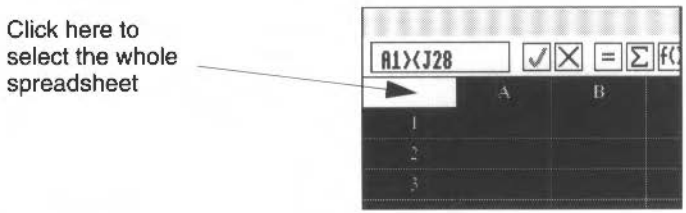
Selecting whole rows or columns

Sometimes you need to select a whole row or column at once. All you have to do is click on the label of that row or column.



Selecting the whole spreadsheet

To select a whole spreadsheet, click on the **Select all** cell:



Clearing a selection

There are three ways to clear an existing selection:

- Select another cell or block.
- Choose the **Edit/Clear** option.
- Use the Ctrl-Z short-cut.

Now that Jim knows about a few short-cuts, he wants to spend a bit of time sprucing up the appearance of his file `MonthSales` that he created in the previous chapter, *Getting started with the Spreadsheet*.

Changing a spreadsheet's appearance

Jim now wants to format his spreadsheet `MonthSales`, to make it more visually appealing. To do this he's going to use the **Edit/Effect** options.

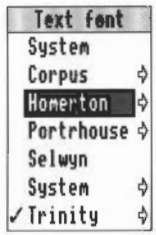
Jim wants to try out as many of these options as he can to start with. He realises that having lots of different effects in one spreadsheet will probably make it look a bit too 'busy', but once he's got an idea of how to use all the options he'll be able to use the ones that he likes best.

If you want to follow what Jim does, open a copy of the file `Jim_6`. If you want to see what his spreadsheet looks like **after** he's done all his formatting, open a copy of the file `MonthSales` (this takes him up to *Entering data into the spreadsheet* on page 137). Both files are in the `SHtutorial` directory on Data disc A.

Jim starts Advance, opens his file, and makes sure that the labels and grid are displayed (F10 turns the grid on and off, Ctrl-O turns labels on and off).

Changing the text font

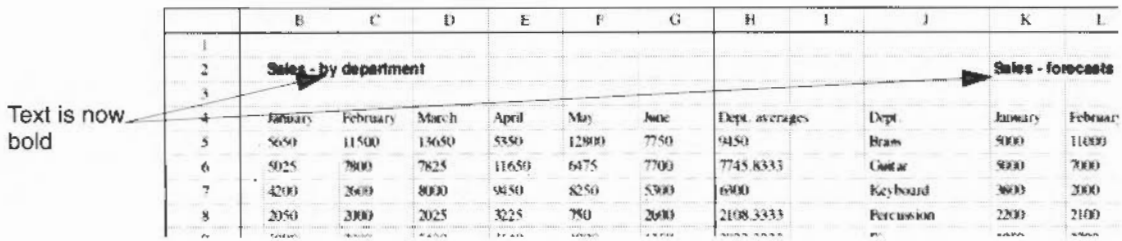
Jim wants the title `Sales - by department` to be bold, so he chooses a new font. He highlights cell B2 and chooses the **Effect/Text font/Homerton** option.



Making text bold

To make the title bold, Jim chooses the **Effect/Bold** option. (He could instead have chosen the **Effect/Text font/Homerton/Bold** option in the previous section.)

Jim applies the same formats to cell K2. Here's what his spreadsheet looks like:



Making text italic

Jim doesn't actually want any italic text in this spreadsheet, but it's easy to do: just choose the **Effect/Italic** option. Text can be ***bold and italic*** at the same time.

Note: There are short-cuts available for making text bold or italic: Ctrl-B for bold; Ctrl-I for italic. (Use these short-cuts to remove bold or italic formats too.)

Changing text size

Now Jim wants to change the size of the title text, as he thinks the titles look good but are a bit too small. First, he selects cell B2, goes to the **Effect/Text size** menu and clicks on **14pt**. The text grows in size.

	A	B	C	D	E
1					
2		**Sales - by department**			
3					
4	Dept.	January	February	March	April

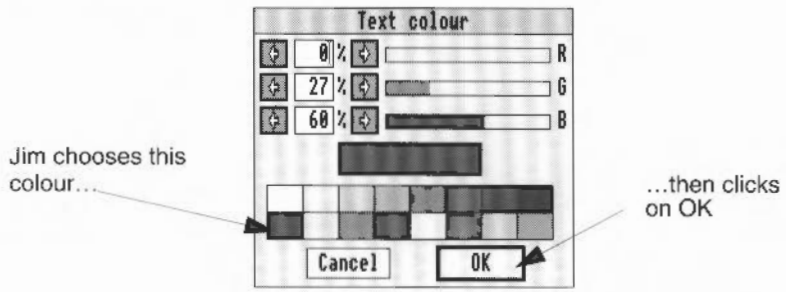
Then Jim uses the same method to increase the size of the title in cell K2.

Changing text colour

Next Jim wants the text in the title to be blue:

1 With cell B2 selected, he moves to the **Effect/Text colour** option and clicks on the blue box.

2 He clicks on **OK.**

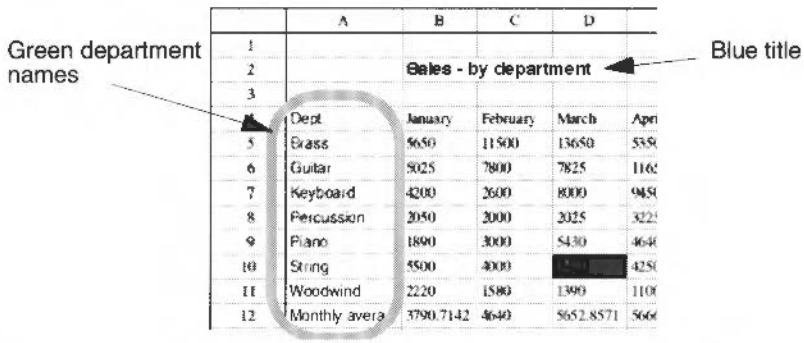


Note: To start with (because the cell is still selected) the cell looks blue and the text looks white. The text shows up in blue as soon as Jim selects a different cell.

Jim carries on sprucing up the spreadsheet by changing the effects applied to the department names and column titles (months and so on).

3 He selects the label of column A (i.e. the letter A itself). This selects the whole column.

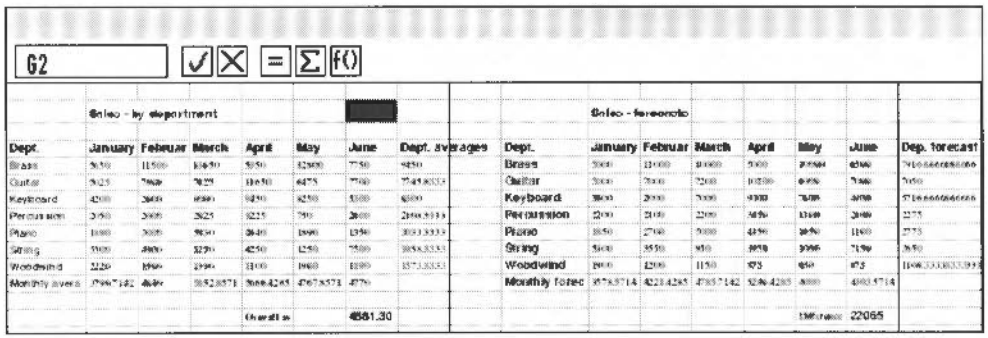
4 He uses the **Effects/Text colour** option to change the colour of the department titles to green. He changes the font to Homerton Bold (which is easier to read).



5 Jim changes the colour and font of the names in column J as well, using the same method.

6 He then selects row 4 and changes the text font to Homerton Bold, the text colour to red, and the text size to 14pt.

Next, Jim wants to enlarge and colour the overall average for the whole of Music Matters (cell G14). He changes the text size to 14pt, the font to Homerton Bold, and changes the text colour to red. He then repeats this process on cell P14.



Resizing cells

Jim decides to change the height of the cells containing the titles, as the text is now a little large for them.

Jim simply double-clicks on the label of row 2. This increases the height of all the cells in row 2 to accommodate the largest item (which is the title).

Jim double-clicks here and the row increases in height

	A	B	C	D	E	F	G
1							
2		Sales - by department					
3							
4	Dept.	January	Februar	March	April	May	June
5	Brass	9650	11500	13650	5350	12800	7750
6	Guitar	9025	7800	7825	11650	6475	7700
7	Keyboard	4200	2600	8000	9450	8250	5300
8	Percussion	2950	2000	2925	3225	750	3600
9	Piano	1800	3000	5430	4640	1890	1350

Note: There are other ways of resizing cells and blocks by changing the column and row widths and heights: by dragging with the mouse or by using menus.

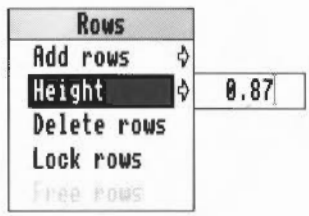
Changing cell size using the mouse

Jim uses the method in *Widening a column* on page 97 to widen column H.

You can also use the mouse to adjust the height of a block of rows (or width of a block of columns) in a single operation. Move the pointer into the label area of the last highlighted row or column. Move the pointer to the edge of the row or column so that the pointer changes to a double headed arrow. Now hold down the Select button and drag on the last highlighted column or row. This changes the width/height of all highlighted columns or rows.

Changing cell size using the Rows and Columns menu options

By using either the **Edit/Columns** menu or **Edit/Rows** menus, you can set the selected column width or row height in inches or millimetres. You can change either a single column or row or a selection.



Changing the cell size using the Alter size... menu option

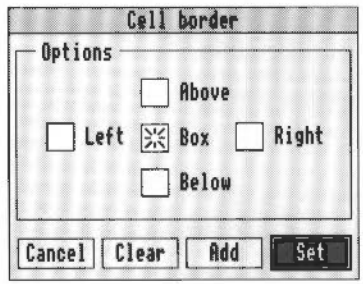
If you want to change the size of every cell in a spreadsheet, use the **Edit/Alter size...** option. See *Changing the overall dimensions of a spreadsheet* on page 160.

Adding and changing borders round a cell or block

Jim thinks it would be useful to put borders round the two sets of data (actual sales and forecasts) to differentiate between them more, and to put a border round the cell containing the difference between the two (cell P14).

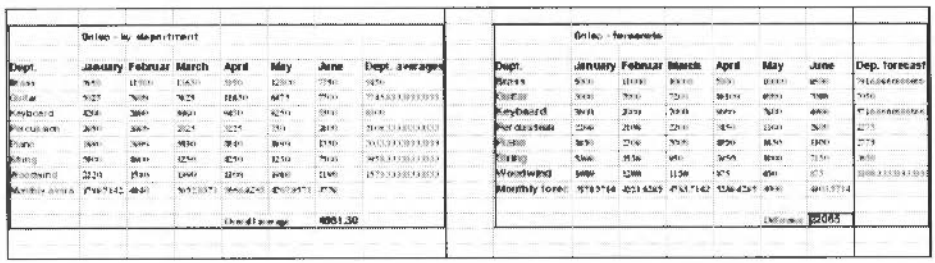
1 With block A2><H14 selected, Jim chooses the **Effect/Cell border** option to display the Cell border dialogue box.

2 He clicks on **Box** and then on **Set**. A border appears all the way round the cells.



3 Next, he selects the block J2><Q14, and chooses Box and Set from the Cell border dialogue box.

4 Finally, he puts a border round the cell P14:



Here's a summary of what all the options in the Cell borders dialogue box do:

- **Box** option draws a black outline around your selected cell or block.
- The **Above**, **Left**, **Right** and **Below** options draw lines on the appropriate edges of **each cell** in your selected block.
- **Cancel** removes the dialogue box from the screen without applying changes.
- **Clear** deletes lines from borders already specified.
- **Add** adds lines to borders already specified.
- **Set** deletes any previous border set up and replaces it with a new one.

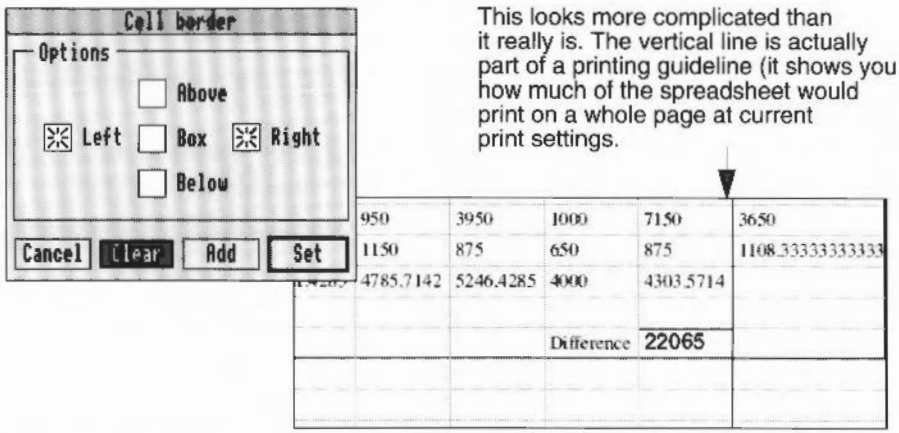
For example, to delete the left and right borders on cell P14:

1 Jim selects cell P14.

2 He displays the Cell border dialogue box.

3 Then he clicks on the **Left** and **Right** buttons.

4 He clicks on **Clear**.



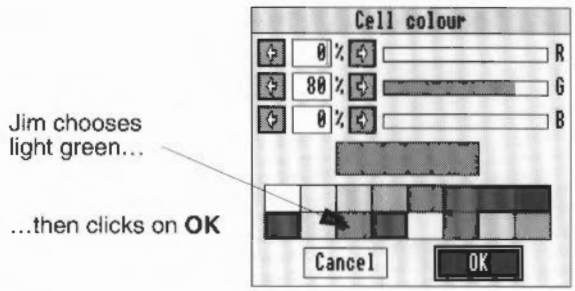
This deletes the borders on the left and right sides.

Changing the cell background colour

Jim wants to change the colours of cells E14 and O14.

1 He selects cell E14 and chooses the **Effect/Cell colour** option to display the Cell colour dialogue box.

2 He clicks on the light green colour then on **OK**. The cell's colour changes to green.



3 He does the same to cell O14.

Changing the number format

Jim thinks that the numbers in his sheet should be displayed in pounds and pence, with a pound sign in front. He wants amounts that are greater than a thousand to have a comma separator (i.e. 2345 will be displayed as £2,345.00).

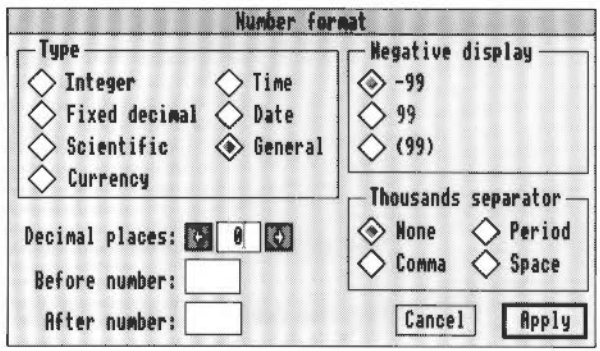
This is how Jim changes the number format:

1 To select every cell in the spreadsheet, Jim clicks on the Select all cell, in the top left corner of the spreadsheet.

Note: He could instead have chosen the **Edit/Select all** option or used the Ctrl-A short-cut.

2 Jim chooses the **Effect/Number format...** option to display the Number format box (he could have used the F8 short-cut):

Number format box showing default settings



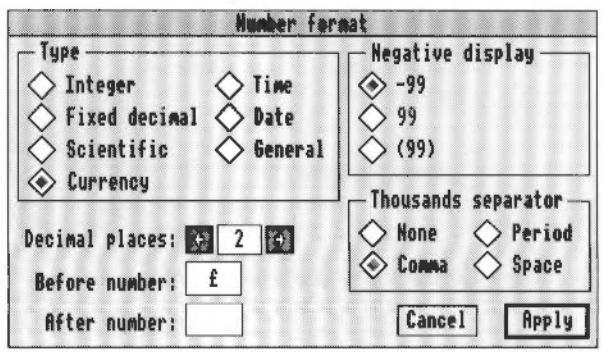
3 Then he chooses the **Currency** option.

4 Next, he changes the number of decimal places to two.

5 Then he types a pound sign (£) in the **Before number** box.

6 He clicks on **Comma** as a thousands separator.

7 Finally he clicks on **Apply** to make the changes.



The number format Jim has defined applies to the whole spreadsheet – any more numbers Jim enters will also have this format. The format does **not** affect cells that only contain text.

There's more on displaying numbers in *More about number formats* on page 178.

Tidying up cell widths

Some of the figures and headings are now too wide to fit in their cells properly.

1. Jim widens columns A, H, and J by dragging the column header dividers (see *Widening a column* on page 97).
2. He widens column Q by selecting the whole column, choosing the **Edit/Columns/Width**, and increasing the width to 3.6cm.
3. He selects columns B to G and drags column G's column divider to the right until all the figures and headings fit properly in their cells.
4. He does the same for columns K to P.

This shows the first half of Jim's sheet after it's been tidied up a bit!

	Sales - by department						
Dept.	January	February	March	April	May	June	Dept. averages
Brass	£5,650.00	£11,500.00	£13,650.00	£5,350.00	£12,800.00	£7,750.00	£9,450.00
Guitar	£5,025.00	£7,800.00	£7,825.00	£11,650.00	£6,475.00	£7,700.00	£7,745.83
Keyboard	£4,200.00	£2,600.00	£8,000.00	£9,450.00	£8,250.00	£5,300.00	£6,300.00
Percussion	£2,050.00	£2,000.00	£2,025.00	£3,225.00	£750.00	£2,600.00	£2,108.33
Piano	£1,890.00	£3,000.00	£5,430.00	£4,640.00	£1,890.00	£1,350.00	£3,033.33
String	£5,500.00	£4,000.00	£1,250.00	£4,250.00	£1,250.00	£7,500.00	£3,958.33
Woodwind	£2,220.00	£1,580.00	£1,390.00	£1,100.00	£1,960.00	£1,190.00	£1,573.33
Monthly averages	£3,790.71	£4,640.00	£5,652.86	£5,666.43	£4,767.86	£4,770.00	
						£4,881.31	

Changing cell alignment

Now that all the numbers are displayed in pounds and pence, Jim thinks that all the decimal points should line up to make things look neater.

1. To start with, he selects the block B5><H12.
2. Then, he moves to the **Effect/Alignment** menu option and chooses **Right**.

All the numbers in this block are now aligned to the righthand sides of their cells (this has the desired effect of lining up all the decimal points).

	Sales - by department						
Dept.	January	February	March	April	May	June	Dept. averages
Brass	£5,650.00	£11,500.00	£13,650.00	£5,350.00	£12,800.00	£7,750.00	£9,450.00
Guitar	£5,925.00	£7,800.00	£7,825.00	£11,650.00	£6,475.00	£7,700.00	£7,745.83
Keyboard	£4,200.00	£2,600.00	£8,000.00	£9,450.00	£8,250.00	£5,300.00	£6,300.00
Percussion	£2,050.00	£2,000.00	£2,025.00	£3,225.00	£750.00	£2,600.00	£2,108.33
Piano	£1,890.00	£3,000.00	£5,430.00	£4,640.00	£1,890.00	£1,350.00	£3,033.33
String	£5,500.00	£4,000.00	£1,250.00	£4,250.00	£1,250.00	£7,500.00	£3,958.33
Woodwind	£2,220.00	£1,580.00	£1,390.00	£1,100.00	£1,960.00	£1,190.00	£1,573.33
Monthly averages	£3,790.71	£4,640.00	£5,652.86	£5,666.43	£4,767.86	£4,370.00	
						£4,881.31	

Jim changes the alignment cells in the block K5><Q11 in the same way.

Aligning long text strings

A text string is a computer term that means "a series of ASCII characters to be treated as text". You don't need to worry too much about this; it really means "one or more letters". `Sales - by department` is an example of a text string.

If a text string is too long to fit inside a cell, it overflows into adjacent empty cells. The direction in which it overflows depends on the way text alignment is set.

- If the string is right-aligned, then it overflows into empty cells on the left.
- If the string is left-aligned, it overflows into empty cells to the right.
- If the string is centred, then it overflows into cells on both the left and the right.

If the adjacent cells already contain data, the string does not overflow; it aligns into what space remains, but is truncated at the cell border. Don't worry – this just means that you won't be able to read the whole string – the missing text is still there; it hasn't actually been deleted! If you do want to be able to read all the text, just alter the size of the column (see *Resizing cells* on page 131).

That's the end of Jim's practice at formatting spreadsheets. He saves and quits his `MonthSales` sheet. In the next section he's going on to some more calculations.

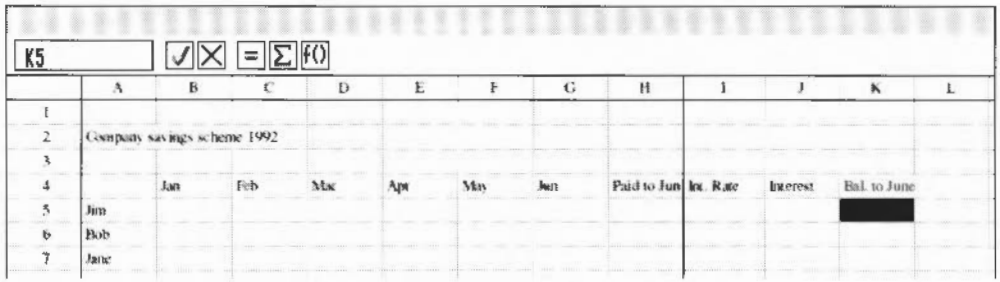
Entering data into the spreadsheet

Jim has had a phone call from Bob Davies, who wants to know how much he has put into a savings scheme run by Music Matters. He also wants to know how much interest he's earned. Jim thinks it would be a good idea to have a spreadsheet to keep a record of the savings scheme, as Bob, Jane and he all put money into it.

Copy the file `Jim_A` (in the `SHtutorial` directory on Data disc A) to your work disc and open it now if you want to see what Jim's spreadsheet looks like when he's entered the headings and data (this takes him up to *Filling a block of cells with the same formula or data* on page 141).

Speeding up data entry using an input block

First of all, Jim creates a blank spreadsheet. He decides what information the spreadsheet will need to contain, adds three extra columns (see *Adding rows and columns* on page 111) and fills in some row and column headings. His spreadsheet looks like this:

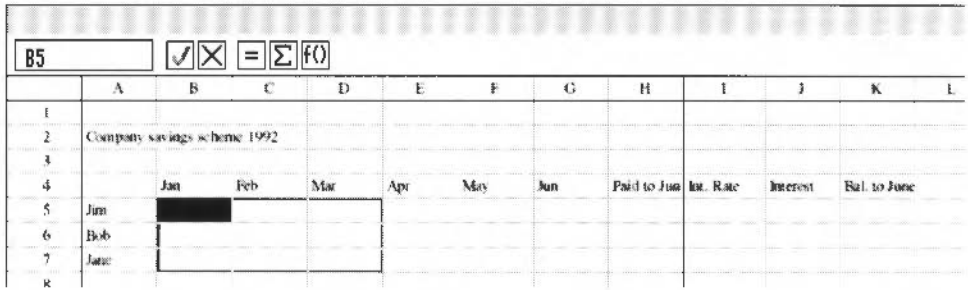


Jim now wants to enter the amounts that people have paid in each month. He decides to try the **Input block** option to speed things up a little. Here's the first set of figures (see how Jim enters them after the table):

	Jan	Feb	Mar
Jim	30	40	50
Bob	20	30	60
Jane	30	40	30

1. He selects the block of cells B5 to D7.
2. He chooses the **Edit/Input block** option (he could have used the keyboard short-cut Ctrl-Shift-F8).

3 He selects cell B5, and notices that a black outline has appeared around his chosen input block:

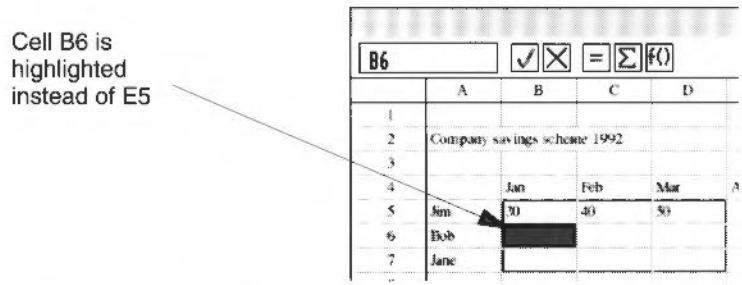


Filling an input block row by row

Jim starts to enter the savings figures.

1 With cell B5 selected, Jim enters all his own savings figures first, pressing Tab after each number.

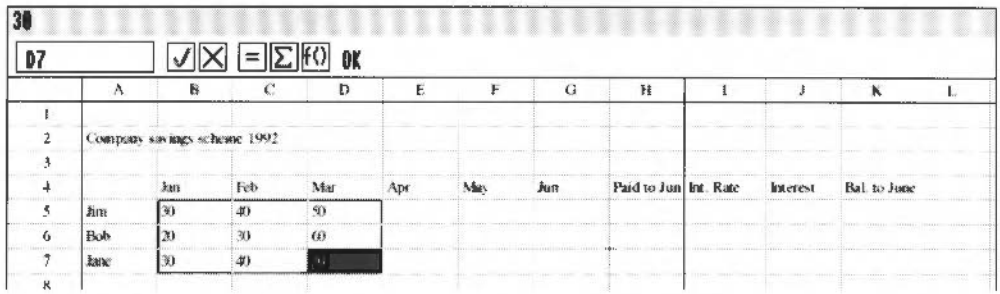
He sees that when he enters his figure for March (50) and presses Tab, cell B6 is highlighted next, instead of E5, ready for him to start entering Bob's figures.



2 He enters all Bob's figures, then Jane's, pressing Tab after each one.

So, in this case the input block fills up row by row. The selected cell cannot go outside the input block while he's entering data like this. Once he gets to cell D7, he can't enter any more data.

When he's finished, the spreadsheet looks like this:



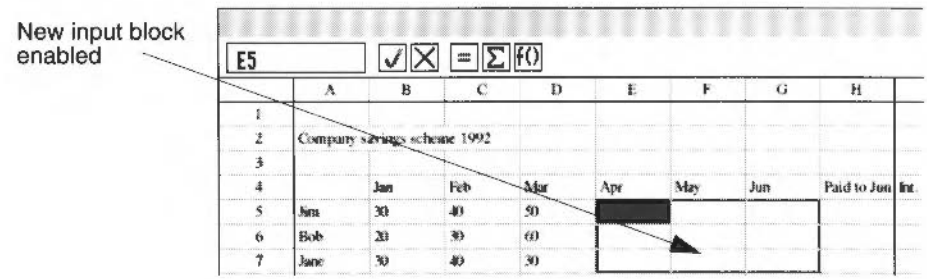
Jim would have found this very handy when he was entering the sales figures into his spreadsheet in the previous chapter!

Changing the input block

Jim decides to define a new input block, so that he can enter the savings figures for April to June. These are the figures he wants to enter:

	Apr	May	Jun
Jim	40	40	30
Bob	60	60	50
Jane	50	60	30

1. He selects cells E5 to G7.
2. He presses Ctrl-Shift-F8 disable the previous block.
3. He presses Ctrl-Shift-F8 **again** to enable his new block.
4. He selects cell E5, ready to start entering figures:



Filling an input block column by column

Jim starts to enter the figures into his new input block:

1 He selects cell E5, enters his own savings for April (40) and presses **Return** instead of Tab. This selects cell E6.

2 Now he enters Bob and Jane's savings for April, pressing Return each time. This time the block fills column by column. When he's entered all April's figures, cell F5 is selected, ready for him to start entering May's figures.

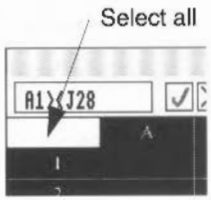
3 Jim finishes entering all the figures, pressing Return after each one.

Company savings scheme 1992

	Jan	Feb	Mar	Apr	May	Jun	Paid to Jun	Int. Rate	Interest	Bal. to June
Jim	30	40	50	40	40	30				
Bob	20	30	60	60	60	50				
Jane	30	40	30	50	60	30				

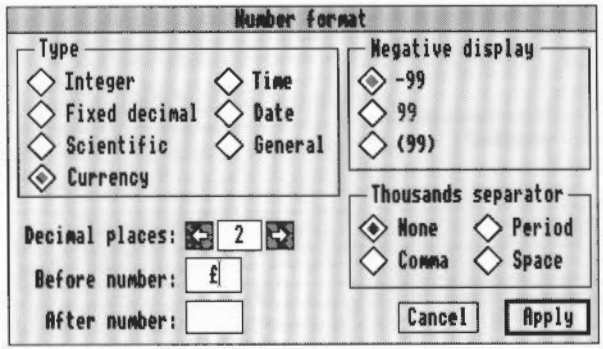
4 Jim cancels the input block by pressing Ctrl-Shift-F8 again.

Next Jim decides that he wants all the numbers in the spreadsheet to be displayed in pounds and pence.



1 He selects the whole spreadsheet by clicking on the Select all cell.

2 Then he displays the Number format box (by choosing **Effect/Number format...**) and fills it in so that, for example, 40 appears as £40.00 (see *Changing the number format* on page 134 for more on this).



Jim fills out the Number format box like this.

Then he clicks on Apply

3 He chooses **Edit/Clear** to clear the selection.

Jim saves his spreadsheet now. He calls it `MMSavings`. (If you're following Jim's example, give your file a different name, to avoid confusion.)

Filling a block of cells with the same formula or data

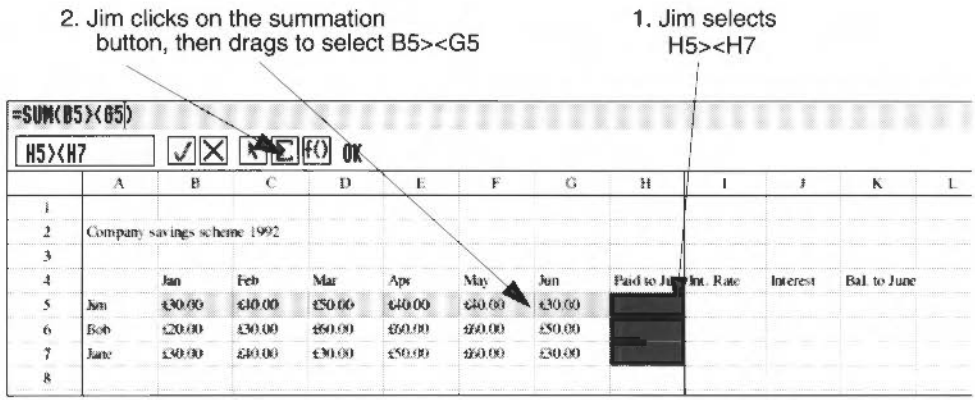
Next, Jim wants to fill a block of cells with the same formula. He wants to calculate how much everybody has paid in to the savings scheme for the first half of the year, and how much interest they've earned.

Copy the file `Jim_B` (in the `SHtutorial` directory on Data disc A) to your work disc and open it now if you want to see what Jim's spreadsheet looks like when he's entered the formulæ and data (this takes him up to the beginning of *Sorting spreadsheet data* on page 144).

To start with, Jim's going to calculate the amounts paid in. He's going to fill a block with the same formula (which will be adjusted for position). This is how he fills the block:

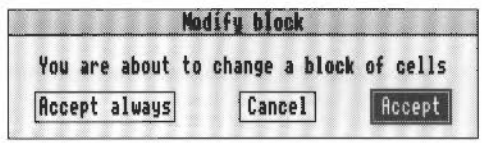
1 He starts by selecting the block of cells H5 to H7.

2 Now he enters in the formula. He does this by clicking on the Summation button then selecting the block B5 to G5:

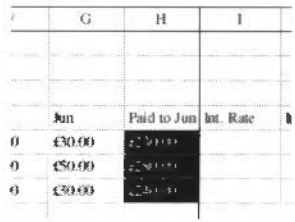


Notice that he only enters the formula as if it applied to row 5, the first row in the block.

3 Next he clicks on the Enter button to apply the formula. He is asked to confirm that he wants to change the whole block.



4 He then clicks on **Accept** to confirm the block fill. The correct totals appear in all three cells. Advance Spreadsheet has adjusted the formula automatically.



Next, Jim wants to fill a block of cells with the interest rate that Music Matters pays every six months on its savings scheme – 10%.

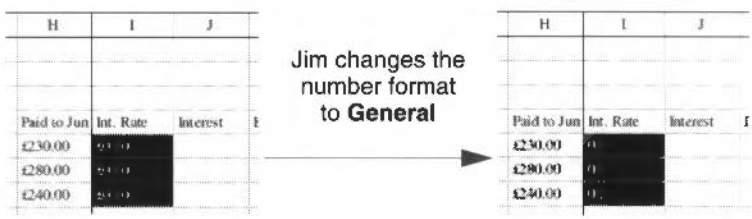
This is how he fills the block:

1 He starts by selecting the block of cells I5 to I7.

2 Now he types in the interest rate, in this case 0.1 (which means 10%) and presses Return. He is asked to confirm that he wants to change the whole block.

3 He clicks on **Accept** to confirm the block fill and 0.1 is copied into all three cells in the selected block.

Note: At this stage, the spreadsheet displays £0.10 in these three cells. This is because of the way Jim has set up the number format. He selects the three cells again presses F8, and changes their number format to **General** so that they show 0.1 (*More about number formats* on page 178 tells you how to alter this).



Jim now fills in the other empty columns with their formulæ:

1 He selects the block J5 to J7.

2 He clicks on the Edit mode button.

3 He clicks on cell H5, types a multiplication sign (*) then clicks on cell I5.

4 He clicks on the Enter button and **Accept**s the block fill.
The spreadsheet looks like this:

Company savings scheme 1992										
	Jan	Feb	Mar	Apr	May	Jun	Paid to Jun	Int. Rate	Interest	Bal. to June
Jim	£30.00	£40.00	£50.00	£40.00	£40.00	£30.00	£230.00	0.1		
Bob	£20.00	£30.00	£60.00	£60.00	£60.00	£50.00	£280.00	0.1		
Jane	£30.00	£40.00	£30.00	£50.00	£60.00	£30.00	£240.00	0.1		

Cells J5 to J7 now calculate the interest earned after six months.

Now he calculates the total balances after six months:

1 He selects the block K5 to K7.

2 He clicks on the Edit mode button, then cell H5, then cell J5, then the Enter button.

3 He clicks on **Accept** to confirm the block fill. This puts the formula `=H5+J5` into the Entry area. The spreadsheet now looks like this:

Company savings scheme 1992										
	Jan	Feb	Mar	Apr	May	Jun	Paid to Jun	Int. Rate	Interest	Bal. to June
Jim	£30.00	£40.00	£50.00	£40.00	£40.00	£30.00	£230.00	0.1	£23.00	£253.00
Bob	£20.00	£30.00	£60.00	£60.00	£60.00	£50.00	£280.00	0.1	£28.00	£308.00
Jane	£30.00	£40.00	£30.00	£50.00	£60.00	£30.00	£240.00	0.1	£24.00	£264.00

Jim decides to save his work now.

Sorting spreadsheet data

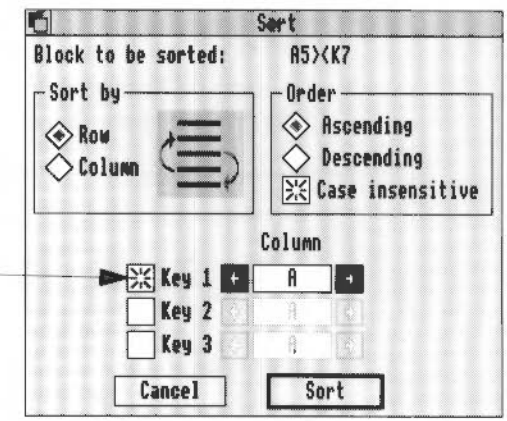
Before he proceeds any further with this spreadsheet, Jim decides to **sort** the data so that the three names are in alphabetical order. He wants to make sure however that the right savings figures stay with the right names! He can use the **Utilities/Sort...** option (or the short-cut – F6) to do this.

Copy the file `Jim_C` (in the `SHtutorial` directory on Data disc A) to your work disc and open it now if you want to see what Jim's spreadsheet looks like when he's sorted his spreadsheet data (this takes him up to the beginning of *Copying, pasting, deleting and moving* on page 146).

1 He selects the block A5><K7.

2 He chooses the **Utilities/Sort...** option to display the Sort dialogue box (he could have used the F6 short-cut).

Most of the options on the Sort dialogue box are self-explanatory. Key rows and columns are explained below.



3 He leaves all the settings as they are and clicks on **Sort**.

The block of data is sorted so that the three rows swap positions (Bob's row of figures is now first):

Bob's row is now first

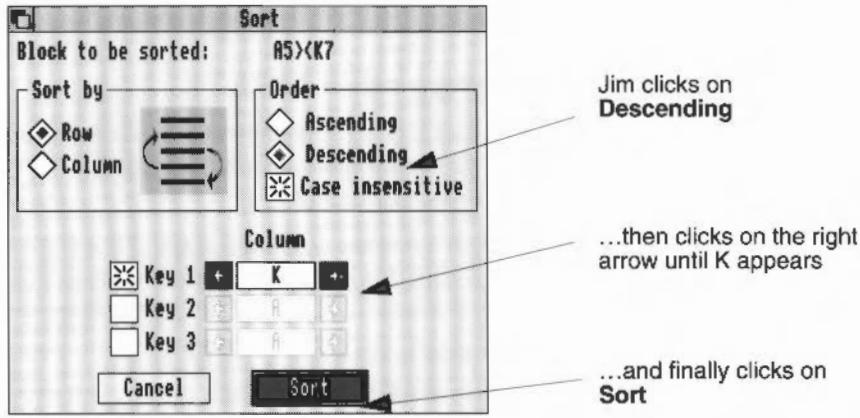
	A	B	C	D	E	F	G	H	I	J	K
1											
2	Company savings scheme 1992										
3											
4		Jan	Feb	Mar	Apr	May	Jun	Paid to Jun	Int. Rate	Interest	Bal. to June
5	Bob	£20.00	£30.00	£60.00	£60.00	£60.00	£50.00	£280.00	0.1	£28.00	£308.00
6	Jane	£30.00	£40.00	£30.00	£50.00	£60.00	£30.00	£240.00	0.1	£24.00	£264.00
7	Jim	£30.00	£40.00	£50.00	£40.00	£40.00	£30.00	£230.00	0.1	£23.00	£253.00
8											

All the savings figures and formulæ are swapped too, so that they still apply to the right person. This is why Jim selected the whole block. If he had just sorted the three names, Jim's balance would have appeared against Jane's name.

Defining a key row or column

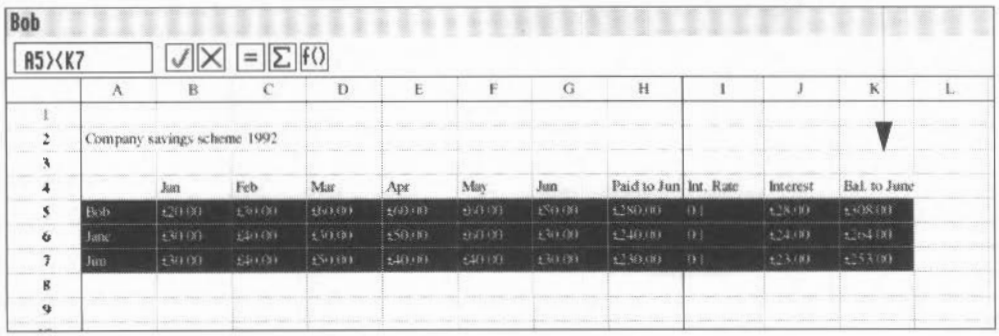
Jim changes his mind about the way he's sorted the savings figures. He now thinks he'd prefer to sort the data in order of descending values of total savings, so that the highest savings figure is at the top of column K, and the lowest at the bottom. Column K will be the **key column** this time.

1. Jim selects the block B5><K7.
2. He presses F6 to display the Sort dialogue box.
3. He clicks on the Descending button so that whatever he sorts will be in descending order, instead of ascending order (the default).
4. He changes the Key 1 box so that the key column is column K, not column B (the default key row/column is always the first in a block) and clicks on **Sort**.



All the rows in the block are swapped round, this time using the data in column K (the key column) to decide the order.

Rows are ordered according to descending value in column K



Jim saves his spreadsheet again.

Sorting by column

The same principles apply to sorting by column. When you sort by column, the columns in the selection change places, rather than the rows. You need to define a key **row** to govern the sort order.

You'll find extra information on sorting and sort keys in *More on sorting* on page 176.

Copying, pasting, deleting and moving

Jim wants to be able to copy cells and blocks of data around in a spreadsheet, without having to retype things all the time.

Copy the file `MMSavings` to your work disc and open it now if you want to see what Jim's spreadsheet looks like when he's finished this spreadsheet (this takes him up to the beginning of *Designing a more complicated spreadsheet* on page 158).

Copying and pasting a cell or block

Jim decides to add to his spreadsheet. He thinks it would be a good idea to set up a blank table so he can enter people's savings for the coming six months as they pay them in, month by month.

Jim thinks it will save him time if he copies the existing layout he's already designed, as it contains all the formulæ he wants. All he then needs to do is edit a few cells and he'll have a 'template' set up ready to enter more savings figures.

1. First, Jim selects the block A4 to K7.
2. He chooses the **Edit/Copy** option (he could have used the Ctrl-C short-cut).
3. Next, he selects cell A9.
4. He chooses the **Edit/Paste** option (he could have used the Ctrl-V short-cut).

A9

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2	Company savings scheme 1992											
3												
4		Jan	Feb	Mar	Apr	May	Jun	Paid to Jun	Int. Rate	Interest	Bal. to June	
5	Bob	£20.00	£30.00	£60.00	£60.00	£60.00	£50.00	£280.00	0.1	£28.00	£308.00	
6	Jane	£30.00	£40.00	£30.00	£50.00	£60.00	£30.00	£240.00	0.1	£24.00	£264.00	
7	Jim	£30.00	£40.00	£50.00	£40.00	£60.00	£30.00	£230.00	0.1	£23.00	£253.00	
8												
9		Jan	Feb	Mar	Apr	May	Jun	Paid to Jun	Int. Rate	Interest	Bal. to June	
10	Bob	£20.00	£30.00	£60.00	£60.00	£60.00	£50.00	£280.00	0.1	£28.00	£308.00	
11	Jane	£30.00	£40.00	£30.00	£50.00	£60.00	£30.00	£240.00	0.1	£24.00	£264.00	
12	Jim	£30.00	£40.00	£50.00	£40.00	£60.00	£30.00	£230.00	0.1	£23.00	£253.00	
13												

The block (containing both data and formulæ) is copied to the new position. All cell references in the copied formulæ are adjusted, so they refer to the right cells.

For example, the formula in cell K10 is H10 +J10, whereas the formula in the cell this was copied from is H5+J5. Note that all the formatting information (number formats, in this case) has been copied as well.

At the moment, the month names are wrong in the block he's just pasted. He'll change these later. For now, Jim saves his spreadsheet again.

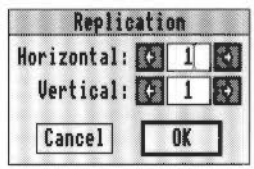
Making multiple copies with Replicate

Here's a bit more information on copying. Jim doesn't need to use this technique right now, but it's useful to know about it.

Edit/Copy followed by **Edit/Paste** only performs a single copy. However you can use **Edit/Copy** followed by the **Edit/Replicate** option to make multiple copies of a cell or block.

1 Select the cell or block you want to replicate and choose **Edit/Copy**.

2 Select the first cell you want your copies to start from and fill in the Replication box from the **Edit/Replicate** menu.



3 Click on **OK**.

Note: If you select a **block** after you've copied a formula, you won't need to change anything in the Replicate box (the correct number of horizontal and vertical copies will be filled in automatically). Just click on OK.

- **Horizontal** copies are repeated along the horizontal axis, side by side, from left to right.
- **Vertical** copies are repeated on the vertical axis, running downwards, one below the other.
- **Horizontal and vertical** copies run across and down.

Replicate will automatically adjust any formulæ for position.

Hint: If the cell you're going to replicate happens to be the first cell of the block you want to fill, just select the block, press Return and click on **Accept** to fill the block. This cuts out the need for using Replicate, and saves time.

Deleting a cell or block

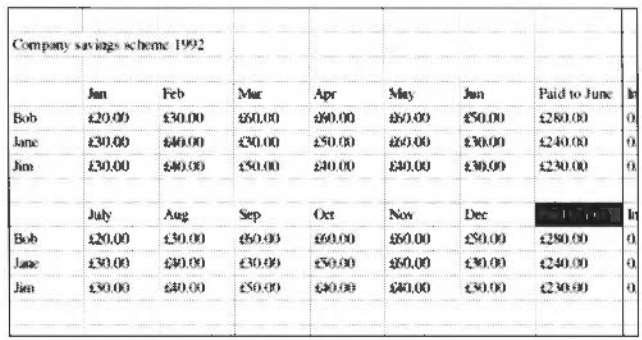
Having copied and pasted the block, Jim now needs to make a few changes. For a start, the month names are wrong. Also, he needs to remove all the savings figures, so when the time comes he can start filling in new ones. There are two ways he can remove data from the spreadsheet.

Removing with Delete

First, Jim corrects the month names:

1. Jim selects the block B9 to G9.
2. He chooses the **Edit/Delete** option (he could have used the keyboard short-cut Ctrl-K).

   The existing month names are deleted, but the block remains selected.
3. He selects cell B9.
4. He types in the month names July to December (using three-letter abbreviations, `Jul`, `Aug` etc.) pressing Tab after each name.
5. He changes cell H9 to read `Paid to Dec` and widens column H so the text fits properly.



Company savings scheme 1992

	Jan	Feb	Mar	Apr	May	Jun	Paid to June	In
Bob	£20.00	£30.00	£60.00	£60.00	£60.00	£50.00	£280.00	0
Jane	£30.00	£40.00	£30.00	£50.00	£60.00	£30.00	£240.00	0
Jim	£30.00	£40.00	£50.00	£40.00	£40.00	£30.00	£230.00	0

	July	Aug	Sep	Oct	Nov	Dec	[redacted]	In
Bob	£20.00	£30.00	£60.00	£60.00	£60.00	£50.00	£280.00	0
Jane	£30.00	£40.00	£30.00	£50.00	£60.00	£30.00	£240.00	0
Jim	£30.00	£40.00	£50.00	£40.00	£40.00	£30.00	£230.00	0

6. He changes cell K9 to read `Bal. to Dec`.

Removing with Cut

Now, Jim deletes the incorrect savings figures (at the moment, they're just copies of the first six month's figures):

1. He selects the block B10><H12.
2. He chooses the **Edit/Cut** option (he could have used the keyboard short-cut Ctrl-X). The savings figures are removed from the block.

The Cut and Delete options remove everything from a cell, including any formatting information. This means that when Jim comes to enter some more savings figures into the blank cells, they will not be displayed as pounds and pence. The next time he enters a figure into that block it will be displayed as 40 (for example) instead of £40.00.

So, Jim sets the number format for this block:

1 He selects the block B10><H12.

2 He displays the Number format... dialogue box and fills it in so that numbers in this block are displayed to two decimal places with a pound sign in front. There are no numbers in the block yet!

Note: Cell height and width are not affected when you use Cut or Delete – these are properties of rows and columns, not individual cells. See *Changing the overall dimensions of a spreadsheet* on page 160 and *Resizing cells* on page 131.

Difference between Cut and Delete

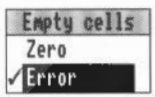
Both Cut and Delete remove data and effects from the selection. The difference is that after a Cut you can Paste or Move the data back into the Spreadsheet, or Paste it into another Advance application. Delete throws away the data (or formula) entirely.

Empty cell values

Here's some information Jim might find useful later on (he's not going to use it right now). It's a good idea to bear this in mind when deleting cells.

Because the Cut and Delete commands both destroy part of the spreadsheet, references from other parts of the spreadsheet to removed cells are no longer valid.

When a cell is empty, its content is normally taken as zero for calculation purposes. However if you want to guard against using empty cells by mistake, choose the **Utilities/Empty cells/Error** option:



When **Error** is set, Advance Spreadsheet will warn you whenever it tries to access the contents of an empty cell. The following error message is displayed:

```
Reference to undefined cell
```

Note: This affects the whole spreadsheet; you can't set some cells to be zero when empty and others to be Error.

Moving a cell or block

Now Jim's going to move some blocks of cells to different positions in the spreadsheet, but keep the logic of all the formulæ the same.

This is so he can carry the balances from the first half of the spreadsheet forward to the beginning of the second half. He'll do this in the next section, but first needs to move a block of cells to make room:

1. Jim highlights the block B4 to K12.
2. He chooses the **Edit/Cut** option.
3. He wants to move the block one cell to the right, so he selects cell C4.

   (In general, the cell you choose as the starting position for a moved block can be either within or outside the original highlighted block.)
4. Now he chooses the **Edit/Move** option. The block is now replaced in the spreadsheet, but it's moved one cell to the right:

Jan

C4

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2	Company savings scheme 1992											
3												
4			Jan	Feb	Mar	Apr	May	Jun	Paid to June	Int. Rate	Interest	Bal. to June
5	Bob		£20.00	£30.00	£60.00	£50.00	£60.00	£50.00	£280.00	0.1	£28.00	£308.00
6	Jane		£30.00	£40.00	£30.00	£50.00	£60.00	£30.00	£240.00	0.1	£24.00	£264.00
7	Jim		£30.00	£40.00	£50.00	£40.00	£40.00	£30.00	£230.00	0.1	£23.00	£253.00
8												
9			Jul	Aug	Sep	Oct	Nov	Dec	Paid to Dec	Int. Rate	Interest	Bal. to Dec
10	Bob								£0.00	0.1	£0.00	£0.00
11	Jane								£0.00	0.1	£0.00	£0.00
12	Jim								£0.00	0.1	£0.00	£0.00
13												

Next, he decides to move the final balances so they're easier to see.

1. He **Cut**s the block L9><L12.
2. He selects cell L14 and chooses **Move**.
3. He changes the heading in cell L14 to `Final balance`.

4 He copies cells A10><A12 and pastes them, starting at cell K15.

	G	H	I	J	K	L	M
3							
4	May	Jun	Paid to June	Int. Rate	Interest	Bal. to June	
5	£60.00	£50.00	£280.00	0.1	£28.00	£308.00	
6	£60.00	£30.00	£240.00	0.1	£24.00	£264.00	
7	£40.00	£30.00	£230.00	0.1	£23.00	£253.00	
8							
9	May	Jun	Paid to Dec	Int. Rate	Interest		
10			£0.00	0.1	£0.00		
11			£0.00	0.1	£0.00		
12			£0.00	0.1	£0.00		
13							
14						Final balance	
15						£0.00	
16					Jane	£0.00	
17					Jim	£0.00	

Note: Be careful when pasting/moving a block. The block will overwrite any cells that are in its way.

Jim saves his spreadsheet and takes a short break. He'll start work again at *Copying the result of a formula into a cell or block* on page 152.

Difference between Paste and Move

Here's a brief aside – some background information that will help Jim understand an important concept.

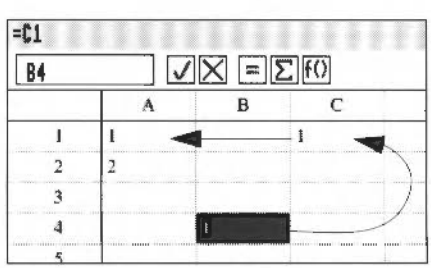
The main difference between Paste and Move is what happens to cell references and formulæ that use them. It's easiest to explain this difference with a simple example – try it yourself.

1 Open a blank spreadsheet, select cell A1, then choose **Error** from the **Utilities/Empty cells** option (see *Empty cell values* on page 149 for more on this).

2 Enter `1` into cell A1, and `2` into cell A2.

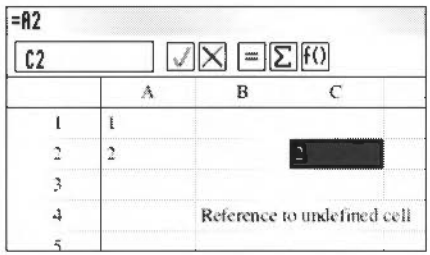
3 Next select cell C1 and enter `=A1`.

4 Next select cell B4 and enter `=C1`.



Cell C1 "points to" (refers to) cell A1
Cell B4 refers to cell C1

5 Now **Cut** cell C1 and **Paste** it into cell C2:

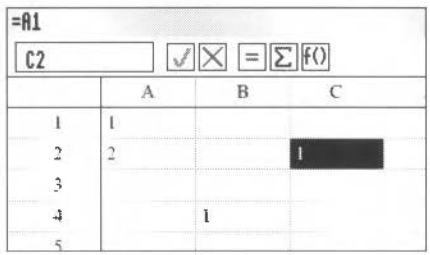


Cell C2 now refers to cell A2 – formula in C1 transferred and adjusted

Cell B4 still tries to refer to C1, which is now empty

With **Cut** and **Paste**, cell B4 does not know that the contents of C1 are now in C2, and so an error is given.

If you had chosen **Move** instead of **Paste**, the spreadsheet would have looked like this:



Cell C2 refers to cell A1 – formula in C1 transferred exactly

Cell B4 now refers to cell C2 – it has "followed" the moved cell

So, if you **Move** a cell, any other cells that refer (point) to it know that it has moved and can refer to its new position. This doesn't happen with **Paste**.

That's the end of this aside. Jim can get back to work now.

Copying the result of a formula into a cell or block

Now Jim wants to carry forward the balances from the end of June. He wants to put the balances in cells B10 to B12. Here's how he does it.

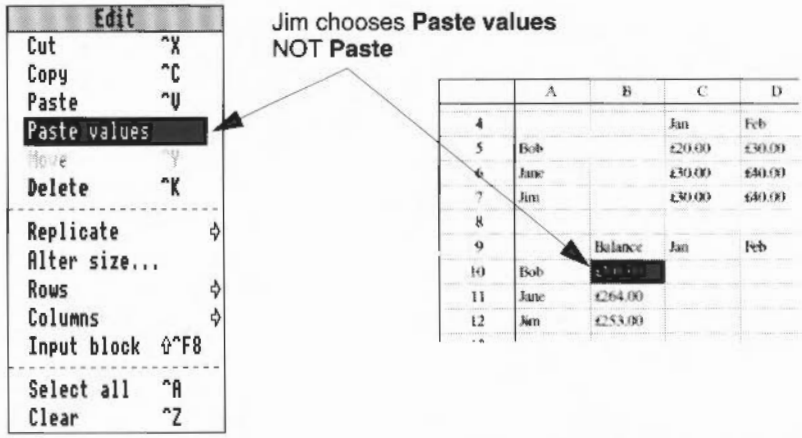
1 He enters the heading `Balance` into cell B9.

2 He selects cells L5 to L7.

3 He presses Ctrl-C to copy the block's contents.

4 He selects cell B12.

5 He chooses the **Edit/Paste values** option.



Now cells B10><B12 contain just the **results** of the formulæ in cells L5><L7.

Note: Jim couldn't simply use **Paste** in this case. That would have copied the formulæ in cells L5><L7 into cells C11><C13, which would be wrong because:

- The formulæ would have been copied and adjusted, but the cells they referenced would not (so they would use the wrong data).

  (There is a way Jim could have got around this problem – see *Defining a fixed reference* on page 155.)
- In this case, the adjusted formulæ would have tried to reference cells to the **left** of column A, which is impossible.

Editing existing data or formulæ (Edit mode)

There is one more correction Jim needs to make. The final balances are wrong at the moment, because they don't take the first six months' savings into account. Here's how Jim corrects them:

1 Jim selects the block L15><L17.

2 He clicks on the Edit mode button, then on cell B10.

3 He clicks on the Enter button and chooses Accept when asked to confirm the block fill. Now Jim's final balance (for example) is calculated like this:

```
Jim's final balance =
      amount paid in Jul to Dec          (=I12)
      + interest earned in Jul to Dec    (=K12)
      + balance brought forward from Jun (=B12)
```

Jim saves his spreadsheet MMSavings. He's finished with it now. He can tell Bob that so far he's paid £280.00 into the savings scheme, and earned £28.00 interest, giving him a total of £308.00.

The next couple of sections contain some more background information that it's well worth knowing about. Jim's going to take a rest and start a new spreadsheet in *Designing a more complicated spreadsheet* on page 158.

Other ways of getting into Edit mode

There are actually five ways of entering Edit mode (in each case, the Edit mode button's icon changes to a pointer):

- Selecting a cell or block and pressing the Edit mode button (as Jim has done above).

  The cursor appears at the end of the Entry area.

- Selecting a cell or block and pressing F2 (as Jim has done above).

  The cursor appears at the end of the Entry area.

- Double-clicking on a cell.

  This only allows you to edit one cell at a time, not a block. The cursor appears at the end of the Entry area.

- Selecting a cell or block and typing a character or pressing Delete.

  Whatever you type appears at the end of the existing data or formula, and will affect every cell in the selection when you apply the change. (Note: If the current selection is empty, pressing Delete **won't** put you in Edit mode.)

- Selecting a cell or block and clicking in the Entry area.

  The cursor appears wherever you click in the Entry area (not necessarily at the end, as above) so you can start editing a formula half-way through if you wish.

Leaving Edit mode

There are three different ways of leaving Edit mode:

- Click on the Enter button.
  This enters the contents of the Entry area into the selection, leaving the current selection highlighted.
- Press Return or Tab.
  This enters the contents of the Entry area into the selection and selects the next cell down or to the right.

- Click on the Cancel button.
  This leaves Edit mode without applying any of your changes to the current selection.

Defining a fixed reference

Earlier, when Jim was carrying forward savings figures to a new column, he needed a way of copying a cell's contents without Advance Spreadsheet adjusting the formula in that cell automatically. He used **Paste values** to copy the result from the cell, but not its formula.

Jim could instead have defined a **fixed reference** to the cell. That way, if for any reason the value **or the formula** in the cell had changed, the reference would have been updated. The fixed reference would always refer to the same fixed cell position.

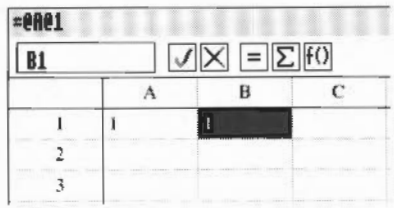
Jim's still taking a bit of a breather. Have a go at the next two examples yourself. They illustrate how fixed references work.

Example 1

1 Open a new blank spreadsheet.

2 Enter `1` in cell A1.

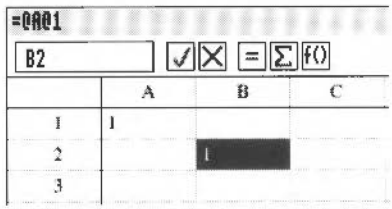
3 Enter `=@A@1` in cell B1 (the @ sign is the symbol for a fixed reference):



Now, let's see what happens when you move either of these cells:

1 Select cell B1 and choose **Edit/Cut**.

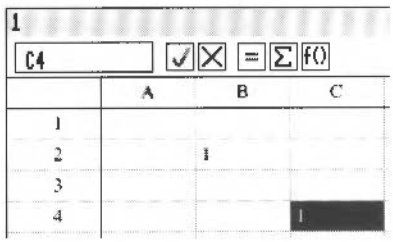
2 Select any other cell (cell B2 for example) and choose **Edit/Paste** or **Edit/Move** (they have the same effect in this case).



Cell B2 now points to cell A1 because of the fixed reference

3 Now select cell A1 and choose **Edit/Cut**.

4 Select any other cell (C4, say) and choose **Edit/Move** (not **Edit/Paste**).



Cell B2 now points to cell C4 (notice that after cutting cell A1, cell B2 is undefined until you move A1 to C4)

Here's a description of what happens:

- If you Cut/Move **or** Cut/Paste a cell **containing** a fixed reference, it still points to the same cell (its formula is not adjusted).
- If you Cut/**Move** a cell to which other cells refer (see *Moving a cell or block* on page 150) any fixed references now point to the new (**Move**d) cell position.
- If you Cut/**Paste** the contents of a cell to which other cells refer (see *Difference between Paste and Move* on page 151) the fixed reference is lost: those other cells would still point to the original cell position, which would now be empty.

You can quit this spreadsheet without saving it.

Example 2

You can fix one or both parts of a reference, leaving the other part to be adjusted when the formula is copied (e.g. @A1, A@1, or @A@1). Create a new spreadsheet and try the following example, which will display a full set of multiplication tables (up to 12 x 12). You might have to think a bit to see how this works!

1 Select a cell (it doesn't matter which one) and add 2 extra columns.

2 Enter the following:

Cell or block	Enter this:	
A1	=1	
B1><L1	=A1+1	this formula will be adjusted for position
A2>< A12	=A1+1	this formula will be adjusted for position
B2><L12	=B@1*@A2	only parts of this formula will be adjusted

Here's what the resultant spreadsheet looks like.

L14 ☑ ☒ = Σ f()

	A	B	C	D	E	F	G	H	I	J	K	L
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144
13												

You can quit this spreadsheet without saving it (unless you can't remember your multiplication tables!).

Jim's ready to get back to work now. He's going to start a new spreadsheet in the next section.

Designing a more complicated spreadsheet

Jim knows how to enter simple formulæ. Now he wants to perform more complicated calculations.

Note: This example is quite long and challenging (it runs until *Other spreadsheet features* on page 176) but it's worth persevering. It shows how versatile a spreadsheet can be. If you get lost trying to follow what Jim's doing, don't worry: Jim's saved this spreadsheet at various points in its development, so you can open one of his intermediate files and carry on from there. Just remember to look out for the signs in the margin and open copies of the relevant files on the Data disc!

It might be that you aren't familiar with some of the mathematical concepts that Jim uses, but if you do exactly what he does you'll soon see what's going on.

Music Matters orders new stock once a month. Jim is going to use a spreadsheet to keep track of what is selling, and calculate how many instruments to order.

In a database file, Jane McCluskey (Music Matters' manager) has entered information about every model of instrument that Music Matters sells. This information covers the last six months. Jim reckons he'll be able to use some of this information to perform the necessary calculations.

Some thought is called for before Jim starts to create this spreadsheet. He lists some things that the spreadsheet will need. First, he decides what information exists in (or can easily be calculated from) Jane's database:

- How many of each instrument does Music Matters sell in a week, on average?
- How long will present stocks last?
- What is the delivery time for each instrument?

From this, he'll calculate how many instruments to order each month.

Read the following section before Jim gets started on his new spreadsheet. It contains some important and useful information that Jim will need to know as he works. Jim will actually start work on his new sheet in *Changing the overall dimensions of a spreadsheet* on page 160.

More about formulæ and functions

Before Jim starts putting data into his new spreadsheet, here are some guidelines on using formulæ and functions to perform calculations.

Formulæ

There is a detailed description on how to combine mathematical expressions into formulæ in *Appendix E: Using expressions in Advance Spreadsheet* on page 323. Here's a brief introduction:

You can combine numbers using standard mathematical symbols, such as: ^ (power), +, –, * (times) and / (divide). Multiplications and divisions take place before additions and subtractions, but you can alter the order by using brackets; anything inside brackets is evaluated first. Brackets are free – use them if you are in any doubt as to the order in which an expression will be evaluated.

You can build formulæ from

- numbers and text strings
- values in other cells
- standard functions
- conditional expressions (see *Using conditional expressions in a formula* on page 170).

Formulæ are 'bolted together' using algebra, much like simple sums. Here are some typical formulæ:

Formula	**Action**
A1+1	add one to the contents of cell A1
B3*3+C5/7	multiply cell B3 by three and divide cell C5 by seven and then add the two results.
(B3+B5)*(B3–B5)	first add cell B3 to cell B5, then subtract cell B5 from cell B3; finally multiply together the two results.

Functions

A function is a special type of formula that takes one or more **arguments** (a mathematical term for information that you supply) performs some operation on them and then returns a result. You can use functions on their own, or as part of more complicated formulæ.

Advance Spreadsheet has a wide selection of standard functions for trigonometrical, algebraic and other types of calculation (Jim will use some in *Using Time functions in a formula* on page 167). You can see all the standard functions that are available by clicking on the Function button (**f()**). They are all explained in detail in *Appendix F: Using Advance Spreadsheet functions* on page 333 and *Appendix G: Spreadsheet functions reference* on page 341.

For example, you can use the function **Sqrt** to work out square roots. Standard functions are followed by their arguments in brackets, like this:

```
Sqrt(B2+B3)
```

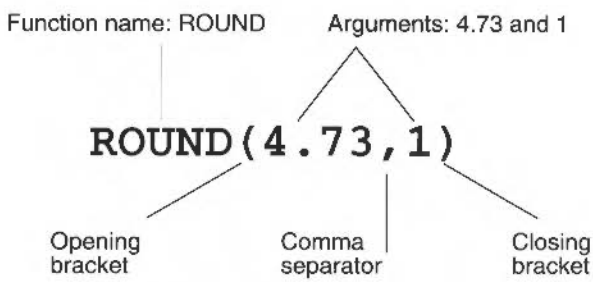
This means 'display in the selected cell the square root of (B2 + B3)'.

You can find out about other functions, and how to use them, in *Appendix F: Using Advance Spreadsheet functions* on page 333 and *Appendix G: Spreadsheet functions reference* on page 341.

Here are some examples of commonly used functions:

Function	Action
SUM(A1><A3)	Adds the cells A1, A2 and A3
AVERAGE(A1><A3)	Calculates the average of cells A1 to A3
LEN("Publications")	Counts the number of characters in the text string Publications.

You use functions by entering them into the entry area. The rules for writing a function in an expression are called **syntax**. All functions have the same basic syntax as the following function, which rounds the number 4.73 to one decimal place:

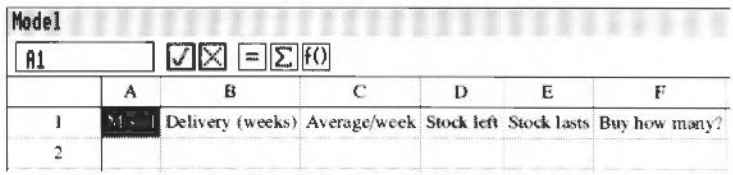


Function arguments can be numbers, text, arrays, error values, cell references or other formulæ. The argument you give can be anything that returns the correct data type for the function.

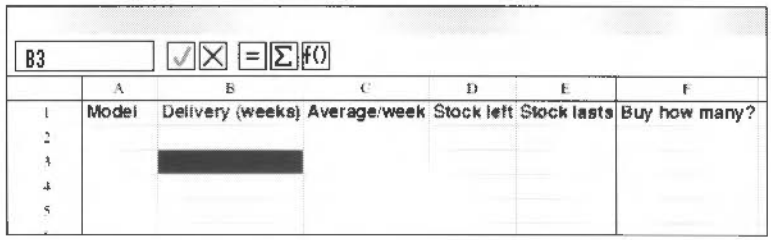
That's enough about formulæ and functions for the time being! Don't worry too much if you didn't understand all the terms in this section – you'll soon pick up what Jim's doing. Now it's time for him to start work on his new spreadsheet.

Changing the overall dimensions of a spreadsheet

To get started, Jim opens a new spreadsheet and fills in some column headings:



He changes the headings to Homerton bold, 14pt, in red, and widens the columns:



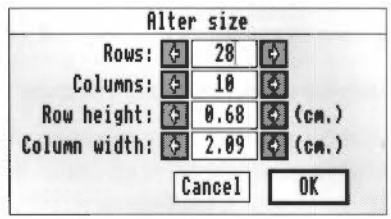
He saves this spreadsheet, calling it `MMOrders`. (If you're copying what Jim does, save your file to your work disc and call it something else.)

Adding or deleting rows and columns

Before using functions and formulæ in his spreadsheet `MMOrders`, Jim needs change its size, so he'll have enough room for all the data and calculations.

The default size for a new spreadsheet is 28 rows by 10 columns. Jim is going to need more rows than this (Music Matters sells 42 different instruments, so Jim will need 43 rows, including headings) but he's only using six columns.

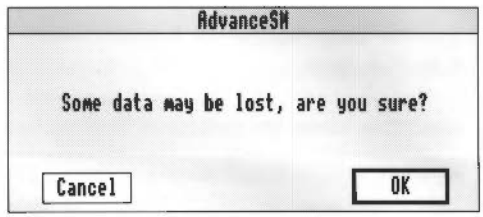
1 He clicks Menu over the spreadsheet window and chooses **Edit/Alter size...**. This displays the Alter size dialogue box:



2 He changes the Rows box to read 43 and the Columns box to 6.

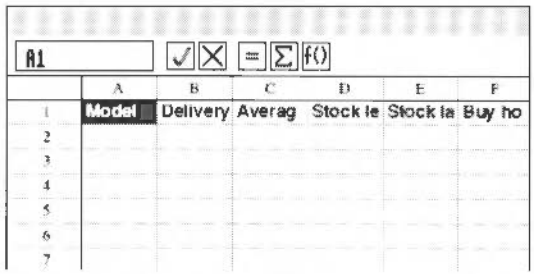
3 He clicks on **OK**.

A message appears warning him that he may lose some data:



4 Jim clicks on **OK**. (Note 1 overleaf explains why Jim can ignore the message.)

The number of rows and columns in the spreadsheet changes accordingly, but the column widths have been set back to their original (default) sizes:



The columns are now too narrow for the headings

5 Jim double-clicks on the column headers for columns B, C, D, E and F in turn to make sure that the text fits again.

6 The spreadsheet is going to be quite large, so Jim presses F11 and scales the spreadsheet so he's viewing it at 80% of its full size.

7 He saves his spreadsheet again.

Note 1: Using the Alter size box, rows and columns are added to or deleted from the **end** of the spreadsheet (i.e. the righthand column or the bottom row). In Jim's sheet, the four columns he deleted were empty.

Note 2: You can also add or delete rows or columns using **Edit/Rows** or **Edit/Columns** options (for example, see *Adding rows and columns* on page 111). If you add rows or columns this way, they will be inserted **after** the current selection.

Problems when deleting columns

Be careful when you are deleting columns: if you delete too many columns, the spreadsheet window will shrink so that, for example, you will not be able to see any error messages. One way round this is to scale the view (use the F11 short-cut) so that you're viewing the spreadsheet at 200% of its actual size.

Changing the height and width of rows and columns

You can also use the Alter size... dialogue box to change the height and width of rows and columns (but remember it makes **all** rows or columns the same size).

You can also change the height of rows or columns using **Edit/Rows** or **Edit/Columns**.

Inserting rows (or columns) before row 1 (or column 1)

Rows or columns are always inserted **after** the currently selected row, column or cell. If you want to insert a new row **before** the existing row 1, start by inserting a new row after row 1, then Cut and Move the existing row 1 into it. This will give you a blank row 1. The same principle applies to adding a new column 1.

Copying data from another spreadsheet

Jim needs to use the information in Jane's database. Luckily, Jane has imported her database file into a spreadsheet of her own, called `JanesSheet` (*Saving* CSV *and* TSV *files* on page 260 of *Learning more about the Database* tells you how to import data from Advance Database to a spreadsheet file).

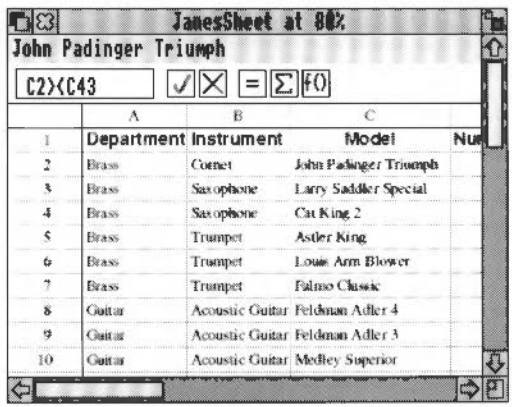
Copy the file `Jim_D` (in the `SHtutorial` directory on Data disc A) to your work disc and open it now if you want to see what Jim's spreadsheet looks like when he's copied everything he needs from Jane's sheet (this takes him up to the beginning of *Locking and unlocking a row or column* on page 167).

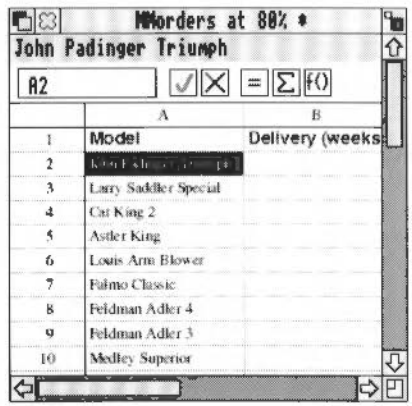
Jim opens the spreadsheet `JanesSheet`. There's a copy of it on Data disc A.

Jim wants the first column of his spreadsheet to show the different instrument models, so he copies the instruments in column C from Jane's spreadsheet:

1. He selects cells C2 to C43 in Jane's spreadsheet.
2. Next he chooses **Copy** from the Edit menu.
3. Now Jim brings his own spreadsheet's window to the front and selects cell A2.
4. He chooses **Paste** from the Edit menu.
5. He widens column A so the names fit.

   Column A in his sheet is now the same as column C in Jane's sheet:





Now seems a good time for Jim to save what he's done so far.

Using references to another spreadsheet

The next three columns in Jim's spreadsheet will contain the following information:

- The delivery time in weeks.
- The average number of each instrument sold per week.

  To calculate this, Jim needs to know the total number sold in the six months. This data is in column D of Jane's spreadsheet.
- The number of weeks that the instruments remaining in stock will last, assuming that they sell at the average rate above.

  For this calculation, Jim needs to know how many instruments are in stock right now. This data is in column F of Jane's spreadsheet.

Thinking ahead, Jim realises that Jane will update her spreadsheet every month. So, the data he wants to use will change (as more instruments are sold, and instruments that have already been ordered arrive).

Jim can use this fact to his advantage. Instead of just copying the columns from Jane's spreadsheet straight into his own, he can use references to the cells in Jane's spreadsheet that will change.

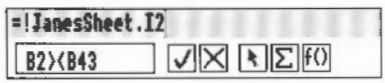
This works in exactly the same way as a reference to a cell or block in Jim's own spreadsheet. When Jane next changes her spreadsheet, Jim can automatically incorporate these changes into his spreadsheet.

For now, Jim just enters the references into his spreadsheet. He'll use them in calculations in the next section. This is how he enters the references:

1 First Jim selects cells B2 to B43 in his own sheet, `MMOrders`.

2 Next, he clicks on the Edit mode button.

3 Now he brings Jane's spreadsheet to the front and clicks on cell I2. The Entry area in his own spreadsheet now looks like this:

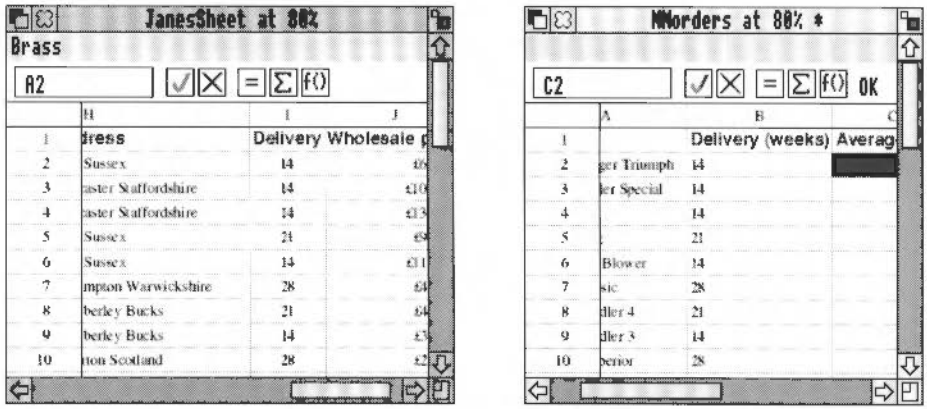


The exclamation mark shows that this is a reference to another spreadsheet. The name before the full stop indicates which spreadsheet is being referenced. The actual cell being referenced appears after the full stop.

4 Jim now clicks on the Enter button, then clicks on **Accept** when the spreadsheet asks him to confirm that he wants to change the block.

Advance Spreadsheet treats cell I2 as the **start** of a block. All the cells in Jim's column B are filled with references to the correct cells in column I of Jane's spreadsheet, adjusted for position.

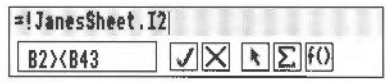
Jim's column B looks exactly the same as Jane's column I (except for the title!).



Column B in Jim's spreadsheet still shows the delivery time in days. This is how he changes the numbers to show the delivery time in weeks:

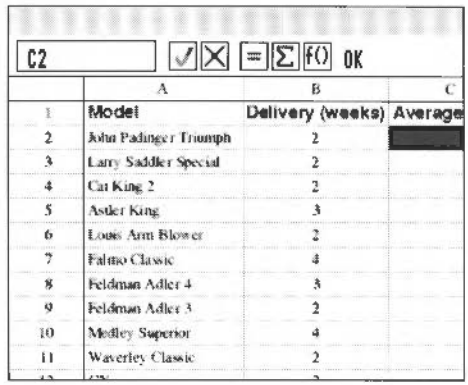
1 Jim selects the block B2><B43.

2 He presses F2 to go into Edit mode. The cursor appears at the end of the Entry area and the Edit mode button's icon changes to a pointer.



3 Then he types /7 and clicks on the Enter button. He clicks on **Accept** when asked to confirm that he wants to modify the block. Column B now shows the delivery time in weeks.

4 With column B still selected, Jim presses Ctrl-F6 (the short-cut to centre text) then presses F8 and sets the number format to Integer:



Now Jim enters references to Jane's column D in his own column C.

1 First Jim selects cells C2 to C43 in his own sheet.

2 Next, he clicks on the Edit mode button.

3 Then he brings Jane's spreadsheet to the front and clicks on cell D2.

4 Then he clicks on the Enter button, and clicks on **Accept** when the spreadsheet asks him to confirm that he wants to change the block.

5 He presses Ctrl-F6 to centre the text in the column.

Then, using the above method, he enters references to Jane's column F to his column D, and centres that text. His spreadsheet looks like this so far:

=!JanesSheet.F2

D2 OK

	A	B	C	D	E	
1	**Model**	**Delivery (weeks)**	**Average/week**	**Stock left**	**Stock lasts**	**Buy**
2	John Padinger Triumph	2	9	[redacted]		
3	Larry Saddler Special	2	8	2		
4	Cat King 2	2	11	1		
5	Astler King	3	7	2		
6	Louis Arm Blower	2	6	2		
7	Falmo Classic	4	3	2		
8	Feldman Adler 4	3	14	2		
9	Feldman Adler 3	2	21	5		
10	Medley Superior	4	11	3		
11	Waverley Classic	2	8	2		
12	GX	2	2	2		

The figures in columns C and D still need some calculations performed on them to make them mean what the column headings say! Jim will do this in a while (in *Using Time functions in a formula* on page 167). For now, he saves his spreadsheet again.

Updating references to other spreadsheets

Jim is not yet at the stage when he needs to update any references to Jane's spreadsheet, but it's worth mentioning now how he it's done. There are two ways of updating references:

- If Jane is just about to update her spreadsheet, she can open Jim's spreadsheet too. Then, any changes she makes will automatically appear in Jim's spreadsheet as she updates her own.
- If Jane has already updated her spreadsheet, Jim must open both spreadsheets, then select a cell in his sheet and choose the **Utilities/Recalculate sheets** option.

Locking and unlocking a row or column

Jim thinks it would save him some time if he could always tell which column a selected cell was in, without having to scroll back up to the top of his spreadsheet to remind himself of the column title.

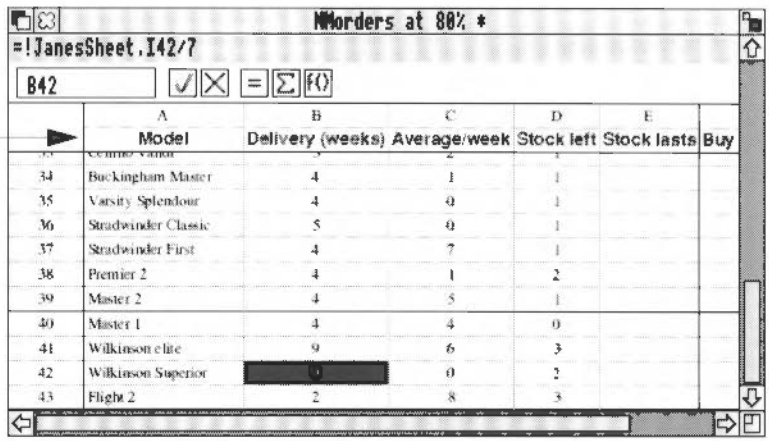
This is what he does:

1 First, he selects row 1, by clicking on the row label.

2 Next, he chooses **Edit/Rows/Lock rows**.

Now, when he scrolls down to the bottom of the spreadsheet window, the first row is locked (a copy of it remains immediately below the column headers) so that it stays in view all the time.

Jim can still see row 1, even though he's scrolled to the bottom of the sheet



You can also lock a column in the same way. If you decide later on that you don't need a row or column to be locked any more, choose the **Edit/Rows/Free rows** or **Edit/Columns/Free columns** option.

Using Time functions in a formula

Note: Don't worry if, in following this part of Jim's example, you get different results! Jim is going to use a time function that takes account of the actual date when he works on the spreadsheet. This is bound to be different from the date on which you happen to be reading this example and trying to copy what Jim does.

Column C in Jim's spreadsheet only contains data at the moment (even though that data comes from another spreadsheet). Jim now wants to perform some calculations with that data.

Copy the file `Jim_E` (in the `SHtutorial` directory on Data disc A) to your work disc and open it now if you want to see what Jim's spreadsheet looks like when he's calculated the values in column C properly (this takes him up to the beginning of *Using conditional expressions in a formula* on page 170).

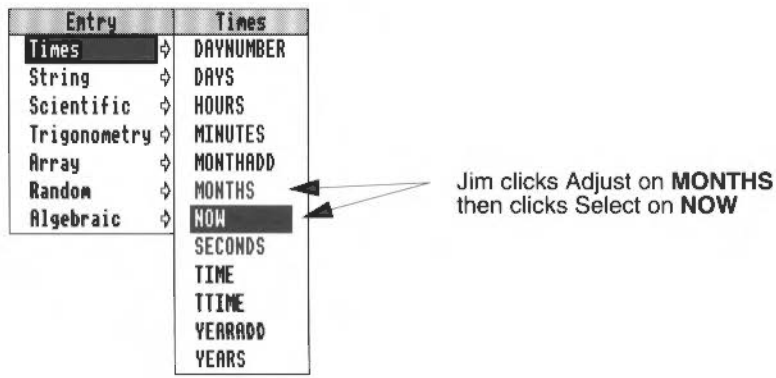
What he has in column C at the moment is the total number of each instrument sold in six months. What he actually wants is a formula to calculate the average number sold per week. For example, to find out the average number of John Padinger Triumph cornets sold per week, he must divide the contents of cell C2 by the number of weeks that have passed so far this year.

However, when Jane updates her spreadsheet next month, the total numbers of each instrument sold will hopefully increase. So, next month, to calculate the averages properly, Jim's formula will have to change (to take account of the extra month). Jim can use special functions to do this automatically.

Here's how Jim enters the formula:

1. First, he highlights cells C2 to C43.
2. He clicks on the Edit mode button. The caret appears at the end of the Entry area.
3. Jim types a slash followed by an opening bracket:

   (the slash is the symbol for division).
4. Next, Jim clicks on the Function button and moves into the Times menu.
5. He chooses **MONTHS** by clicking Adjust (to leave the menu displayed).
6. Then he chooses **NOW** by clicking Select.



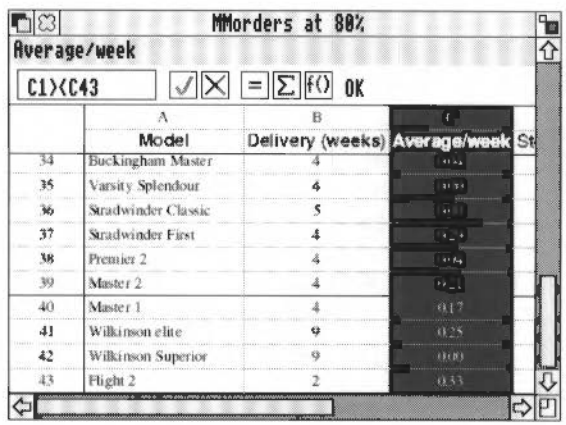
7 Then he moves the cursor two places to the right and types
*4)
Note the closing bracket. The Entry area looks like this:

The formula means "Jane's cell D2 divided by the number of weeks that have gone by so far this year" (assuming that Jim does his calculations at the end of the month!).

8 Jim clicks on the Enter button to enter his formula. He clicks on **Accept** when asked to confirm that he wants to change the block.

9 Finally, Jim uses the **Effect/Number format...** option to show all the numbers in this column as Fixed decimals, to two decimal places (see *More about number formats* on page 178 for more on this).

Now column C shows the average number of each instrument sold in a week.



	A	B	C	
	Model	Delivery (weeks)	Average/week	St
34	Buckingham Master	4		
35	Varsity Splendour	4		
36	Stradwinder Classic	5		
37	Stradwinder First	4		
38	Premier 2	4		
39	Master 2	4		
40	Master 1	4	0.17	
41	Wilkinson elite	9	0.25	
42	Wilkinson Superior	9	0.03	
43	Flight 2	2	0.33	

Jim saves his spreadsheet now, and takes a breather.

MONTHS and NOW are just two of the functions you can use in calculations to do with time. There is some more information on how to display Times functions in *More about number formats* on page 178. You'll find a full description of all the Times functions in *Appendix F: Using Advance Spreadsheet functions* on page 333 and *Appendix G: Spreadsheet functions reference* on page 341.

In this case, it happens that Jim has supplied a second function (NOW, which needs no arguments) as the argument to the first function (MONTHS). The result of this combined function is a number between one and twelve which indicates how many months have passed so far this year. Jim multiplied that by four to give the number of weeks (roughly).

Advance Spreadsheet has many more functions available to make calculations easier. Jim will use a few more in this spreadsheet. You can find out about the rest, and how to use them, in *Appendix F: Using Advance Spreadsheet functions* on page 333 and *Appendix G: Spreadsheet functions reference* on page 341.

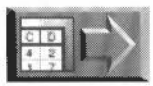
Updating spreadsheets that use Times functions

The Times functions use the computer's internal clock to keep track of the current time and date. Next month, when Jim opens his spreadsheet, all he has to do is choose the **Utilities/Recalculate sheets** option, and his formula will automatically calculate averages over seven months instead of six.

Note: In this case, Jim's spreadsheet also contains references to another spreadsheet, `JanesSheet`. Jim must open this other spreadsheet before using the **Recalculate sheets** option, otherwise each cell that refers to `JanesSheet` will show an error message like this:

```
Reference to non-existent spreadsheet
```

Using conditional expressions in a formula



Copy the file `Jim_F` (in the `SHtutorial` directory on Data disc A) to your work disc and open it now if you want to see what Jim's spreadsheet looks like when he's calculated the values in column E (this takes him up to the beginning of *Calculating how many instruments to buy* on page 172).

Calculating how long present stocks will last

In column E Jim wants to calculate how many weeks present stocks of instruments will last, assuming that they sell at the average rate in column C.

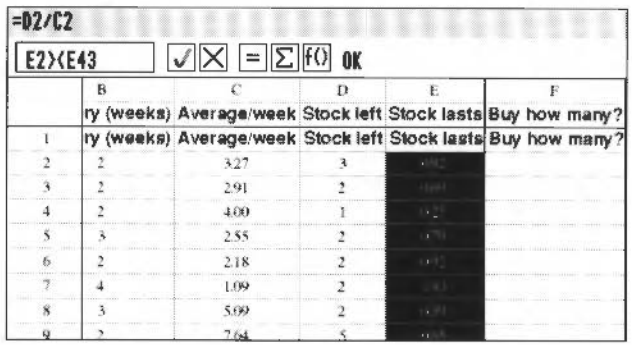
The formula for this is quite simple:

No. weeks stock lasts = Stock left / Average rate

For example, there are enough John Padinger Triumph cornets left to last 3 / 0.37 = 8.1 weeks (or eight weeks, to the nearest week). Jim fills in column E:

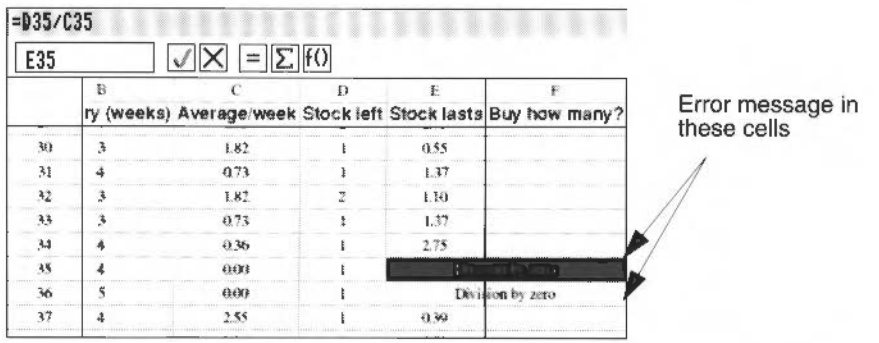
1. He selects cells E2><E43.
2. He clicks on the Edit mode button and types `D2/C2`.
3. He clicks on the Entry button and **Accept**s the block fill.
4. With the block still selected, he presses F8 and changes the number format so that numbers are displayed as fixed decimals, correct to two decimal places.

5 He presses Ctrl-F6 to centre the numbers in the column.



	B	C	D	E	F
	ry (weeks)	Average/week	Stock left	Stock lasts	Buy how many?
1	ry (weeks)	Average/week	Stock left	Stock lasts	Buy how many?
2	2	3.27	3		
3	2	2.91	2		
4	2	4.00	1		
5	3	2.55	2		
6	2	2.18	2		
7	4	1.09	2		
8	3	5.09	2		
9	2	7.64	5		

Column E now shows how long present stocks of each instrument will last. However, Jim notices some of the cells in column E have an error message in them:



	B	C	D	E	F
	ry (weeks)	Average/week	Stock left	Stock lasts	Buy how many?
30	3	1.82	1	0.55	
31	4	0.73	1	1.37	
32	3	1.82	2	1.10	
33	3	0.73	1	1.37	
34	4	0.36	1	2.75	
35	4	0.00	1		
36	5	0.00	1	Division by zero	
37	4	2.55	1	0.39	

The spreadsheet cannot divide a number by zero, and some of the cells in column C contain zeros. Here's how Jim solves this problem:

1 With cells E2><E43 selected, Jim presses F2 to go into Edit mode. The cursor appears at the end of the Entry area.

2 He presses Ctrl-U to delete the present formula, then types
`=IF C2=0 THEN 0 ELSE D2/C2 ENDIF`

3 He clicks on the Entry button, and **Accept**s the block fill. The new formula is copied into each cell in column E, and adjusted for position.

Jim has used his first **conditional expression**. In this case it means "If cell C2 contains a zero then place a zero in cell E2, otherwise place the result of D2/C2 in cell E2".

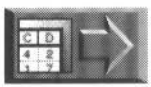
Here's the pattern you need to remember when writing conditional expressions:

- Between IF and THEN you write a condition, that is, an expression which you expect to be true in some cases, or false in others.
- Between THEN and ELSE put an expression which you want to be used if the condition is true.
- Between ELSE and ENDIF put an expression which you want to be used if the condition is false.
- You must enclose any text in conditional expressions in double quotes.
- Conditional statements can be nested (Jim will write a nested conditional expression in the next section). In that case, all the ENDIFs go at the end of the expression. As a guide, you must have as many ENDIFs as there are THENs!

IF, THEN, ELSE and ENDIF can be in lower case if you prefer. There's more on conditional expressions in the next section.

Calculating how many instruments to buy

Now Jim's spreadsheet contains all the information he needs to work out how many instruments to buy each month.



Copy the file `MMOrders` (in the `SHtutorial` directory on Data disc A) to your work disc and open it now if you want to see what Jim's spreadsheet looks like when he's calculated the values in column F (this takes him up to the beginning of *Other spreadsheet features* on page 176).

First of all, Jim needs to know what formula to use. He's done a bit of background work and come up with the conditions that determine how many of each instrument to order:

1. If his current stock will last at least four weeks after the next delivery time, he doesn't need to order any now.
2. If the present stock will last beyond the next delivery, but not until he re-orders, he needs to order four weeks' stock **less** the amount of his **current** stock he will have left after the next delivery.
3. If the present stock will run out before the next delivery **and** before he re-orders, he needs to order four weeks' stock.

As an example, looking at row 2 in his spreadsheet, Jim decides this is how he should calculate how many John Padinger Triumph cornets to buy:

1 If `(E2-B2) ≥ 4` then don't buy any

2 If `4 > (E2-B2) > 0` then buy `(4-(E2-B2))*C2`

3 If `(E2-B2) ≤ 0` then `buy 4*C2`

(Cell B2 = delivery time in weeks
Cell C2 = average number sold per week
Cell E2 = number of weeks present stock lasts (which = stock left/C2))

Now Jim has the problem of how to enter this into his spreadsheet! It's not a simple formula, but Advance Spreadsheet can understand formulæ with nested (multiple) conditions in, as long as they're entered according to the special pattern on the previous page. This is how Jim goes about it:

1 First, Jim selects cells F2><F43.

2 He clicks on the Edit mode button, and types the following after the = sign:

```
IF (E2-B2) >= 4 THEN 0 ELSE IF 4 > (E2-B2) > 0 THEN
(4-(E2-B2))*C2 ELSE 4*C2 ENDIF ENDIF
```

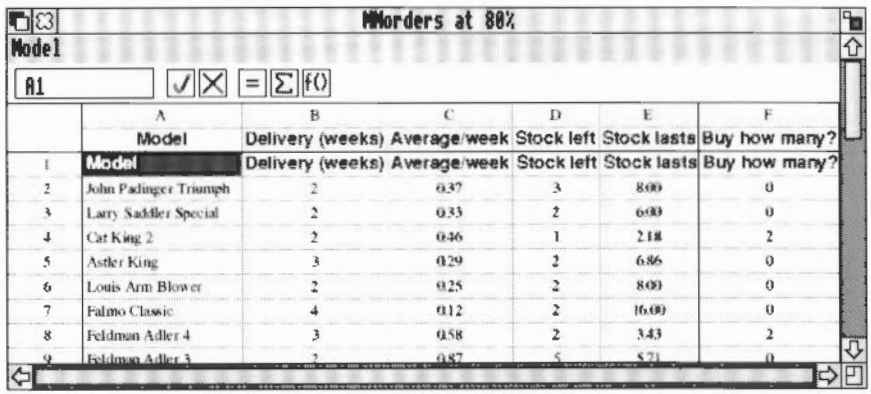
Notes: Jim has to type this all on one line. He enters the cell references by clicking on the cells to save typing them.

(If you make mistakes typing in this rather long formula, you can edit or correct it later. If you can't see the bit of the formula you want to change – the formula is much longer than the Entry area – move the cursor with the left and right arrow keys when you're in Edit mode.)

3 He clicks on the Enter button, then **Accept**s the block fill.

4 He presses F8 and changes the number format so that these numbers are displayed as integers (he can only order a whole number of instruments!)

Jim's spreadsheet now looks like this:



	A	B	C	D	E	F
	Model	Delivery (weeks)	Average/week	Stock left	Stock lasts	Buy how many?
1	Model	Delivery (weeks)	Average/week	Stock left	Stock lasts	Buy how many?
2	John Padinger Triumph	2	0.37	3	8.09	0
3	Larry Saddler Special	2	0.33	2	6.00	0
4	Cat King 2	2	0.46	1	2.18	2
5	Astler King	3	0.29	2	6.86	0
6	Louis Arm Blower	2	0.25	2	8.00	0
7	Falmo Classic	4	0.12	2	16.00	0
8	Feldman Adler 4	3	0.58	2	3.43	2
9	Feldman Adler 3	2	0.87	5	5.71	0

Jim can see, for example, that this month he doesn't need to order any John Padinger Triumph cornets, but he needs to order two Cat King 2 saxophones.

He saves his spreadsheet again, and takes a rest. He's got one last thing to do before he's finished with this sheet for this month (in *Protecting cells* on page 175). Until then, here's a bit more useful information on using expressions:

Entering text and special characters in expressions

There are two special cases that you must consider when entering expressions: text strings and special characters.

Text strings

If you want text to appear as part of a conditional expression, you must enclose it in quotes.

For example, if Jim had wanted the word None (instead of a 0) to appear in the Spreadsheet, to signify that he need not order a particular instrument, he would have typed in his formula like this:

```
IF (E2-B2) >= 4 THEN "None" ELSE IF 4 > (E2-B2) > 0 THEN
(4-(E2-B2))*C2 ELSE 4*C2 ENDIF ENDIF
```

Special characters

The characters " and \ have special meanings to Advance Spreadsheet. To include either character in an expression (i.e. to make either character appear in a cell as part of a result of a formula) place a \ (backslash) immediately in front of the character.

For example, if Jim had wanted the word None to appear **in quotes** in his spreadsheet, he would have written it like this in his expression:

```
"\"None\""
```

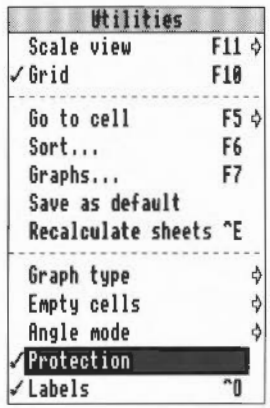
Protecting cells

Now that Jim has successfully entered a rather complicated formula, he wants to make sure that he can't change it by accident. He decides to **protect** the cells containing the formula:

1 He selects the block F2><F43.

2 He clicks on the **Utilities/Protection** menu.

A tick appears next to the menu option, indicating that protection is enabled on these cells.



This now means that Jim cannot alter the contents of any of the cells in the selected block. If he tries to edit one or more of the cells while protection is enabled, he will see the following error message:

```
One or more cells are protected
```

Note: You can protect as many blocks in a spreadsheet as you want by repeating this procedure. When a cell is protected, the value of the cell will still be altered if it is dependent on another cell.

Turning off cell protection

All Jim has to do if he wants to be able to edit his formula once more is select the relevant cells and choose the **Utilities/Protection** menu option again. The tick will disappear and protection will be turned off.

Jim has now finished with his spreadsheet `MMOrders` for the time being. Next month he'll be able to tell at a glance how many instruments to order. This should save him a good deal of time. Jim saves the spreadsheet and quits it.

Remember!: Next month, when Jim wants to update this sheet, he'll have to open `JanesSheet` too, select a cell in his sheet and press Ctrl-E (the short-cut for the **Utilities/Recalculate sheets** option).

Other spreadsheet features

This section describes spreadsheet features that Jim hasn't used yet.

More on sorting

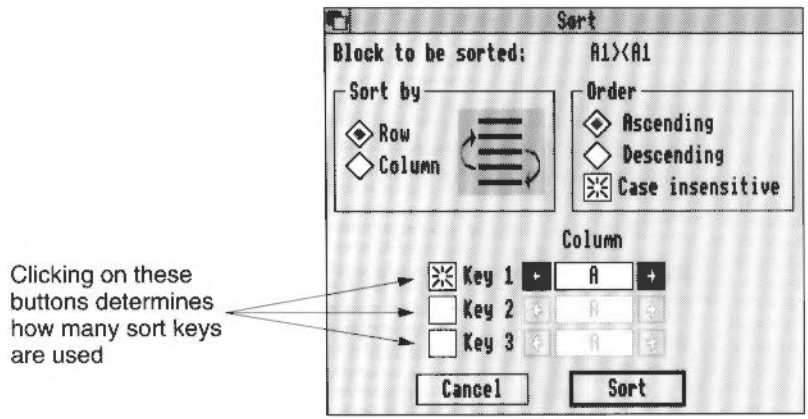
Defining a sort order

Sort **order** defines whether the sort is in ascending or descending sequence. **Ascending** sorts in ascending numeric sequence (1-9 etc.) and normal alphabetic sequence (A-Z).

If you choose **Case insensitive**, the sort order takes no account of the case of letters. If Case insensitive is **not** selected, the sort treats capital letters as lower in value than lower case letters.

Defining more than one sort key

When sorting by row (for example) you can define up to three key columns. That way, if two or more cells in your first key column are the same, the order of the sort will take account of the second key column. If two or more cells in the second key column are identical, then the sort order is governed by the third key column.



When sorting by **column**, the sort dialogue box changes automatically so that you can specify up to three key **rows**. When sorting by **row**, the sort dialogue box changes automatically so that you can specify up to three key **columns**.

Note: The key row or column must be part of the block to be sorted.

Text or numeric sort

There are actually two types of sort:

- text – sort by letter first (A, B, C... Z, 1, 2, 3...)
- numeric – sort by number first (1, 2, 3...A, B, C...).

The spreadsheet will automatically choose which type to perform, depending on the contents of the first cell in the key row/column.

Hint: Try and arrange your data so that any key rows/columns only contain text **or** numbers, not both.

Sorting blocks that contain references

Take special care when sorting blocks of cells that contain references to other cells (either in the same spreadsheet, or another one).

If the block to be sorted contains both the cells containing references and the cells they refer to, there is no problem. On the other hand, if you're sorting a block that contains references to another spreadsheet, or a cell outside the current block, beware: unless you've defined fixed references, the sort will not work properly.

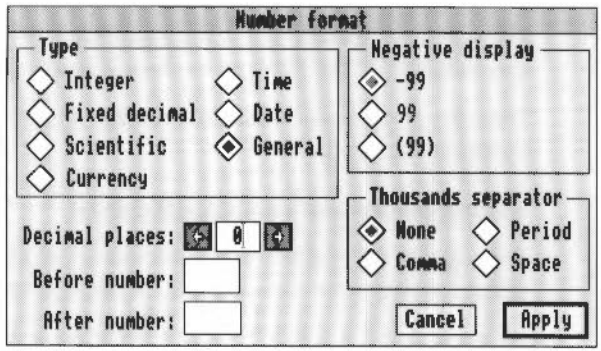
Sorting times and dates

When you sort a spreadsheet or part of a spreadsheet, you always sort on the **values** contained in cells. This may be different from what is actually displayed in cells:

> Under certain conditions, such as the date display format, the items which are shown in the cells are not the same as true values. As an example, consider two dates displayed in your spreadsheet as Wednesday 5th February 1992 and Thursday 6th February 1992. You have previously used the Number format option to change two time values into these date formats. If you sort these cells in increasing order, you get the dates arranged sequentially and correctly as their values indicate. If Advance Spreadsheet were to sort purely on what is displayed in the two cells, it would rank the string "Thursday" as coming before "Wednesday" – (T comes before W in the alphabet) – which is not the result you want.

More about number formats

The **Number format...** option lets you change the way numbers, times and dates are displayed in your spreadsheet. Jim has already used some of the options in the Number format dialogue box. Here's an explanation of what all the options do:



Setting the number Type

If you want to change the way a number is displayed in a cell, select the cell and choose a Type from the Number format box. For example, here are the different ways you can display the number 1234.56789:

Type	Description	Example
Integer	This displays numbers rounded to the nearest whole number.	1235
Fixed decimal	This displays numbers rounded to a fixed number of decimal places, which you can define in the **Decimal places** box.	1234.57 (2 dec. places)
Scientific	This displays numbers in scientific notation. You need to fill in the **Decimal places** box.	1.23e+03 (2 dec. places)
Currency	This displays numbers as monetary amounts – you can fill in the **Before number** and **After number** boxes when the Currency option is turned on.	e.g. £1234.57 (2 dec. places)
Time	See *Time and Date formats* on page 179	
Date	See *Time and Date formats*	
General	This displays numbers as accurately as possible, using as many decimal places as necessary. (The exception is when there are more than 15 digits in front of the decimal point – the number will be shown in scientific notation.)	1234.56789

Displaying negative numbers

There are three ways you can show negative numbers:

- with a minus sign in front, e.g. –1234.56789
- highlighted in red
- in brackets, e.g. (1234.56789).

Note: This does not affect the Type you have defined.

Thousands separator

You can choose one of four ways of showing numbers greater than 999 by having one of the following thousands separators:

None	1234.56789	
Comma	1,234.56789	
Period	1.234,56789	(the decimal separator changes to a comma)
Space	1 234.56789	

Text before and after numbers

You can place up to three characters before and after numbers that are displayed in Currency format. For example, you could have £1234.57DR to signify that you were overdrawn (by rather a large amount, in this case!).

Time and Date formats

You can use the Time and Date types to display temporal values. For example, here's how to insert the **current** date into a spreadsheet cell:

1. Select a cell.
2. Click on the Function button **f()**.
3. Choose the **Times/NOW** option.
4. Click on the Enter button.
   Initially, a long number appears in the cell (e.g. 62883081377). This is just the spreadsheet's internal representation of the current time and date.
5. Display the Number format box (press F8).
6. Choose the **Date** type and click on **Apply**.

To change this to the current time, change the Number format to **Time**. To update the current time or date, press Ctrl-E (**Recalculate sheets**).

Note: If you type in a date (e.g. 1 Jan 1993) to an empty cell that has a Date format, this will actually enter an internal representation number. If you want to see this number instead of the date, change the cell's number format to General.

Entering any time or date

You can enter any time or date into a spreadsheet cell. To do so, you must set the Number format of the cell to Time or Date **before** you enter anything. You can then enter your chosen time or date. Below are some valid ways of entering times and dates:

Enter this	Time displayed	Enter this	Date displayed
143624*	2:36:24 pm	101292	10th December 1992†
14,36,24‡	2:36:24 pm	10:12:1592	10th December 1592
2 36 24 pm	2:36:24 pm	1 Jan 87	1st January 1987
051506	5:15:06 am	1Jan1287	1st January 1287
5 15 06 am	5:15:06 am	3rd 3 45	3rd March 1945
051506	5:15:06 am	12th:04 90	12th April 1990

* If there are no separators or spaces between the fields, you must specify the time in 24-hour format (i.e. prefix hours before midday with a zero). If there are separators, you must specify pm if you want it, or am will be assumed.
† If you don't specify the century, the current century is assumed.
‡ You can use spaces, commas or any non-numeric characters as separators between fields.

Changing the default time and date formats

The default ways in which times and dates are displayed are actually set up in the file `!AdvanceSH!RunApp`. They are set by the variables `AdvanceSH$TimeFormat` and `AdvanceSH$DateFormat`. You can change these variables if you want.

The variables use the following date/time building blocks:

`%se`	seconds
`%mi`	minutes
`%12`	hours in 12 hour clock
`%24`	hours in 24 hour clock
`%am`	the string am
`%pm`	the string pm
`%we`	Weekday name in full (Monday)
`%w3`	Weekday name as three letters
`%wn`	Number of weekday (0 for Sunday)
`%dy`	Day in month
`%st`	'st', 'nd', 'rd', 'th' as appropriate for the date
`%mo`	Month name in full (September)

%m3	Month name as three letters
%mn	Month number (1 for January)
%ce	Century
%yr	2-digit year in century
%wk	Week number in year
%dn	Day number in year

These are the defaults that Advance Spreadsheet uses:

- Time format: `%z12: %mi: %se: %pm`
  (displayed in the form 8:02:06 pm)
- Date format: `%zdy%st %mo %ce%yr`
  (displayed in the form 9th September 1992)

For example if you were to use:

```
%we the %dy%st %m3 %yr
```

as a format, the cells would display temporal values in the form:

```
Wednesday the 9th Sep 92.
```

If you were to use:

```
%12:%mi:%se %pm
```

as a format, the cells would display temporal values in the form:

```
08:02:06 pm
```

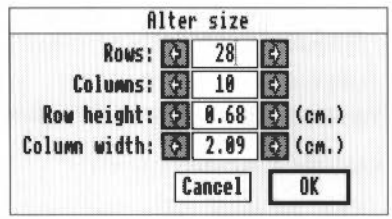
Where numbers are output, they are generated as fixed width, leading zero values (e.g. %mi gives a result of 02). To remove leading zeros, prefix the code with a z (e.g. %zmi gives a result of 2).

See *Appendix F: Using Advance Spreadsheet functions* on page 333 and *Appendix G: Spreadsheet functions reference* on page 341 for a full description of the Times functions that you can use with the Time and Date formats.

Setting spreadsheet defaults

You can change the way a blank spreadsheet looks when you create it, by setting the defaults below.

- The text settings (font, size, colour and so on) used by the whole spreadsheet, including row and column labels (default is 12pt Trinity Medium).
- The number and size of rows and columns



These are the default settings

- The background cell colour (default is white) but **not** border settings
- The number format (default is general format – this uses as many decimal places as are necessary)
- The cell alignment (default is left aligned)
- The grid and label settings (on by default)
- The empty cell values (default is zero)
- The angle mode (default is degrees) – this defines whether trigonometrical values are dealt with in radians or degrees – see *Angle mode* on page 192.

Warning: Before you change any defaults, save a copy of the standard default document somewhere, so you can return to it if you want.

This is how to change the spreadsheet default settings:

1 Open a blank spreadsheet.

2 Select cell A1 and apply all the settings you want to be used as defaults.

3 Choose the **Utilities/Save as default** option.

The settings in cell A1 are used as the new default settings (although the cell dimensions are taken from the last dimensions specified in the **Alter size...** dialogue box).

From now on, every time you create a spreadsheet, it will open automatically with the new default settings.

Note: If you want to change the units that row and column sizes are measured in, choose **Choices...** from the icon bar menu and change the Page units in the Choices dialogue box.

Getting data in and out of a spreadsheet (importing and exporting)

CSV and TSV files

Often, you'll have some data that you want to incorporate in an Advance Spreadsheet. This can be

- part of an Advance Database or Advance Word Processor file
- data from another spreadsheet package
- a simple text file (experimental results, say, or a league table).

This is easy to do, as long the data is in a form that the spreadsheet can understand. In fact, there are four types of file you can import directly into an Advance Spreadsheet:

- **CSV** (Comma Separated Value) is the standard spreadsheet format used for importing and exporting data files to and from Advance Spreadsheet. As well as Advance Spreadsheet, Advance Database and Advance Word Processor, it is recognised by Lotus 1-2-3, Microsoft Excel and other spreadsheet programs.

- **TSV** (Tab Separated Value) is another standard format used for importing and exporting data files to and from spreadsheets, word processors and databases.
- **WK1** (Lotus 1-2-3 file format).
- **Sheet** (Schema1 file format).

Importing CSV and TSV files

To import a CSV or TSV file into an open spreadsheet file:

1 Select a cell in an open spreadsheet. This cell will be at the top lefthand corner of the data when you import it.

2 Drag the CSV or TSV file's icon over the spreadsheet window.

You can also import WK1 and Sheet files in the above way.

Note: If you import a CSV or TSV file into a new, blank spreadsheet, the Spreadsheet will change size to fit the data exactly. If you import into a spreadsheet file that already has data in it, you need to make sure that there are enough blank rows and columns to take the imported file, otherwise your data may get truncated.

Saving (exporting) data from a spreadsheet to a CSV or TSV file

To save a spreadsheet in CSV format:

1 Use the **File/Save as/CSV** option to display the **Save as** box.

2 Fill in a name (or use the default name of CSV).

3 Drag the CSV icon from the **Save as** box to a directory display.

The same principle applies to TSV files. TSV format can be exported to Advance Word Processor and Database. CSV can be exported to Advance Database. See *Appendix A: Moving data between Advance tools* on page 299 for more information.

Remember: CSV and TSV format only save data values, not formulæ or formatting.

Writing CSV files

If you want to create a data file from scratch (i.e. in a plain text editor, not a spreadsheet or database) you need to know how to write a CSV or TSV file.

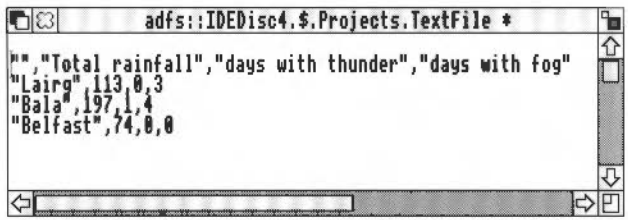
Here's a quick example. Say you have some raw data, written on a piece of paper, that looks like this:

	Total rainfall	days with thunder	days with fog
Lairg	113	0	3
Bala	197	1	4
Belfast	74	0	0

To create a CSV file of this data:

1 Create a blank Text file (using Edit, for example).

2 Type in the data, so that the text file looks like this:



Note:

- Items on a line are separated by commas.
- Text is enclosed in quotes.
- Each line is terminated by pressing Return.
- Blank cells are formed by commas with no text between them (see the lefthand end of the first line in the text file).

3 Save the text file to a directory display.

4 Click Menu over the file's icon to display the Filer menu.

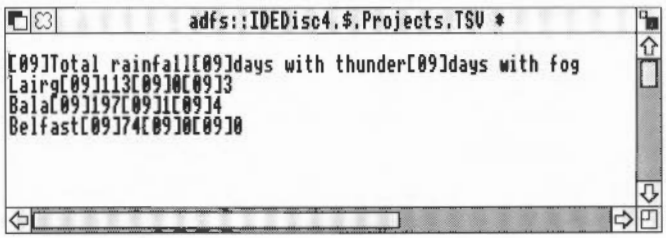
5 Move to the **File/Set type** option and change the file type to CSV.

You're now ready to import the CSV file to a spreadsheet file (see *Importing CSV and TSV files* on page 183).

A good idea if you get confused about how to create a CSV file is to work backwards: create a fairly simple spreadsheet, save it as a CSV file, then drag that CSV file into Edit (or print it out) – you can then see what a CSV file should look like!

Writing TSV files

To write a TSV file, use the same technique as for CSV files, but note that items are separated by Tab characters (ASCII character |09|) instead of commas, and you need to miss out any quotes. Here's what the little weather file on the previous page looks like as a TSV file:



It's very easy to write a TSV file using Advance Word Processor. TSV files have the file type Text, so you don't need to change it using **Set type**.

Saving spreadsheet data in other formats

The following options in the **Save as** menu let you save your spreadsheet in several different output formats. However you should also always save your spreadsheet as a spreadsheet file on disc, so you've got a copy to work from.

Remember: Use a different filename for the export file to avoid accidentally overwriting the spreadsheet file.

You can export part of your spreadsheet by clicking on the **Selection** box of any **Save as:** dialogue box.

Saving data in Graph file format

This is extremely useful if you have a machine with only 1MB of memory. In such cases, you won't be able to load both the Spreadsheet and the Graph tools at the same time, so you need another way to draw graphs:

1. From your spreadsheet file, choose either **Utilities/Graph type/Plot rows** or **Plot columns**.
2. Select the block you want to use as your graph data (if it's the whole sheet, you don't need to do anything).
3. Use the **File/Save as/Graph** option to save your selection as Graphdata to a directory (change the default name if you want).

4 Save and quit this and any other spreadsheets.

5 Quit the Advance Spreadsheet tool (choose the **Minimise memory** option from the Advance icon bar menu).

6 Double-click on the Graphdata file and (assuming the computer has already seen the !AdvanceGR application in a directory display) a graph window will be displayed.

7 Draw the graph in the normal way (choose the X axis label, the Y data, the graph type, then click on **Draw** – see *Displaying results as a graph* on page 114 and *More on graphs* on page 189 for more information).

Saving data in Draw file format

You can use Draw files (saved in DrawFile format) to move spreadsheet data to any RISC OS application that imports Draw files, including Advance Word Processor.

Import spreadsheets into Draw with the **File/Save as/Draw** option and use the drawing facilities to give your spreadsheet printouts a professional presentation.

Saving data as formulæ

When designing spreadsheets it is very useful to have a reference to the logic contained in the spreadsheet. This option lets you save the formulæ you have in your spreadsheet as a text file. You can view the result or print it out. Often, viewing the logic makes it easy to spot a mistake. Here's an example of a spreadsheet saved as Formulæ:

```
A5    :    Brass
A6    :    Guitar
A7    :    Keyboard
...
H5    :    =Average(B5><C5)
```

To save your spreadsheet's formulæ use the **File/Save as/Formulæ** option.

Saving data as a Text file

You can use Text files to move spreadsheet data to other RISC OS applications. This option saves the **values** of the spreadsheet cells. Row and column labels are included in the file. Printing this file produces the same output as is produced by the Draft print option on the Print dialogue box (see *More on printing* on page 187).

To save your spreadsheet as a text file use the **File/Save as/Text** option.

Saving part of a spreadsheet

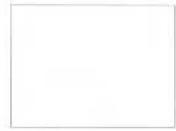
You can save a selected part of a spreadsheet in any of the formats mentioned in the previous section. To save part of your spreadsheet:

1. Highlight the part of the spreadsheet you wish to save.
2. From the **File/Save** option display a **Save as** box.
3. Click on the **Selection** button.
4. Type in a name and drag the icon to a directory window.

More on printing

From the Print dialogue box you can choose how many copies you want to print, and at what scale you want them printed. You can print your copies out portrait (**Upright**) or landscape (**Sideways**).

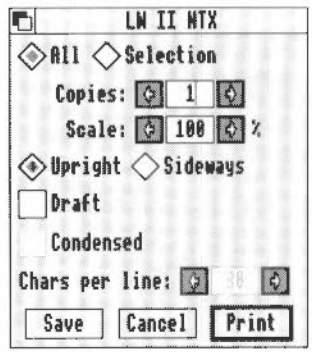
Portrait



Landscape

If you want to print out quickly, click on the **Draft** box. This prints your spreadsheet out as a text file (with no formatting).

If you click on the **Condensed** box, Advance Spreadsheet will attempt to fit as many characters on a line as possible (you can only do this with the Draft box selected).



Saving Print options

When you click on **Print**, your spreadsheet is printed and all the options you have set are remembered next time you print the same file. If you just want to save the options without actually printing, click on the **Save** box.

Seeing the page layout

If you click on **Save** in the Print dialogue box, the spreadsheet will display black lines showing which part of the spreadsheet will fit onto the current paper size defined by !Printers (it will save all the print options too).

Try clicking on **Upright** and **Save**, then **Sideways** and **Save**. You'll see the black lines in the spreadsheet change position.

Other ways of printing

You can print spreadsheets simply by pressing the Print key and clicking on **Print** when the dialogue box is displayed. The type of output generated depends on the print parameters that are currently in force. For example, if the last printout used landscape print, then pressing the Print key will produce a printout with these same characteristics.

You can also print spreadsheets in the standard RISC OS manner, by dragging a **Save as** box or a file icon onto the printer driver icon. From the **Save as** menu you can print your spreadsheet (or a selection) in most of the formats mentioned in *Getting data in and out of a spreadsheet (importing and exporting)* on page 183:

- **Spreadsheet** – prints as an Image print (looks exactly the same as the spreadsheet window on the screen).
- **CSV** – prints as a comma-separated variable text file
- **TSV** – prints as a tab-separated variable text file
- **Draw** – prints as a DrawFile
- **Formulæ** – prints a long list showing each cell's contents.

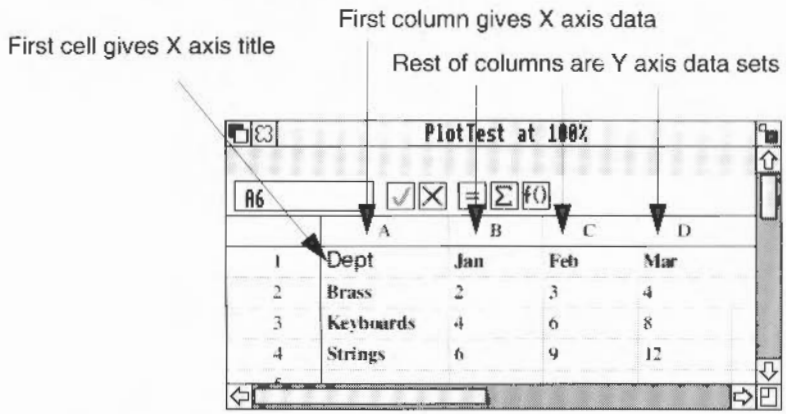
  If a cell contains a formula, then the formula itself is printed, rather than the result.
- **Text** – prints as a text print (this is equivalent to the **Draft** option in the Print dialogue box).

More on graphs

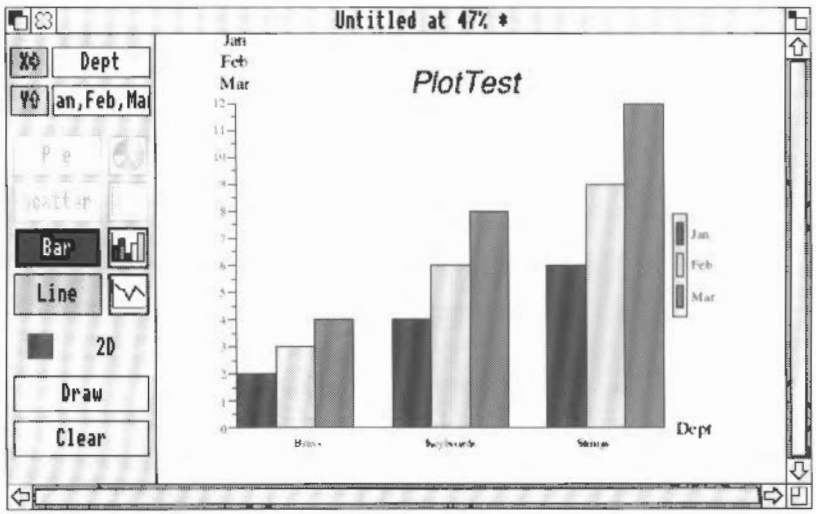
There's more information on the Graph tool itself in the chapter entitled *The Graph tool* on page 273. This section explains in a bit more detail how to plot graphs from a spreadsheet.

Plotting column data

The Graph tool always expects data to be supplied to it in column format, and this is the default way in which the spreadsheet sends data to the Graph tool. Consider this simple example spreadsheet:

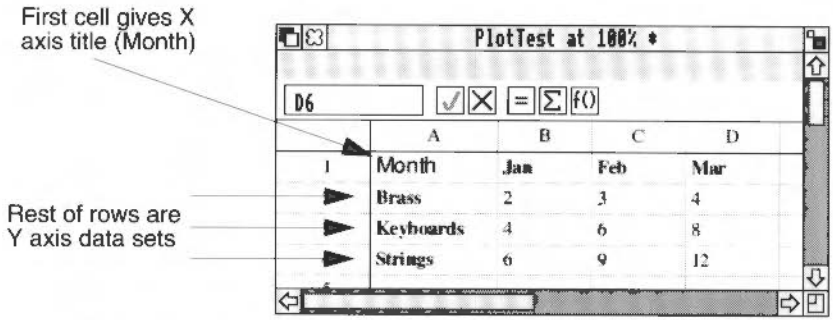


Choosing **Utilities/Graph type/Plot columns** will produce the following graph, showing departmental figures for each month:

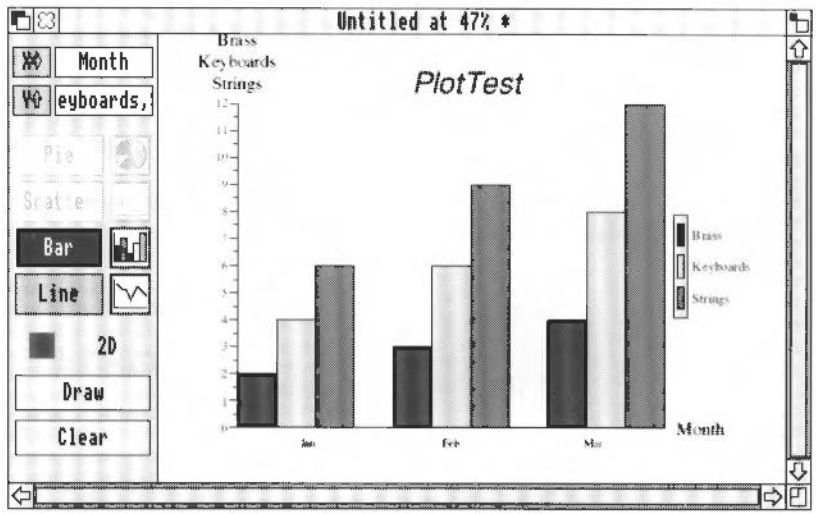


Plotting row data

Suppose you want instead to have a graph the shows the monthly figures for each department (i.e. you want the **rows** in the spreadsheet to be the datasets, instead of the columns). You need to change the X axis title to Month:



Choosing **Utilities/Graph type/Plot rows** will produce the following graph:



A couple of points to remember when plotting graphs from the Spreadsheet:

- You don't **have** to choose the first row/column in the selection as the X axis data.
- If the X axis title cell is blank, the Graph tool will supply the title `Records`.
- If a dataset has no heading, the Graph tool will give it a name of the form `Fieldx`, where x is the number of the row or column in the spreadsheet.

Plotting numeric data on X and Y axes

The previous example showed numeric data plotted on one axis only (the Y axis). You can easily use Advance Spreadsheet to plot numeric data on both axes with the Graph tool. This allows you to plot mathematical functions really easily.

Here's a quick example, showing how to plot a graph of the function $y=x^2+2$ over the range of x values −10 to +10:

1 Create a blank spreadsheet, with 22 columns and 2 rows.

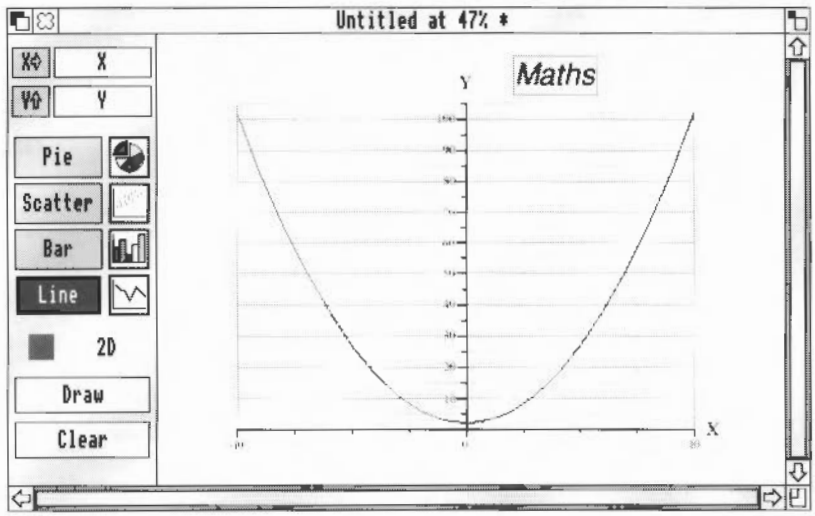
2 Enter the following data and formulæ:

Cell or block	Enter this
A1	X
A2	Y
B1	−10
C1><V1	=B1+1
B2><V2	=B1^2 +2

3 Choose **Utilities/Graph type/Plot rows**.

4 Select the whole spreadsheet.

5 Press F7, choose X as the X axis, Y as the Y axis, and plot a line graph with a grid:



Angle mode

Jim hasn't really got any call for doing trigonometrical calculations. If **you** need to, there is a facility which allows you to treat angles as being expressed in degrees or radians. This affects the scientific and trigonometrical functions in the Entry menu.

To do this, use the **Utilities/Angle mode** option. This sets the angle mode for the whole spreadsheet (not just selected cells).

Summing up

That's the end of Jim's work with Advance Spreadsheet. If you've followed his progress through this chapter, and the previous chapter, you should be quite confident about using Advance Spreadsheet. If you've read all of this chapter, you'll know more than Jim does! In this chapter, you've learnt how to

- change the appearance of a spreadsheet using effects
- sort Spreadsheet data and define key rows or columns
- copy and move data around a spreadsheet whilst maintaining the logic of all the formulæ
- write conditional expressions using complicated formulæ and functions
- create and update references to other Advance Spreadsheet documents
- import and export data in different file formats
- plot more complicated graphs.

The next chapter introduces you to Advance Database. In it, and the following two chapters, you'll meet Jane McCluskey, Music Matters' manager, and follow her progress as she gets to grips with the Database.

After that, you'll find more information about Advance Spreadsheet in three of the appendices: *Appendix E: Using expressions in Advance Spreadsheet* on page 323, *Appendix F: Using Advance Spreadsheet functions* on page 333 and *Appendix G: Spreadsheet functions reference* on page 341.

9 Introducing the Database

Advance Database can be used to create a database which you can sort and search in various ways, use to produce graphs and tables, or produce files that can be used by Advance Word Processor and Advance Spreadsheet.

What is a database?

A database is simply a store of information which is usually held on a computer. One very large database that can be found in almost every home is a telephone directory. This is a database where each entry contains three pieces of information: a name, an address, and a telephone number. These entries are sorted into alphabetical order using the surname. This means that if you want to look up the telephone number of John Smith, then you first go to Smith, and then to John Smith (if there are several John Smiths you would also have to check the address). But what if all you could remember was the first name, John, and his address? You would have to look through the entire telephone directory trying to find the address! If all the information in a telephone directory was kept in a database on a computer, you could search for a name **or** an address. Being able to search through large amounts of data for specific information is just one of the advantages of using databases on computers.

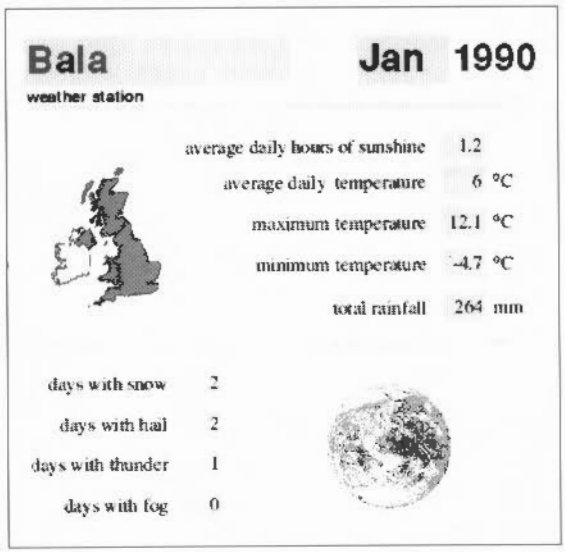
Advantages of a database on a computer

- It can store immense amounts of information.
- You can search through this information for specific data.
- You can sort information into any order you wish.
- If the information includes numbers (e.g. sales figures) you can produce graphs from it.
- You can extract and print out any useful subsets of information.

Some examples

The following two database records were created using Advance Database. You can think of a database *record* as a card that records all the information you need about one specific object, or event, or person. In the top example, one record stores all

the details about a particular musical instrument sold by the Music Matters shop. If the shop had one of these records for every musical instrument it sold, then the complete collection of records would form a database.



10 Getting started with the Database

This chapter is an introduction to Advance Database. When you have finished it you will have learnt enough to create your own Advance database.

This chapter takes you through the creation of a database for our musical instrument shop, Music Matters. Jane McCluskey, the manager of Music Matters, designs and creates a database, and then enters data about the instruments the shop sells into this database.

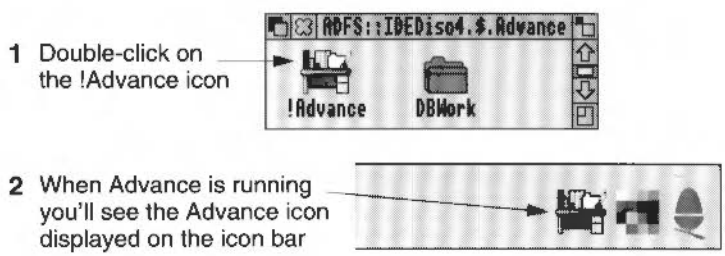
Jane McCluskey has been eagerly awaiting her copy of Advance. For some time she has been dissatisfied with keeping information about Music Matters on cards that have to be re-typed every time any data needs changing. She sees a computer database as an ideal way to store all that information much more efficiently. And as a bonus she can use the database to sort her data, search for useful information, and even produce graphs and reports.

The best way to learn about Advance Database yourself is to duplicate everything Jane does on your own computer. This way you will learn how to build a database step by step. If you don't want to do this, but still want to look at the database Jane creates, then you will find her database, and all her files, on Data disc A.

Creating a new database

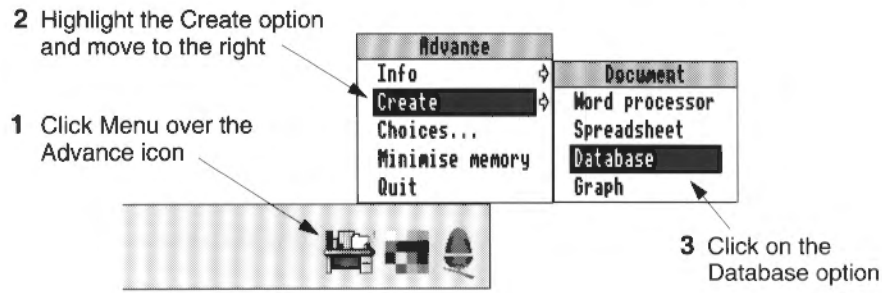
Loading Advance

To start using Advance Jane, displays the directory containing the !Advance icon on the screen and then double-clicks on the Advance icon. This loads Advance onto the icon bar ready for use.

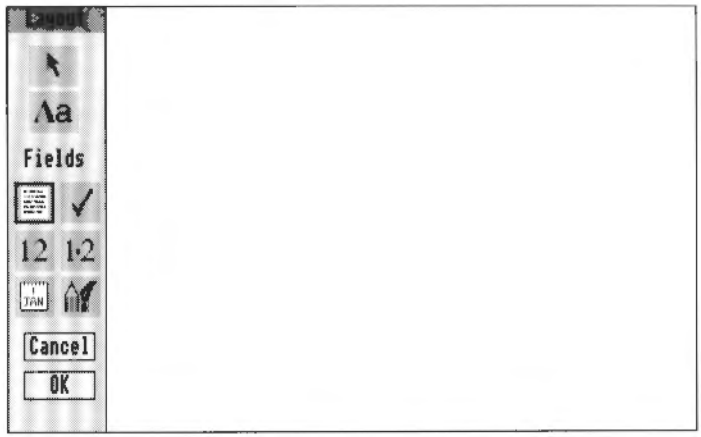


Creating a blank database

Jane presses Menu (the middle mouse button) over Advance's icon on the icon bar and chooses the **Create/Database** option.



A blank Layout Editor window appears:

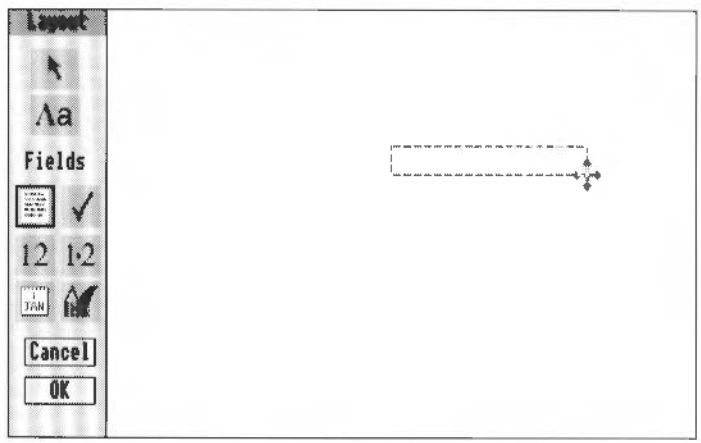


Before Jane can use this window to design her database, she'll need to know a few things about Advance Database.

Starting out

Here is some basic information that will help Jane get started. She'll actually start work on her database in *Creating a layout* on page 200.

Jane moves the pointer into the Layout Editor window. Four dashed lines appear and the pointer changes shape:



The pointer indicates that Jane is in Field mode, and can now create a **field**; the dashed lines specify the position and size of a field. Fields and their properties are described in *Fields* on page 198, creating and positioning fields is described in *Creating a layout* on page 200. Before Jane creates any fields you should first familiarise yourself with the Layout toolbox.

The Layout toolbox

The Layout toolbox is to the left side of the window. There are three modes available:

Select mode

In this mode you can select any text, fields or pictures and then either move them elsewhere in the layout window, or use the Layout menu (described later) to change their appearance (e.g. you could change the size and colour of text).

Text mode

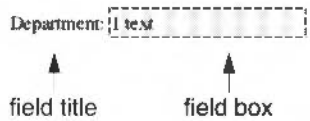
In this mode you can insert new text anywhere in the layout window, or change text that is already in the window.

Field mode

In this mode you can insert fields anywhere in the layout window.

Fields

Fields are the areas on a record where you enter information. Each field comprises two parts, a field title and a field box.

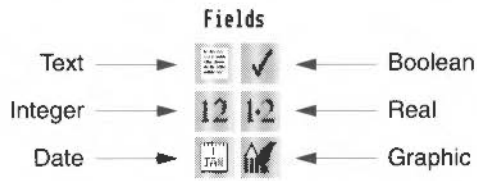


The field title is a piece of text that acts as the name of the field, and the field box is an area where you can enter data. So, in the following example, `Department :` is the title of the field, and the field box is the rectangle with `1 text` inside it.

As the field title can be moved without moving the field box, whenever the word 'field' by itself is mentioned it refers to the field box **and** the field title. For example, the phrase, 'move the pointer to the left of Field `1`', would mean move the pointer to the left of both the field title and the field box. In the above example therefore, you would move the pointer to the left of the word `Department`.

Types of field

You can specify the **data type** for each field you create using the following buttons:



Data types determine what sort of data you are allowed to type into a field box. The six data types you can specify are:

Text – allows you to enter text.

Integer – allows you to enter only a whole number, for example 34.

Date – allows you to enter a date.

Boolean – allows you to enter a yes or no value.

Real – allows you to specify a number with a decimal point, for example 34.5. However, numbers with trailing zeroes, e.g. 34.00, are displayed as integers, e.g. 34

Graphic – allows you to drag a Draw file or Sprite file to the field.

For a full description of data types see *Data types* on page 263.

Designing a database

Jane needs to decide what information she wants to store in her database. An Advance database is made up of a series of **records**. One record can contain up to a page of information. Once Jane's decided what data she wants to appear in each record, she can begin to design the layout of her database.

This is like designing a form for people to fill in. Jane will use the Layout Editor to create a template that will be used by all the records in her database.

As Music Matters sells musical instruments, Jane decides that each record in her database will be devoted to one particular instrument. The information about each instrument that she thinks will be essential to store is

- which department the instrument is sold in
- what the instrument is
- the exact model of the instrument
- how many have been sold this year
- how many are left in stock
- how much they sell the instrument for (the retail price)
- how much they buy the instrument for (the wholesale price)
- the name and address of the supplier
- how long it takes to deliver the instrument once it is ordered from the supplier.

On a piece of paper Jane now draws a rough plan of the way she wants each record to be laid out:

It will be useful to have this drawing handy when she starts to lay out her database in the next section (it will make it easier to visualise what she's doing).

Creating a layout

Jane has now identified the information she needs to know about each instrument in the music shop. Each piece of information will require its own field. Some fields will contain text, some will contain numbers, and others will contain pictures. To help her line up these fields accurately when she creates them, Jane decides to superimpose a rectangular grid on the Layout window.

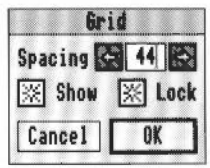
Using the Grid option to help position fields

When Jane first moved her pointer over the Layout window she was immediately put into Field mode, but before she creates any fields she wants to display a grid on the Layout page.

1 She goes into the **Utilities/Grid** dialogue box.

2 By default the grid is not displayed and the lock is set to off. To display the grid on the Layout window she

- clicks on **Show**
- clicks on **Lock**
- sets the spacing to 44. This spacing is ideal for 12 point text.
  The box now looks like this:



- finally, she clicks on **OK**. The grid is now displayed on the Layout window.

Note: As a short-cut, pressing F10 will toggle the grid off and on.

Creating database fields

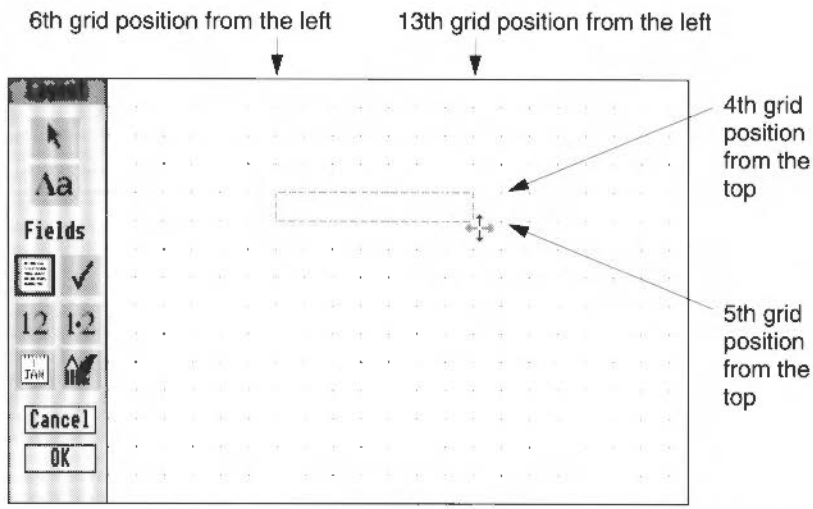
Creating the first field

Jane already knows how she wants to position her fields, and she has decided that the first field will contain the name of the department:

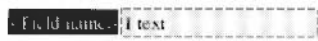
1 She begins by clicking the **Text field** button in the toolbox and then moves back into the Layout window. She can now create a text field (in fact, when Jane first entered the Layout editor she was already in this particular mode by default).

As soon as the pointer moves inside the window it changes shape into four arrows. The pointer is attached to a rectangle which defines the default width of the field box (7 grid units wide by one grid unit deep).

2 She moves the pointer so that the right side of the rectangle is over the thirteenth grid position from the left, and the bottom of the rectangle is over the fifth grid position from the top:



3 She then clicks Select. The pointer disappears and `<Field name>` appears to the left of the rectangle.



This is a default title for this field, and to remove it Jane types the word `Department:` (don't forget to include the colon at the end of the word). As soon as Jane begins to type the default title disappears:

`1 text` also appears inside the field box. The `1` means that this field is Field number 1. Each time a field is created it is given a number one higher than the last field. These field numbers do not appear on the records in the database, but they do determine the order in which you enter data into records in the database.

The word `text` signifies that this is a text field.

Note: Only field types **Text**, **Integer**, **Real** and **Date** are given field numbers.

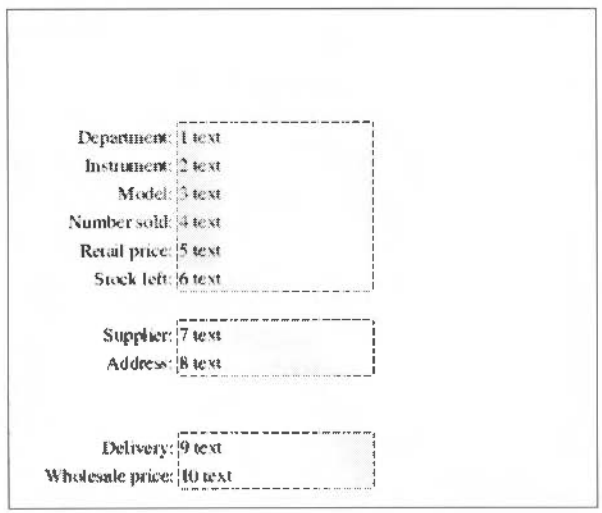
Adding the remaining fields

To create the second field Jane moves the pointer one grid position lower (the thirteenth grid position from the left and the sixth grid position from the top), clicks Select, and gives the field the name `Instrument:`.

Jane now creates the remaining eight fields giving them the following names:

Field 3	`Model:`
Field 4	`Number sold:`
Field 5	`Retail price:`
Field 6	`Stock left:`
Field 7	`Supplier:`
Field 8	`Address:`
Field 9	`Delivery:`
Field 10	`Wholesale price:`

When she finishes, the layout page looks like this:



Changing the data type

Now that Jane has created all her fields she wants to change some of them from being text fields to fields of a different data type.

1 She begins by clicking the Select mode icon in the toolbox.

2 Field boxes 4, 6 and 9 must hold integer numbers, so she highlights them (using Adjust to add or remove a field box) and then clicks Select on the **Integer** button.

3 Field boxes 5 and 10 must display the retail and wholesale prices, so she highlights them and then clicks Select on the **Real** button.

Jane is thankful that all that editing is finished, but when she looks at the layout she notices that instead of naming the second field `Instrument`, she's actually typed in `Insrument`. It's no real problem though, all she does is click the **Text mode** button in the toolbox, move the pointer (which is now a caret) between the 's' and 'r' in `Insrument`, and type in a 't'.

Note: If you create the same fields for yourself, don't worry if you create a field in the wrong place, changing the position of a field is straightforward and is described in the following section.

Changing the size and position of fields

Now that Jane has created her data fields she wants to alter their sizes and positions to make them easier to see and use. She begins by changing the sizes of the field boxes.

Changing the size of a field box

The default length for a field box is 7 grid units (assuming the grid spacing is 44). This length is either too little or too much for most of the field boxes that Jane has made, so she has to change their size:

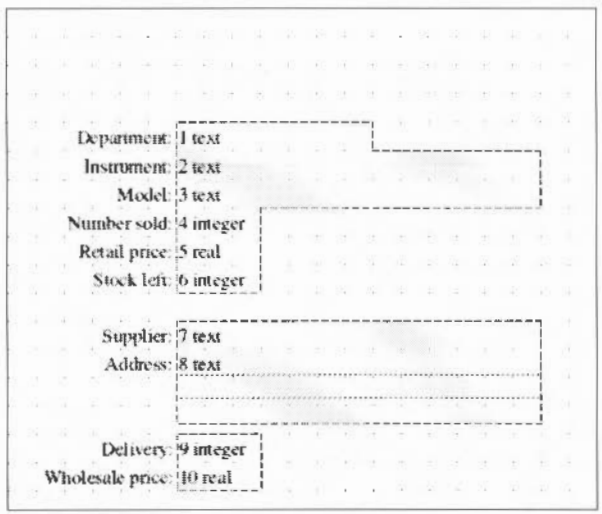
1. She begins by clicking **Select mode** in the toolbox.
2. Next she moves the pointer to the Instrument field (Field 2). When the pointer is over the field box it changes shape to a hand. She then clicks Select. The field box is highlighted and a small handle appears at the bottom righthand corner:

3. She now moves the pointer over the handle (the pointer changes again, this time to a cross). She presses Select and drags the mouse until the field box is 13 grid units long (i.e. to the 19th grid position).

Jane now changes the size of the other field boxes:

4. Field boxes 3, 7 and 8 are all **Text** fields that may have to accept several words (e.g. the name of a street), so she highlights them all using Adjust, and then drags the handle on one of them until all three fields are 13 grid units long.
5. Field boxes 4, 5, 6, 9 and 10 are **Integer** or **Real** fields, and as they will never need to accept very large numbers (unless Music Matters becomes world famous) they can be much shorter, so she decreases them to 3 grid units long.
6. Finally, field box 8 is going to contain the address of the supplier, so it must be able to accept three lines of text. Jane increases the **depth** of the field so that it is 3 lines deep.

Note: If there are several field boxes that need shortening or lengthening by the same amount, you can select them all (by clicking Adjust on each one) and then drag any of the displayed handles to the required length. All the highlighted field boxes will be resized. Jane's layout page now looks like this:



Changing the position of a field

Now that the field boxes are the correct size Jane wants to re-position them. She begins by moving field 6:

1 She clicks **Select mode** in the toolbox.

2 Next she moves the pointer over field box 6. She presses Select and, keeping Select pressed down, she drags the field to the right, so that its righthand edge aligns with the righthand edges of fields 2 and 3. The field name is also dragged.

Having moved this field, Jane moves several other fields

3 She drags field 5 down one grid position.

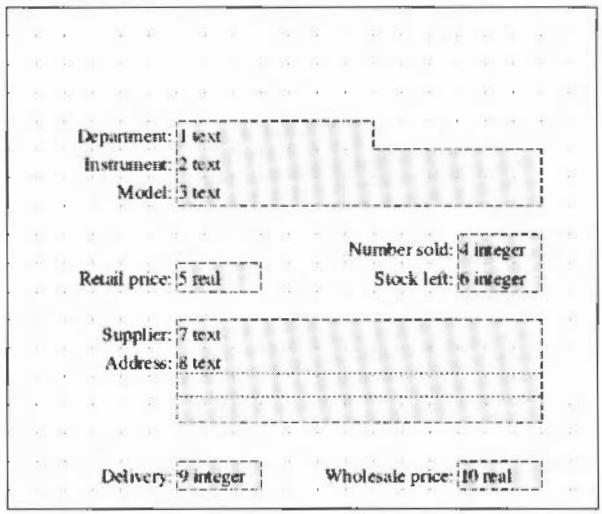
4 She drags field 4 to the right, so that its righthand edge aligns with the righthand edge of field 6, and then she drags it one grid position lower.

5 She drags field 10 so that its righthand edge aligns with the righthand edge of field 6.

6 Finally she drags field 9 down one grid position.

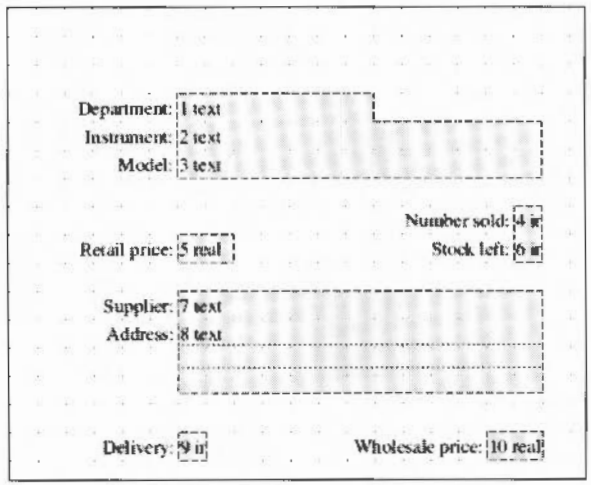
Note: If you drag a field, make sure that you move the pointer over the field box before clicking Select to drag it. If you click Select over the field title and drag, you will only move the field title.

Jane's layout page now looks like this:



Jane decides to reduce further the size of fields that will contain numbers, so she reduces the Retail price and Wholesale price fields to two grid units, and the Number sold, Stock left and Delivery fields to one grid unit.

The Number sold, Stock left and Wholesale price fields are no longer aligned with the other fields correctly, so she drags these three fields so that they once more line up with the Model field. Her layout now looks like this:



Note: When Jane shortens a field so that the text specifying the data type of that field cannot fit inside the field box, the text is clipped. So, for instance, `9 in` appears inside the Delivery field instead of `9 integer`.

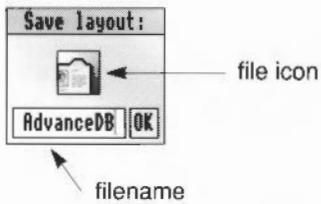
Saving a database layout

After creating all her fields Jane thinks it's about time she went out for a bite of lunch, but before leaving she saves her work.

1 She begins by inserting a work disc into her floppy disc drive and creating a new directory called `DBWork`. She then opens this directory.

OK

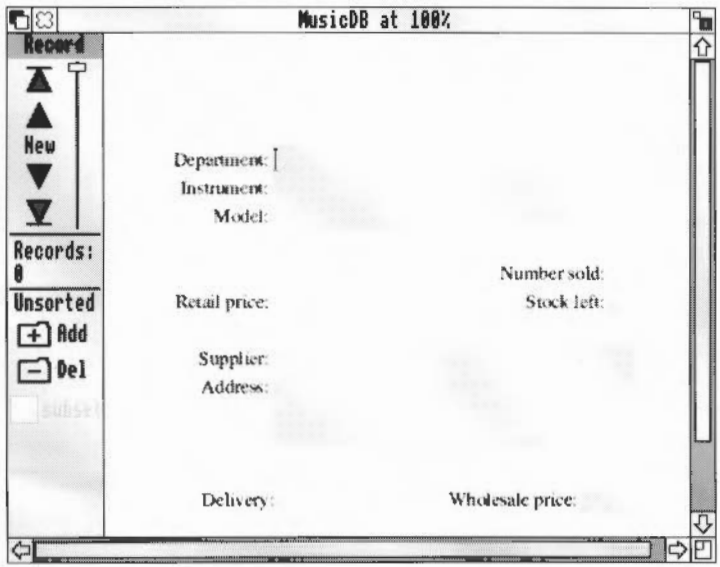
2 Leaving the directory displayed on her screen, she returns to the Layout window and clicks on the **OK** button in the toolbox. The Save layout box is displayed:



This dialogue box contains an icon, an **OK** button and a box into which Jane can type the name she wants to give her file.

3 She deletes the default name, `AdvanceDB`, and types in a more appropriate filename, `MusicDB`. She then clicks Select on the file icon and drags it to her new directory.

After she has dragged the file icon to her new directory, the Layout window closes and the One Record window is displayed:



In fact this is the main editing window for her new database, and every time she opens her database file it is **this** window which is opened. It is known as the One Record window, but as Jane is not yet ready to start entering data she clicks on the close icon in the top left corner of this window. She now goes off to lunch.

Returning to the Layout editor

After lunch Jane returns to finish off her layout and start entering some data. The first thing she does is to double-click on her new file `MusicDB`. However, instead of seeing a window containing her unfinished layout, she sees the One Record window. As Jane is not yet ready to start entering data she returns to the Layout window by clicking Menu and choosing **Edit/Edit layout**.

The One Record window closes and the Layout window opens where she left off before lunch.

If you are following the layout Jane is creating, but don't have time to duplicate everything she does, a copy of the work she has done so far is contained in the database file `Jane1` in the `DBtutorial` directory on Data disc A. To open this file, just double-click on its icon. You will see the same file that Jane sees when she opens her own file.

Justifying data in a field box

When you type data into a field box it is left-aligned by default, so that the first character you type in appears to the left of the field box. Sometimes data looks better right-aligned; the last character typed in appears to the right of the field box.

Left-aligned Number sold: 12

Right-aligned Number sold: 12

Jane decides to make all the integer and real fields (Number sold, Retail price, Stock left, Delivery and Wholesale price) right-aligned:

1. She goes into Select mode and then highlights all the fields to change.
2. She then chooses **Effect/Alignment/Right align**.

The numbers in the changed fields are re-displayed to the right of the fields to signify that these fields are right-aligned.

Adding and changing text

Adding text

Having specified all the fields of data she wants, Jane decides to add the word 'days' after the Delivery field box, to remind herself that this delivery period is in days, not weeks:

Aa

1 She goes into Text mode.

2 Then she clicks Select to the right of the Delivery field (but not in it). A caret appears and she types `days`.

Unfortunately the word `days` is not lined up to the Delivery field, so Jane goes back into Select mode, clicks Select on the word `days`, and drags it so that it sits to the immediate right of the delivery box:

Adding a title

Aa

Jane wants to smarten up each record with a title. To do this she goes into Text mode, moves the pointer (now in the shape of a caret) to the sixth grid position from the left and the third grid position from the top (just above field 1), and types in `Music Matters`.

Changing text

If you want to change any text you have added to the Layout, go into Text mode, click Select in the text box you wish to alter, and change the text

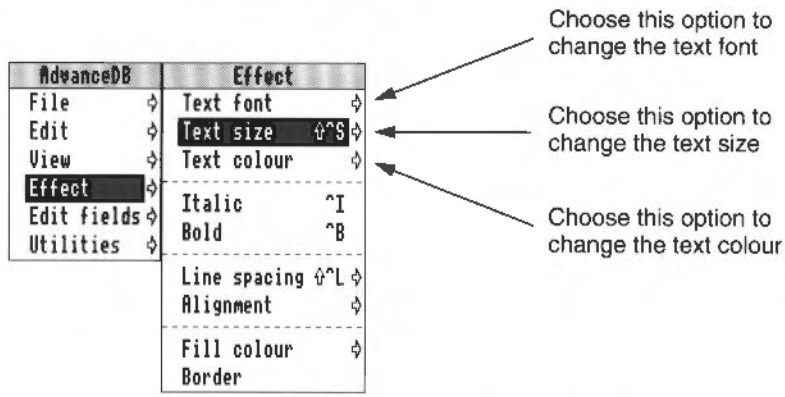
Changing the appearance of text

Changing the size of text

Jane thinks the title should stand out more clearly from the rest of the record, so she decides to increase the text size of the title:

1 She goes into Select mode and highlights the text `Music Matters`.

2 Then she chooses **Effect/Text size/24 pt**.



The highlighted text is now increased in size to the new font size.

After looking at the title for a few moments Jane thinks it still needs 'beefing up' a little, so she decides to make it really stand out by changing the font to bold. As the text 'Music Matters' is still highlighted, she goes back into the Effect menu and clicks on **Bold**. The title is immediately changed. She then moves the title up nearer the top of the layout.

Note: Alternatively, Jane could have chosen **Effect/Text font/Trinity/Bold** (or just typed Ctrl-B).

Changing the field font

Now that Jane has changed the title font she decides to use a different font for the field titles to distinguish them from the font that will be used to enter text and numbers into the fields.

1 The title is still highlighted, so Jane clicks Select over a blank part of the layout. This clears any fields that are highlighted (choosing **Edit/Clear** also deselects any highlighted fields).

2 She's already in Select mode, so she clicks Adjust on all the field titles (making sure that she doesn't accidentally click on any of the actual field boxes). All the field titles are now highlighted.

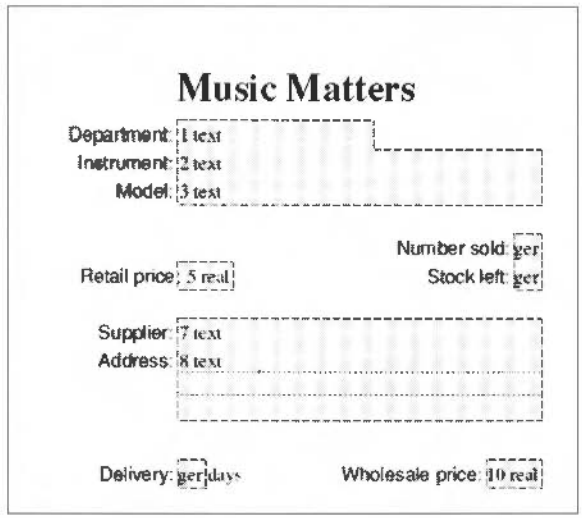
3 Finally she chooses **Effect/Text font/Homerton/Medium**.

All the text in the field titles are changed to the new font.

Note: If Jane wanted to change the font for the field boxes only, she would either highlight all the fields and then click Adjust on all the field titles (so that only the field boxes themselves remained highlighted), or drag a rectangle over just the field boxes. She could then change the font (or font size etc) using the Effect menu.

Removing the Grid

Jane is finished with the Layout editor for now, but she wants to see what her layout looks like without the grid, so she presses F10 to toggle the grid off. Jane's finished layout looks like this:



Quitting the Layout editor and going to the One Record window

OK

Now that Jane has finished her layout, she wants to save it and then go to the One Record window. She clicks on the **OK** button. This saves any edits she has made, closes the Layout window, and opens the One Record window.

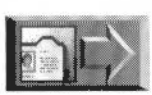
Removing any edits and going to the One Record window

Cancel

If Jane wanted to quit the Layout editor and go to the One Record window **without** saving her edits, she could click on the **Cancel** button. This would display a dialogue box allowing her to return the layout to the state it was in before she began editing, close the Layout window, and open the One Record window.

Quitting the database altogether

If Jane had wanted to quit out of her database file altogether, she would have clicked on the close icon in the top left corner of the Layout window. This would have displayed the same dialogue box as clicking on the **Cancel** button. After choosing whether she wanted to save her edits or not, the database file would have been quitted altogether.



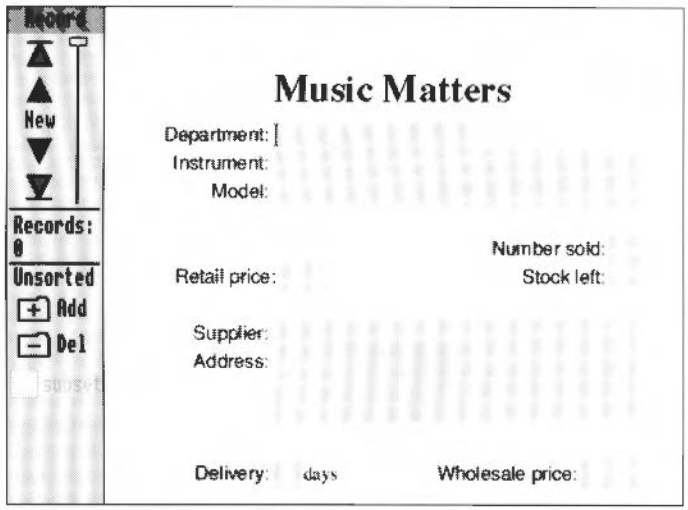
If you want to catch up with where Jane has got to with her layout, look at the file `Jane2` in the `DBtutorial` directory on Data disc A.

Entering data

The One Record window

The Layout window allowed Jane to design and create the template for the records in her database. The One Record window displays a copy of that template where she can start to enter her data.

When Jane first enters the One Record window she sees the following:



To the left side of this window is the Record toolbox which allows her to add or delete records, and move between the records in her database.

The field boxes to the right of the field titles are blank. Jane can now fill the field boxes in each record with her own data. The first record she fills in is for a trumpet:

1 Because Jane has just opened the One Record window, there is a caret already in position at the beginning of field 1 (the Department field). She types in the name of the department, `Brass`, and presses Return. The caret moves into the next field box (the `Instrument` field).

2 She now enters the rest of the information for this record, pressing Return after typing the data into each field:

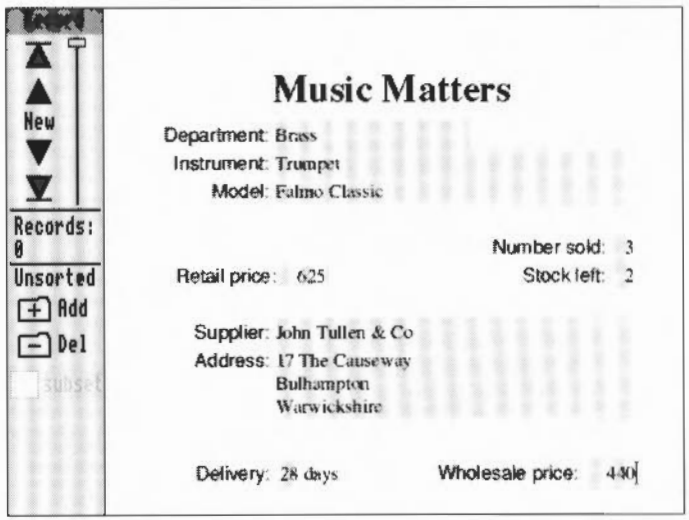
Field	What Jane types in
Instrument	`Trumpet`
Model	`Falmo Classic`
Number sold	`3`
Retail price	`625`
Stock left	`2`
Supplier	`John Tullen & Co`

Address	`17 The Causeway`
	`Bulhampton`
	`Warwickshire`

Delivery	`28`

3 Next she types `440` (the wholesale price) but does **not** press Return

Her first record now looks like this:



4 Finally she presses Return. The dialogue box disappears and a new blank record is displayed ready for entering more data.

Adding a second record

The next record Jane wants to create is for a guitar. She types the following data into this second record, pressing Return after typing the data into each field:

Field	What Jane types in
Department	`Guitar`
Instrument	`Electric Guitar`
Model	`GX`
Number sold	`7`
Retail price	`750`
Stock left	`2`
Supplier	`Gantry Electric Guitars Ltd`
Address	`13 Tavistock Way Wakefield Yorkshire`
Delivery	`14`

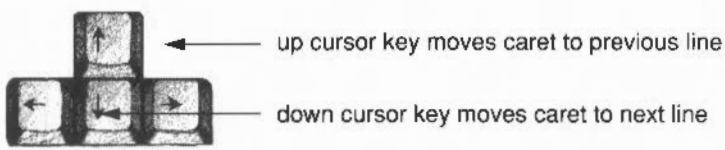
Finally, she types `550` (the wholesale price) but she does **not** press Return: she wants to check the data she has just typed in before moving to the next record.

Moving between fields and editing text

After Jane has entered the last field, she sees that she has typed Tavistick instead of Tavistock in the address field. To correct this she positions the pointer over the mis-spelt word, clicks Select, and corrects the spelling. When she has done this, she clicks on the **Add** button in the Record Toolbox (this button looks like a card with a plus sign on it) and a new blank record is displayed.

Instead of using the pointer to move to a particular field, Jane could use the Tab key or cursor keys.

- The up and down cursor keys move you up and down in the field boxes:



- The Tab key moves the caret from the field box you are on to the beginning of the next field. Shift Tab moves the caret to the end of the previous field.

If the caret is in the last field box of a new record, pressing Tab saves the record and displays a new blank record.

Importing data from a CSV file

Creating a CSV file

There are still 40 more records to fill in and Jane has a lot of other pressing work to do, so she asks one of her assistants to create an ordinary text file on her work disc and type in all the details for the remaining records. After her assistant has finished typing in the data she names the file `MusicData`. Jane then changes the file type of this file from a text file to a CSV file (by highlighting the file, choosing **File/Set type** from the Filer menu, and typing `CSV` into the Set type dialogue box.

CSV file format

When Jane's assistant types the data into the text file she uses CSV format. In this format

- each field in a record is separated by a comma
- the contents of text, boolean and date fields are enclosed in double quotes
- if a text field is split into several lines, as in the supplier's address field, each line of text in that field is separated by a backslash followed by an 'n' (\n).
- the first line in the file usually contains the title of each field.

For example:

```
"Department","Instrument","Model","Number sold","Retail price",
"Stock left","Supplier","Address","Delivery","Wholesale price"
"Brass","Cornet","John Padinger Triumph",9,900,3,
"Arnold Templeton","The Hythes\nTrowbridge\nSussex",14,675
```

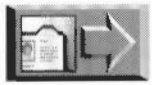
Note: The CSV file called `MusicData` (typed in by Jane's assistant) has been included in the `DBtutorial` directory on Data disc A.

Importing a CSV file

When she is free again, Jane **imports** the data from the CSV file into her database file. Importing is the phrase used for copying data from another file into a database that you are currently editing.

1. She drags the file called `MusicData` from her work disc to the toolbox in the One Record window and releases the Select button.
2. A window now appears with the title `Map fields`. At the top right of this window is a button marked **Merge**. After a quick check of this mapping window, she clicks on **Merge**.

Although the data from the file now fills up the next 40 records, bringing the total number of records to 42, there is no visible change to the One Record window. It is only when Jane uses the toolbox to move around all her new records that she sees the imported records.



If you want to catch up with where Jane has got to with her database, look at the file `Jane3` in the `DBtutorial` directory on Data disc A.

For more information on importing data from CSV and other files, see *Importing data from other files* on page 253. For information about creating CSV files from an Advance database, see *Saving CSV and TSV files* on page 260.

The Record toolbox

When Jane wants to add new records, delete old ones, or just examine specific records she uses the Record toolbox. This toolbox allows you to

- move between records
- add new records
- delete records.

It also displays how many records there are in the database (underneath the word 'Records'), and shows the number of the record you are currently working on (in the middle of the four move buttons).

The **subset** button is described in *Searching* on page 230.

Moving between records

There are four ways to move between records in your database:

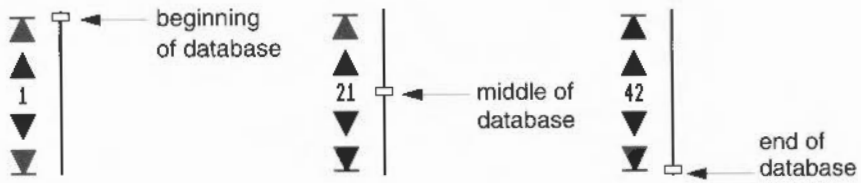
Using buttons

The buttons at the top of the toolbox are used to move around the records:

- The **First Record** button takes you to the first record.
- The **Previous Record** button takes you to the previous record.
- The **Next Record** button takes you to the next record.
- The **Last Record** button takes you to the last record.

Using the drag bar

You will see a drag bar to the right of the four buttons. The small rectangle shows you whereabouts you are in the database.



To use the drag bar to move between records, you can

- point to somewhere on the bar and click Select
- drag the small rectangle up or down the bar.

Try it and see what happens.

Using the record number

If you want to move directly to any specific record, and you know the number of the record, you can:

1. click Select on the record number (in the middle of the four move buttons). A caret will appear to the right of the record number
2. press Delete to remove the record number already there
3. type in the number of the record you want to see
4. press Return.

Using Go to record

Go into the **Utilities/Go to record** dialogue box and type the number of the record you wish to go to.

Note: A special editing window is available which allows you to scroll through the records in a database. This window is described in *The All records window* on page 267.

Deleting a record

To delete a record, move to it (so it is displayed in the window) and then click on the **Del** button (the button with a minus sign on it) in the toolbox.

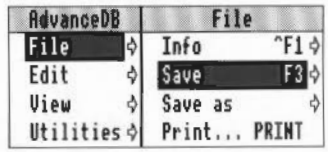
Saving your data

Advance Database automatically saves every record you type in or import, so there is no need to save your database. The only time a record is not automatically saved is when you go to a particular record and change it in some way. If you do this, Advance Database will prompt you to save that record.

Saving data into a new file

Normally you do not have to bother saving your work because Advance Database saves it for you, but if you want to save your database into a new file (for example, as a backup or experimental copy) do the following:

1 Choose the **File/Save** option:



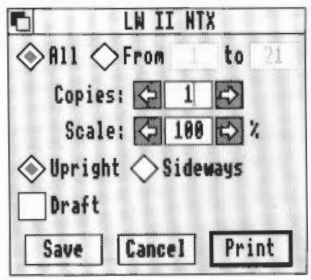
2 **Save** leads to a **Save data** box allowing you to save the database into either the file you created when you first quitted the Layout Editor (as described in *Saving a database layout* on page 206), or into a new file of your own choosing.

For a description of the **Save as** options, see *Saving data in different formats* on page 268.

Printing a record

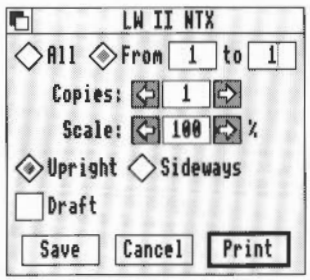
Now that Jane has finished entering data into the Music Matters database, she decides that she wants to print one of the records. Before she tries this she makes sure that she has a suitable printer correctly connected and set up, and that the !Printers application is loaded onto the icon bar.

She presses the Print button on the keyboard to display the Print dialogue box:



She then does the following:

- clicks on **From** and replaces 21 in the **to** box by 1
- clicks on **Print** to print her record.



For a full description of **Print**, see *Printing* on page 268.

Quitting the database

Jane decides that she has done enough work on her database and quits it by clicking on the close icon in the top left corner of the One Record window.

Quitting Advance altogether

As she doesn't intend working any more today at all, Jane decides to quit Advance altogether, so she presses Menu on the Advance icon on the icon bar and then clicks Select on the **Quit** option.

Summing up

In this chapter you've been introduced to the basic features of Advance Database. You've learnt about creating a layout, entering data and moving around records.

The following chapter, *Learning more about the Database*, describes the more sophisticated features of Advance Database. In this chapter, Jane adds pictures and colour to her database, and then sorts her records into a more useful order. She goes on to create some graphs from the data in her database, and finally she produces a sales report.

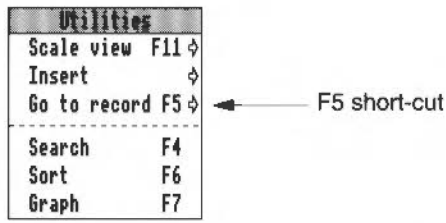
11 Learning more about the Database

This chapter describes how to use the more sophisticated features of Advance Database. You'll learn how to include pictures, change the colour of text and fields, sort records into a more useful order and search for information. You'll also learn how to create a graph and produce a report.

After installing Advance on the icon bar, Jane double-clicks on her new file `MusicDB`. When the One Record window opens she returns to the Layout window by choosing **Edit/Edit layout**.

Using menu short-cuts

Jane has noticed that when she displays a menu, there are often symbols (such as ^) and characters (such as F5) next to some of the menu options. For example, F5 appears next to the Go to record option.



These letters and symbols are keyboard short-cuts, which save using a particular menu option:

- The 'hat' shape ^ represents Ctrl. Press and hold down Ctrl, then press the appropriate key to make the selection.
- The ⇑ represents Shift. Press and hold down Shift and then press the appropriate key to make the selection.
- The symbols F1 to F12 denote the function key along the top of the keyboard. Press the appropriate function key to make the selection.

Try out some short-cuts as you go through this chapter. Jane will come across some from time to time, but feel free to try out any you notice that aren't mentioned specifically. The more you can remember and use, the better – they'll save time.

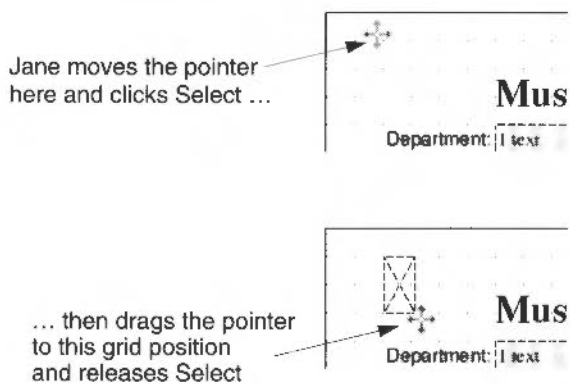
Appendix D: Keyboard short-cuts on page 319 lists the complete range of short-cuts.

Adding pictures

Inserting a background picture

Jane thinks the Music Matters record would be greatly improved with a picture in the top lefthand corner. One of her sales staff is quite artistic and has created several Draw files and Sprite files of musical notes and instruments. She has copied these files onto her work disc and intends to add one of them to her layout by dragging it onto a background field. This picture will then appear on every record in the database. She begins by adding a background field to her layout:

1. She sets the Grid to Show a spacing of 44.
2. Then she chooses **Utilities/Insert/Frames**.
3. Next she positions the pointer (now shaped as four arrows) just above and to the left of the second grid position from the left and the first grid position from the top.
4. Then she clicks Select and drags the pointer to the third grid position from the left and the third grid position from the top.
5. Finally she releases Select and a background field appears:



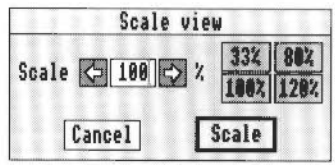
Now that she has created a background field, Jane drags the Draw file called `Clef` (in the `DBtutorial` directory on Data disc A) to her new background field, and releases the Select button. The picture is immediately visible.

For a description of how Draw files and Sprite files are mapped to a background Frame see *Data types* on page 263.

Zooming into the Layout window

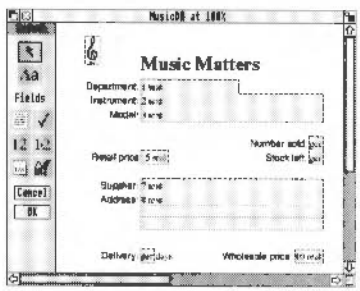
Jane isn't satisfied with the positioning of her title, so she decides to use the **Scale view** option to help her position it exactly where she wants.

1 She turns off the Grid and goes into the **Utilities/Scale view** dialogue box. This shows that the current scale is 100%:



2 Jane increases the scale factor to 300%, and then clicks on the **Scale** button. The contents of the Layout window are now trebled in size:

Default scale (100%)

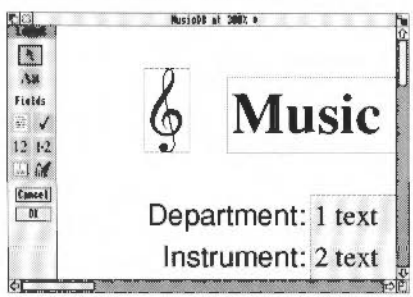


Scale increased to 300%

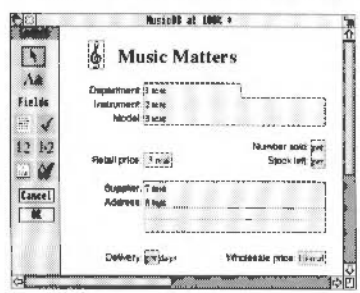
3 Next she goes into Select mode and drags the text, 'Music Matters', to the exact position she wants.

4 Finally she returns to the Scale view dialogue box and clicks on **100%**. She then clicks on **Scale**. The contents of the Layout window are then returned to normal:

Position text exactly



Return to Default scale (100%)



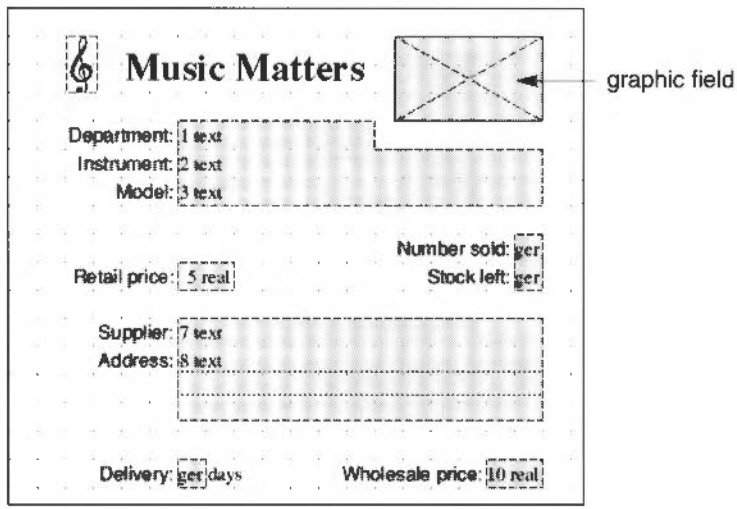
Inserting a different picture on each record

Jane is very pleased with the clef, and thinks it would be a good idea to have a picture on each record that changes depending on which department that record deals with. She does this by creating a field with a data type of **Graphic**.

1 She presses F10 to display the grid, and then clicks on the **Graphic** button in the Toolbox.

2 Next she moves the pointer to the fourteenth grid position from the left and the first grid position from the top. She presses Select and drags the pointer to the 19th grid position from the left and the fourth grid position from the top. She then releases Select.

3 A field with the appearance of an envelope appears, with the default title `<Field name>` to the left of it. Because she does **not** want a field title to appear she immediately presses Return. Her layout now looks like this:



When Jane comes to edit her database in the One Record window, she can now drag a Draw file or Sprite file to each record to make it obvious which department the record refers to. For instance, if the instrument the record deals with is in the percussion department, she would drag a Sprite file of a percussion instrument to that record.

Note: Graphic fields do not have field numbers.

For an example of how to drag a Draw file or Sprite file to a graphic field, see *Dragging pictures to a graphic field* on page 225.

For a description of how Draw files and Sprite files are mapped to a Graphic field see *Data types* on page 263.

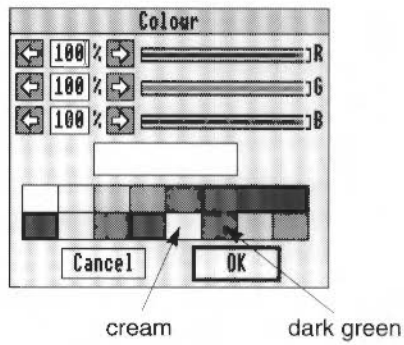
Adding colour and borders

After adding a background picture to every record, and a field allowing her to drag different pictures to it, Jane wants to add the finishing touches to the record. That means using colour. There are three ways you can use colour on a record:

- changing the background colour of the entire record
- changing the colour of text on the record
- changing the background colour of fields and text.

Changing the background colour of a record

Jane decides that a plain white background on her records makes them too stark, a cream colour would be easier on the eye. To change the background colour she goes into the **Utilities/Background colour** dialogue box:



At any time there are sixteen standard colours. These are shown in the boxes at the bottom of the Colour dialogue box. Jane chooses the cream patch (the fifth colour along the bottom row) by clicking on it and then clicking on **OK**.

Mixing your own colour

You can mix your own colours by setting the intensities of red, green and blue in a colour. The intensity of red, green and blue is expressed as a percentage between 1% and 100%. There are three ways of adjusting the intensity:

- Drag a slider to the level you want.
- Click on the number next to a slider, and type in a new value.
- Click on the left and right arrows.

You can start off by clicking on a standard colour, then fine-tuning it to get the colour you want. As you mix a colour, it is shown in the colour mixing box in the middle of the dialogue box. When you have selected the shade you want, click **OK**.

Changing the background colour of fields

Now that the record has a cream background, Jane wants to change the background colour of some of the fields on her layout.

1. She types Ctrl-A. This highlights every field on the layout.
2. Then she moves to the **Effect/Fill colour** dialogue box and selects cream.
3. Now that the entire record is cream, she highlights fields 1, 2, 3, 7 and 8. The fields and their field titles are highlighted. She only wants to change the background colour of the field boxes, so she clicks Adjust on the field titles.
4. Finally she moves to the **Effect/Fill colour** dialogue box and selects white.

Changing the colour of text

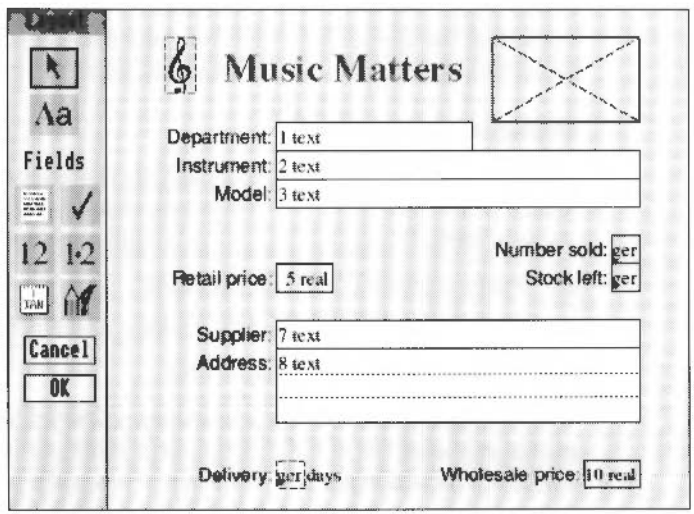
Jane wants to change the colour of the title, so she highlights `Music Matters`, goes to the **Effect/Text colour** dialogue box, and changes the colour to dark green.

Adding field borders

Jane wants to make one final change; she feels that some of the fields should stand out so she decides to put a border around them.

1. She highlights all the fields (including the graphic field) except field 9. Then she clicks Adjust on the field titles of those fields so that only the field boxes remain highlighted.
2. Next she chooses **Effect/Border**.

The final layout of Jane's record now looks like this:



Dragging pictures to a graphic field

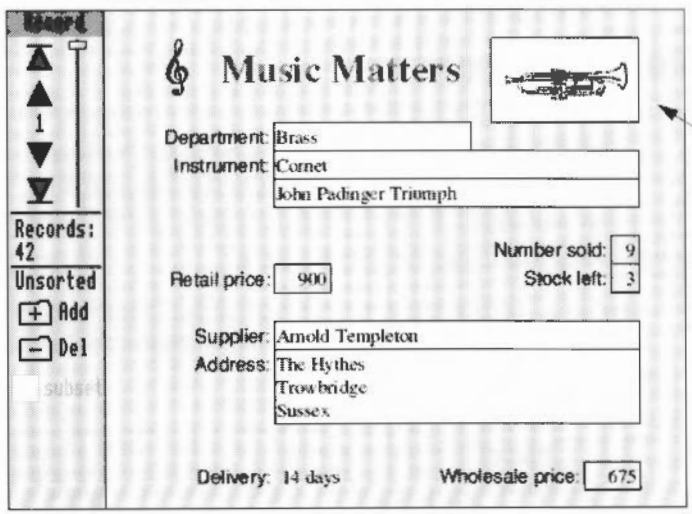
Jane returns to the One record window to complete her editing. All that remains for her to do is to insert a picture of a musical instrument into the graphic field on each record.

1. She begins by displaying the directory on her work disc containing all the Sprites of musical instruments.
2. Then she works through each record, dragging the appropriate Sprite file to the graphic field.

The Sprite files in Jane's directory (these Sprite files are also in the `DBtutorial` directory on Data disc A) correspond to the following departments:

Sprite file	department
`Brass`	Brass
`Guitar`	Guitar
`Keyboard`	Keyboard
`Percussion`	Percussion
`Piano`	Piano
`String`	String
`Woodwind`	Woodwind

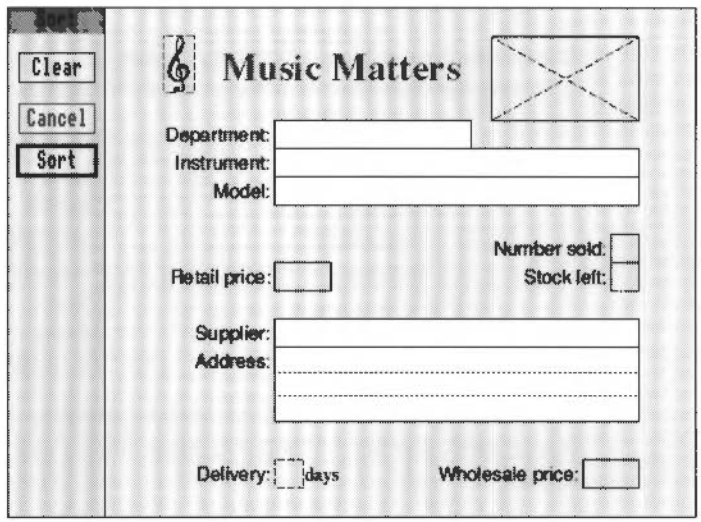
So, for example, if a record contained information about an instrument in the Brass department, she would drag the Sprite file `Brass` to the graphic field on that record:



Sorting records

The Sort window

When Jane created her Music Matters database, the records she typed in appeared in the order in which she entered them. She thinks this is a little slipshod, so she decides to sort her records into logical order. She chooses **Utilities/Sort**. The Sort window then appears (pressing F6 also takes you to the Sort window):



Sorting in ascending order

She begins by sorting her records into ascending order using the Instrument field:

1 She clicks Select in the Instrument field. The text `1 A-Z` appears inside the field. The '1' indicates that this is the first sort field, 'A-Z' indicates that this is an alphabetic field which will be used to sort the records into **ascending** order.

Sort

2 Next she clicks the **SORT** button.

After a few seconds Jane is returned to the One Record window. The records have been sorted into alphabetic order using the contents of the Instrument field box and are now in the following order:

Record 1	Acoustic Guitar
Record 2	Acoustic Guitar
Record 3	Acoustic Guitar
Record 4	Cello
...	
Record 42	Violin

Sorting in descending order

Jane now wants to try sorting the Music Matters database into descending order:

1. She returns to the Sort window. The Instrument field still contains the label `1 A-Z` to show the most recent sort operation.
2. She clicks Select over the Instrument field. The '1' stays, but 'A-Z' is changed to `Z-A`. This indicates that the records will be sorted into **descending** order.
3. Finally she clicks on **SORT**.

The records are then sorted into descending alphabetic order:

Record 1	Violin
Record 2	Violin
Record 3	Violin
Record 4	Viola
...	
Record 42	Acoustic Guitar

Cancelling a Sort

To return to the One Record window without sorting, click on the **Cancel** button.

Clearing a Sort

To clear all sort options you have entered into the Sort window, click on the **Clear** button. All sort options will be removed and you can enter new ones.

Sorting on more than one field

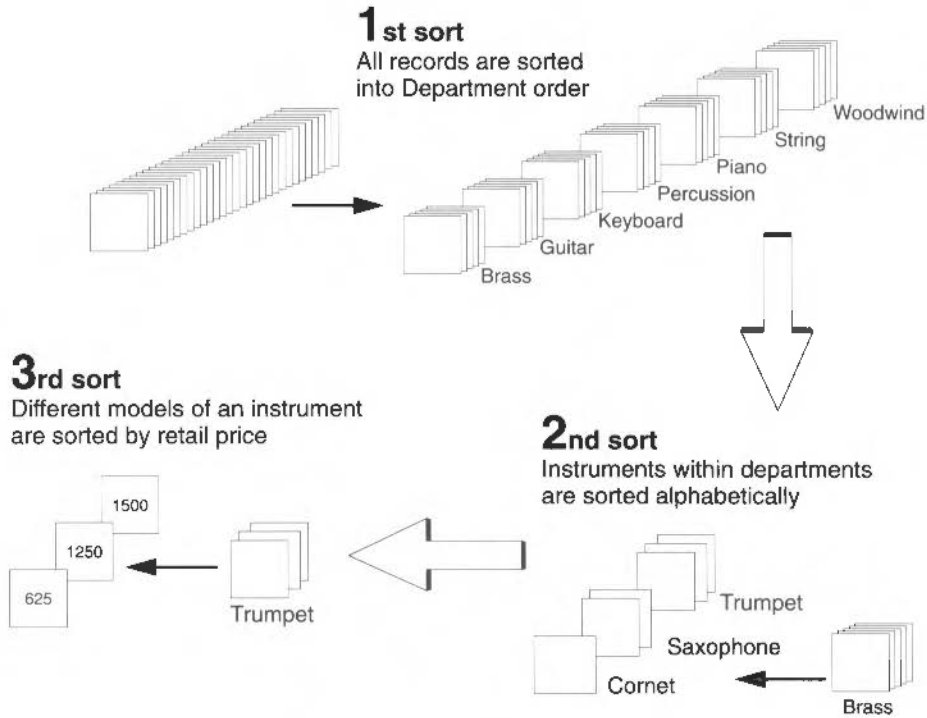
It is often useful to sort records using several fields. For instance, Jane wants to organise the records in her database into the best order for the way she works:

1st sort - by department
Jane thinks of Music Matters primarily as several departments, so she decides to sort all the records into department order. This means that all the records for the Brass department would come first, then all the records for the Guitar department would come next, and so on.

2nd sort - by instrument
Within each department she would like to organise the records into instrument order, so that in the first department – the Brass department – all the records for cornets would come first, then all the records for saxophones, and finally all the records for trumpets.

3rd sort - by retail price

As there can be several models of the same instrument (for example, there are three types of trumpet) she thinks it would be a good idea to sort the records for each particular instrument into retail price order, so that the cheapest trumpet would come first, then the next most expensive, and so on:



To perform these three sorts Jane does the following:

Clear

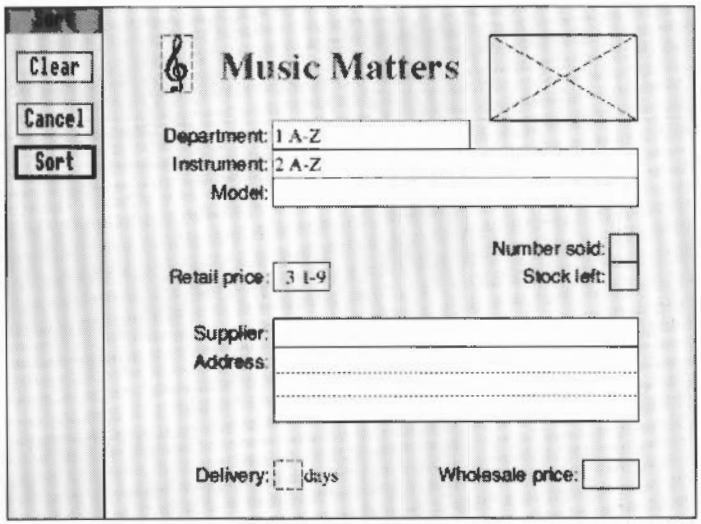
1 She goes into the Sort window and clicks on **Clear**. This deletes any previous sort entries.

2 Then she clicks Select on the field she wants the database to be sorted on first, the Department field. The label `1 A-Z` is displayed.

3 Next she clicks Select on the Instrument field. The label `2 A-Z` is displayed.

4 Then she clicks Select on the Retail price field. The label `3 1-9` is displayed. The '3' indicates that this will be the third field used to sort the records, and '1-9' indicates that this is a numerical field which will be used to sort the records into ascending order.

The Sort window now look like this:



5 Finally she clicks on **SORT**.

The records are sorted into order using the three fields Jane selected, and she is then returned to the One Record window. The records in the Music Matters database are now in the following order:

Record 1	Brass	Cornet	900
Record 2	Brass	Saxophone	1450
Record 3	Brass	Saxophone	1750
Record 4	Brass	Trumpet	625
...			
Record 42	Woodwind	Recorder	130

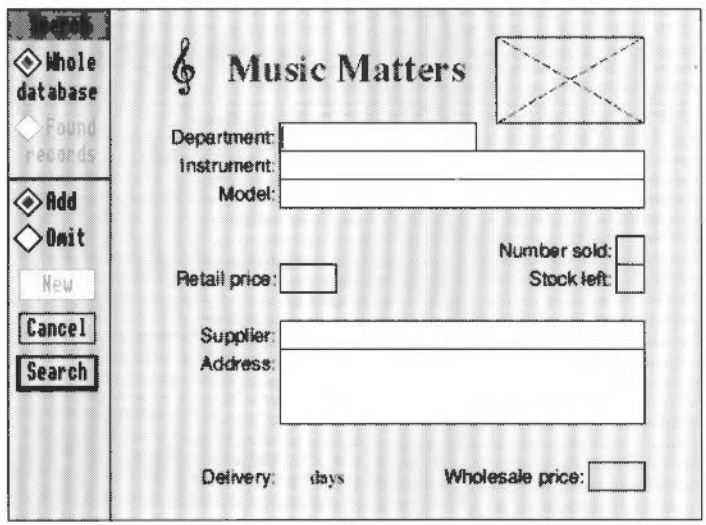
Automatic sorting

Advance Database always remembers the last sort order you specified. After you type in a new record, it is automatically sorted into the correct position within the database using this sort order.

Note: If you clear all the fields in the Sort window, this is equivalent to instructing the database not to sort any new records that you create. Until you specify a sort order, new records will remain at the end of the database.

Searching

Jane sees the search facilities within her database as the key to monitoring how well the different departments in Music Matters are performing. To enter the Search window she chooses **Utilities/Search**. The Search window then appears (pressing F4 also takes you to the Search window):



The Search window displays a blank Music Matters record. You can type text into one or more of the blank fields and then

- search the whole database for all records that match that text in those fields. The records that match your search are put into a subset of the whole database and displayed in the One Record window.
- search the whole database for all records that do **not** match that text in those fields. The records that do not match your search are put into a subset of the whole database and displayed in the One Record window.

If you want to search the whole database again to create a new subset, then you should return to the Search window, click on **New**, type in your new search, and click on **Search**.

If, however, you want to continue working on the subset you have created you can return to the Search window and

- refine your subset by searching the records in it for something else. Only those records that match this second search are then put into a new, smaller subset.
- add to your subset by searching the whole database for a different set of records and adding those to the subset you have already created.

Finding a specific piece of data in a field

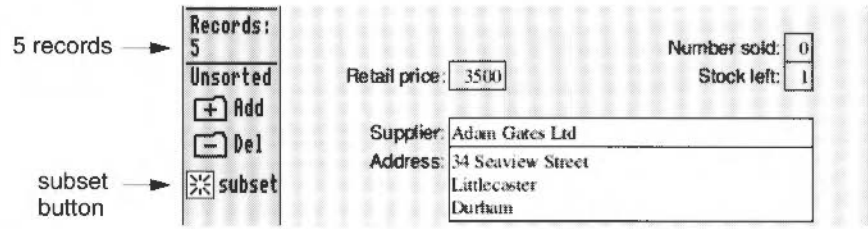
Jane decides that the first thing she wants to do is find out which instruments are not selling at all. To do this she searches her database for every instrument that has got a '0' in the Number sold field box:

1 She moves the pointer to the Number sold field and types in `0`.

Search

2 Then she clicks on the **Search** button.

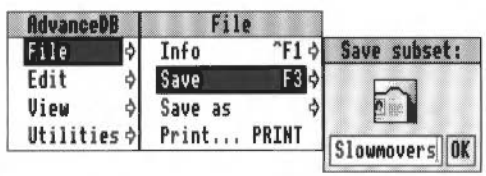
As soon as Jane clicks on **Search**, the whole database is searched for records where the Number sold field contains '0'. When the search is finished, the Search window disappears and Jane is returned to the One Record window. Instead of the 42 records that Jane would normally expect to see, only five records are now contained in this window:



The five records that are displayed in the One Record window are the records that contained fields matching Jane's search. The **subset** button at the bottom of the toolbox is switched on. This signifies that the One Record window is only displaying a subset of the whole database.

Saving a subset

Now that Jane has found the poorest performers in Music Matters she wants to store them into a separate database for further consideration (perhaps she might consign them to the Bargain Basement). She saves the subset by going into the **File/Save** option, typing `Slowmovers` into the Save subset dialogue box, and dragging the icon to her work directory.



Restoring the full database

Jane can display her full database again by clicking on the subset button (clicking on this will toggle between the full database and the subset).

Finding similar pieces of data in a field

Jane wants to find all the records relating to Ivan Bandinski & Son, so she returns to the Search window. This time the **New** button is displayed as available (before it was shown in light grey), giving her the choice of searching the subset she has already created, or searching the whole database and creating a new subset.

Wildcards

Jane starts to type the supplier's name in the Supplier's field but realises she can only vaguely remember how Bandinski is spelt, so she decides to use a **wildcard** character to help her. Wildcards are characters that you can substitute for other characters and are used

- if you can only remember part of the text you wish to find
- if you want to search for slight variations of text.

There are two wildcard characters:

? Using a ? anywhere in a word indicates that any single character can be matched to it. For example, C?op would match to Crop, Chop, Clop and Coop.

* Using a * indicates that any number of characters before or after the search letters can be present as long as the rest matches. For example:

Elec*	would match anything beginning with 'Elec', such as 'Electric'
*tar	would match anything ending in 'tar', such as 'Guitar'
iol	would match anything containing the letters 'iol', such as 'violin'.

To use wildcard characters to help her find all the records relating to Ivan Bandinski & Son, Jane does the following:

1 She types `*Ba*` into the Supplier field.

2 She clicks on **New**.

3 Then she clicks on **Search**.

The whole database is searched and a new subset is created containing only those instruments supplied by Ivan Bandinski & Son.

Note: If Jane had not clicked on the **New** button, only the subset created from her previous search (when she looked for instruments selling badly) would have been searched. This is because once a subset is created, the search window will use that subset for subsequent searches, unless instructed otherwise.

Finding data using operators

As well as searching for fields that match a specific piece of data you can also search for data in a more general way using **operators**. Operators are standard mathematical symbols, such as:

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

The following examples show how these operators might be used to search the Music Matters database.

Note: If you type a search string into a field box, and the string is actually longer than the field box itself, don't worry, you can use the cursor keys to scroll the text you typed in.

Fields above a certain value

You can search for fields that contain numbers or text above a certain value using the greater than (>) or greater than or equal to (>=) operators:

Department: >K	Search for all Departments that start with a letter after K (e.g. Percussion and String, but not Keyboard).
Delivery: >=21	Search for all Delivery fields that contain a value greater than or equal to 21.

Fields below a certain value

You can search for fields that contain numbers or text below a certain value using the less than (<) and less than or equal to (<=) operators:

Department: <G	Search for all Departments that start with a letter below G.
Delivery: <=28	Search for all Delivery fields that contain a value less than or equal to 28 (i.e. a delivery of 28 days or less).

Fields not equal to a certain value

You can search for fields that contain numbers or text not equal to a particular value using the not equal to (<>) operator:

Department: <>Brass	Search for all Departments that are not equal to Brass (i.e. all departments except Brass).
Delivery: <>28	Search for all Delivery fields that contain a value not equal to 28 (i.e. all deliveries other than 28 days).

Fields between two values

You can search for fields that contain numbers or text that lie within a specific range by using operators combined with the AND operator:

Department: (>=C) AND (<T)	Search for all Departments that start with a letter greater or equal to C and below T.
Delivery: (>20) AND (<29)	Search for all Delivery fields that contain a value between 21 and 28.

Fields containing one of several values

You can search for fields that contain one of two or more values using the OR operator:

Department: (Brass) OR (String)	Search for all Departments that are either Brass or String.
Delivery: (7) OR (>14)	Search for all Delivery fields that contain a 7 or a value greater than 14.

Combining operators

You can combine the AND and OR operators to search for fields that lie within a specific range, or satisfy one or more other conditions:

Delivery: (>14) AND (<29) OR 7	Search for all Delivery fields that contain a value between15 and 28, **or** contain a 7.

Finding data in two or more fields

Jane has decided to search the Music Matters database for all instruments that sell quickly but have a long delivery period. She is worried that the shop might run out of their most popular instruments and that, rather than waiting for new ones to be delivered, customers might go elsewhere to buy them. So, to ensure sufficient stocks of their best selling products, she performs the following search:

1. She goes to the Search window and types >14 into the Delivery field.
2. Next she types >4 into the Number sold field.
3. Finally she clicks on **New**, and then clicks on **Search**.

The database is searched and thirteen records are found answering both these conditions.

Leaving the Search window

Cancel

If you are in the Search window, and you want to return to the One Record window without searching for any data, click on the **Cancel** button.

Refining a subset

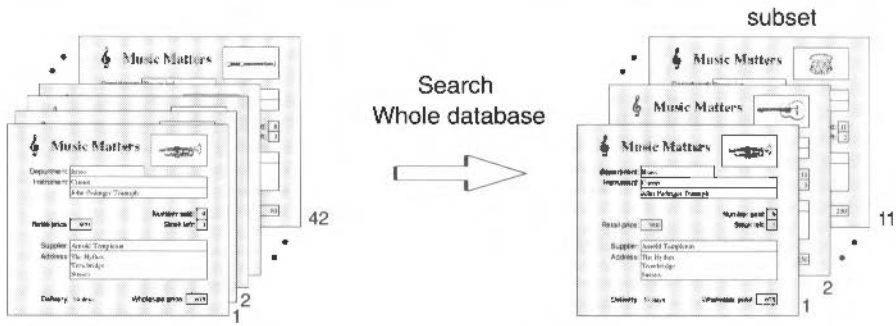
Jane has a few ideas for new window displays, but first she wants to create a subset that contains all the best selling instruments.

1 She types >8 into the Number sold field.

2 Then she clicks on **New**.

3 Finally she clicks on **Search**.

The database is searched and, from the original total of 42 records in the whole database, 11 records are found and placed in the One Record window:



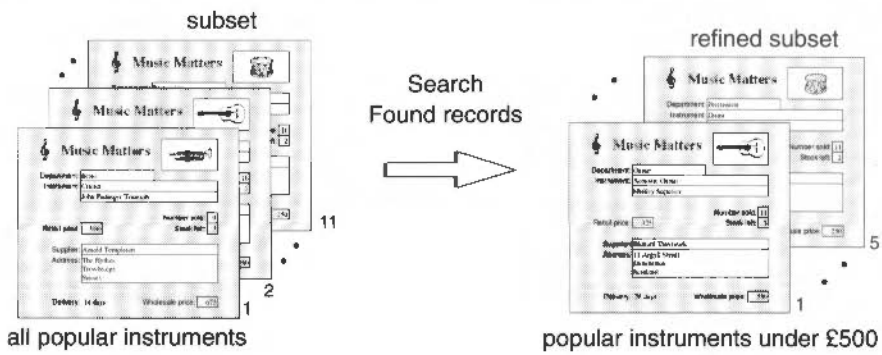
Jane now wants to perform further searches on this subset. One idea she has is to create a window display of all the most popular instruments under £500. She has already created a subset of popular instruments, so to perform this second search:

1 She returns to the Search window and types <500 into the Retail price field.

2 She checks that the **Found records** and **Keep** buttons are on. These restrict the search to the current subset instead of the whole database.

3 Finally she clicks on **Search**.

The subset is searched and five instruments are found and put into the new subset:



Adding records to a subset

Jane looks at the five records in her subset and notices that four are guitars and only one is a drum. She would much prefer a window display with more drums so she goes back to the Search window and does the following:

1 She types `<600` into the Retail price field.

2 Then she types `Percussion` into the Department field.

3 Next she clicks on **Whole database**. This forces the search to use the whole database, and add any records it finds to the records already in the subset. The button above the **Omit** button will change from displaying **Keep**, to displaying **Add**, as a reminder of this.

4 Finally she clicks on **Search**.

The whole database is searched and two records (both drums) are found. These are added to the subset bringing the number of subset records to seven (four guitars and three drums).

Removing unwanted records

As well as searching for records and placing them in a subset, you can also search for records that do **not** match your search data and put those into a subset. For instance, Jane wants to create a subset containing every instrument **except** for those supplied by Charles Stanton Ltd, so she goes to the Search window and

1 types `Charles Stanton Ltd` into the Supplier field

2 clicks on **OMIT**

3 clicks on **New**, and then clicks on **Search**.

The database is searched and forty records are put into a new subset. The two instruments supplied by Charles Stanton Ltd are omitted from the subset.

Finding a specific date

Although there are no fields in the Music Matters database that have the data type **Date**, you can search for dates in other Advance databases using several formats.

For example, you could search for the month of February in a field box with the field type **Date** by typing in any of the following:

26 02 91 26 Feb 12 2 102 BC

You can also search for a range of dates by using operators. For example:

(>Feb 1990) AND (<March 1991)

would find any date between, and including, March 1990 and February 1991.

For details of all the date formats see *Data types* on page 263.

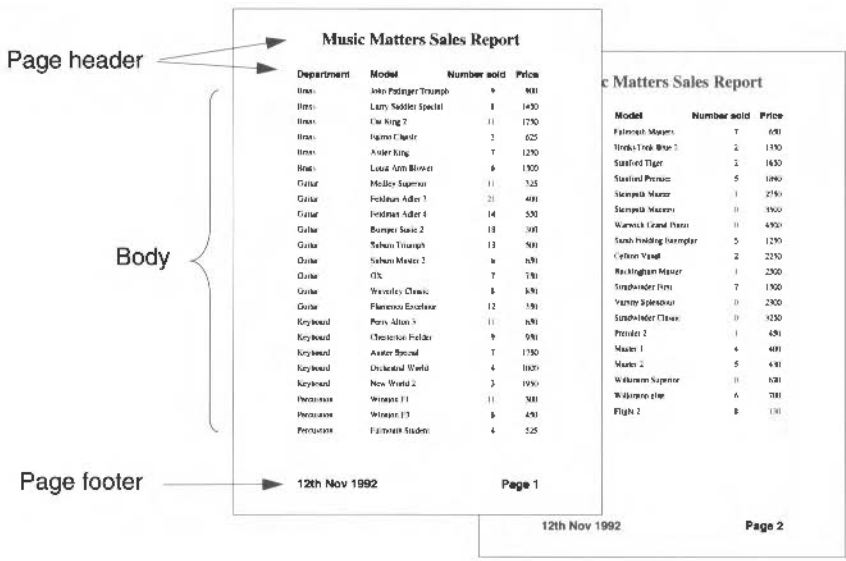
The Report Editor

Although it is possible to save your database as a simple text file (using the Report option in the Save menu, described in *Saving data in different formats* on page 268), it is far more useful to create a report using the Report Layout editor. The Report Layout editor allows you to organise your data into a fully laid out report. In particular you can

- design a title to appear on the first page
- specify which fields should be included in the report
- include special summary fields that add up the contents of fields
- create column headings that will appear on every page
- include page numbers and the current date on every page.

Creating a simple report

The structure of a simple report can be represented as follows:



Page header	This is material that appears at the top of every page. For example; column headings or a report title.
Body	This contains fields from your database. It appears on every page between the Page header and Page footer.
Page footer	This contains information that appears at the bottom of every page. For example; page numbers, a date, a subtitle.

Jane has been asked to prepare a report for Bob Davies which summarises the sales figures for Music Matters. To prepare the report she uses the Report Layout editor.

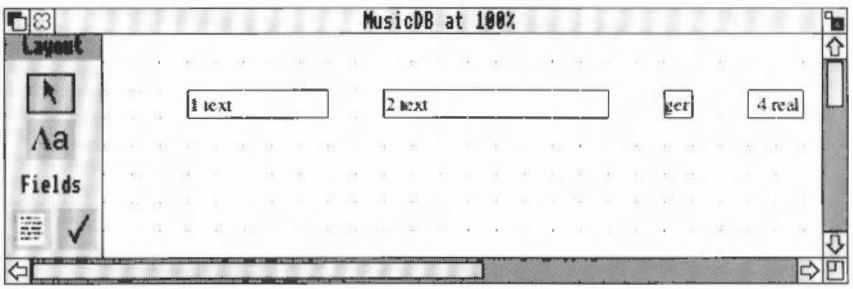
The Report Layout editor

The Report Layout is separate from the Music Matters layout Jane has already created. To go to the Report Layout window in the Music Matters database, she opens `MusicDB` and then chooses **View/Report**. The Report window opens. At this stage the Report window looks very similar to the ordinary One record window. She then chooses **Edit/Edit layout**. The Report window closes and the Report Layout window opens. This window is identical to the ordinary layout window, but can be used to create a special layout used **only** by the Report window.

Body area

Jane's first task is to edit the existing layout so that it becomes the **body** of her report. The body of a report usually consists of a row containing one or more fields from the database layout. When the report is generated this row is repeated for every record in the database, forming a series of columns. The report that Jane is preparing will contain four columns.

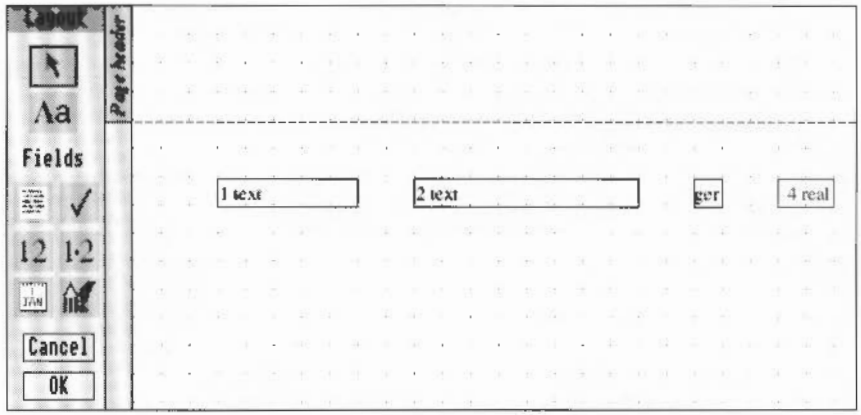
1. She begins by deleting all fields and text in the layout except the 'Department', 'Model', 'Number sold' and 'Retail price' fields. When all the other fields are deleted these four fields are automatically renumbered 1, 2, 3 and 4 respectively.
2. Next she puts the grid on, then goes into the **Background colour** option in the Utilities menu and changes the background colour to white.
3. Then she deletes all four field titles, and shortens fields 1 and 2.
4. Next she changes the background colour of fields 3 and 4 to white.
5. Finally she drags the four fields so that they form a row:



Page header area

Jane now wants to create a large title and some column headings.

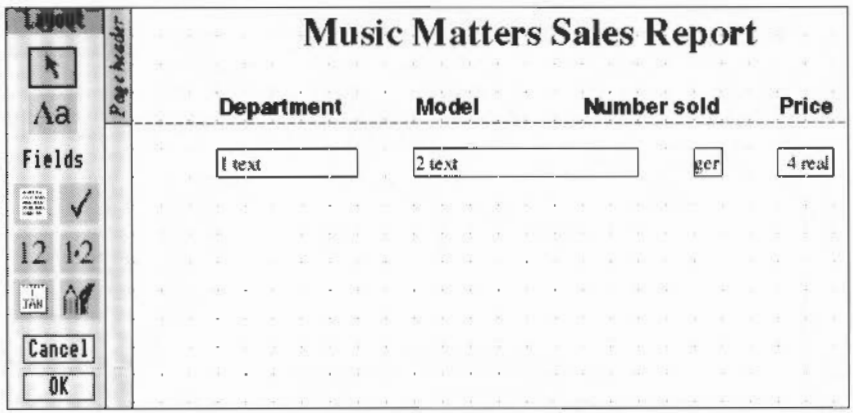
1 She chooses **Utilities/Header/Footer/Page header**. A dotted line appears four grid units from the top of the window. The four fields are automatically moved below this line. A column appears between the toolbox and the window and the words 'Page header' appear inside this column:



2 Jane now goes into Text mode and types `Music Matters Sales Report` at the top of this area. She changes the size of the text to 24 pt, and makes it bold.

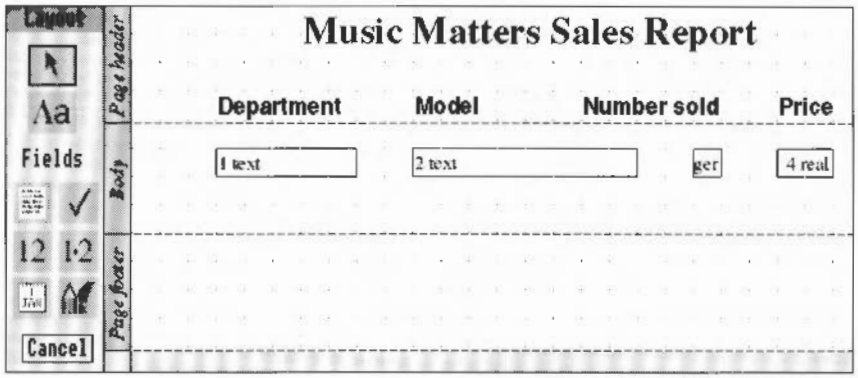
3 Next she enters the headings `Department`, `Model`, `Number sold` and `Price` near the bottom of the Page header area. She changes the size of all the words to 14 pt, and changes the font to Homerton bold. She uses the grid to line the text up with the four boxes so that they can act as column headings.

4 Finally she drags the boxes so that they are just underneath the header area:



Page footer area

Jane now wants to add in a page number and today's date at the bottom of each page in the report. She chooses **Utilities/Header/Footer/Page footer**. A Page footer area now appears, and each of the three areas is indicated in the column to the right of the toolbox:

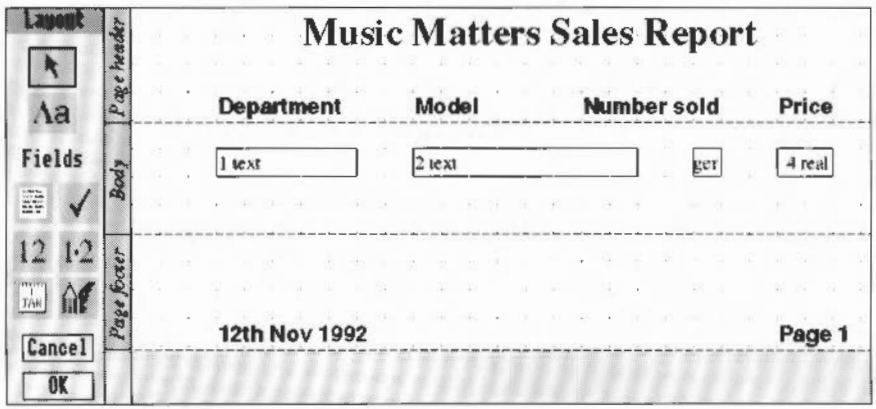


Inserting the current date

Jane goes into Text mode and clicks in the bottom left of the Page footer area. After the caret appears she chooses **Utilities/Insert/Current date**. The current date appears to the right of the caret.

Inserting page numbers

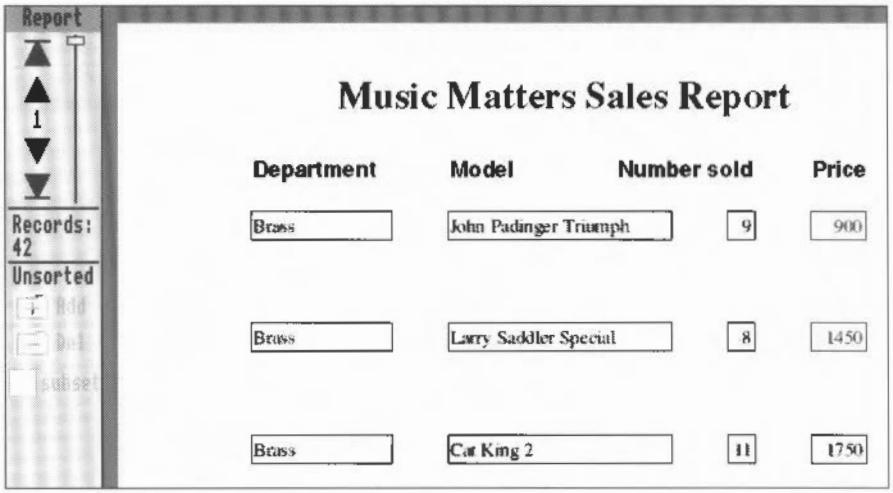
Still in Text mode, Jane now clicks in the bottom right of the Page footer area. After the caret appears she types in the word Page followed by a space. Then she chooses **Utilities/Insert/Page number**. The page number appears to the right of the text she typed in:



The Report Window

Jane hasn't finished editing her Report layout yet, but she wants to see how the report will look as it currently stands, so she saves the layout as normal, using the **File/Save** option.

Then Jane clicks on **OK**. The Report Layout window closes and the Report window opens. After scrolling the window to the left she sees the following:

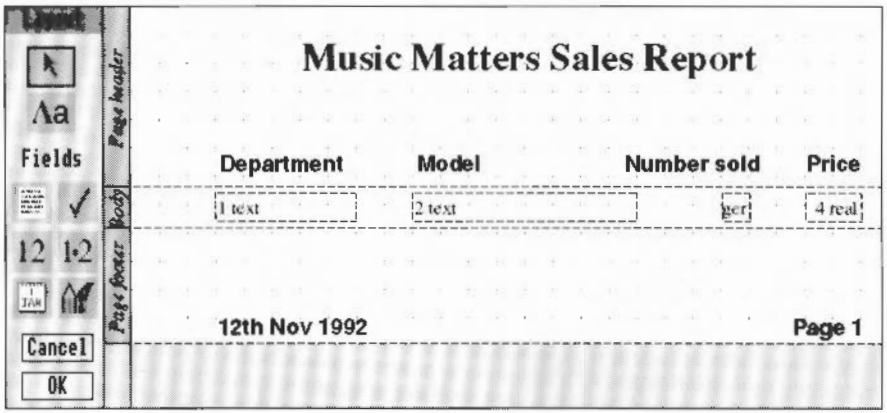


The Report window displays each page in the report as if it were a sheet of A4 paper, as this is how it will appear when printed. When Jane scrolls down the report she can see that each page has the full title at the top, and the page number and current date at the bottom. However, there are several things on the report that can be improved, so she returns to the Report Layout editor to make some changes.

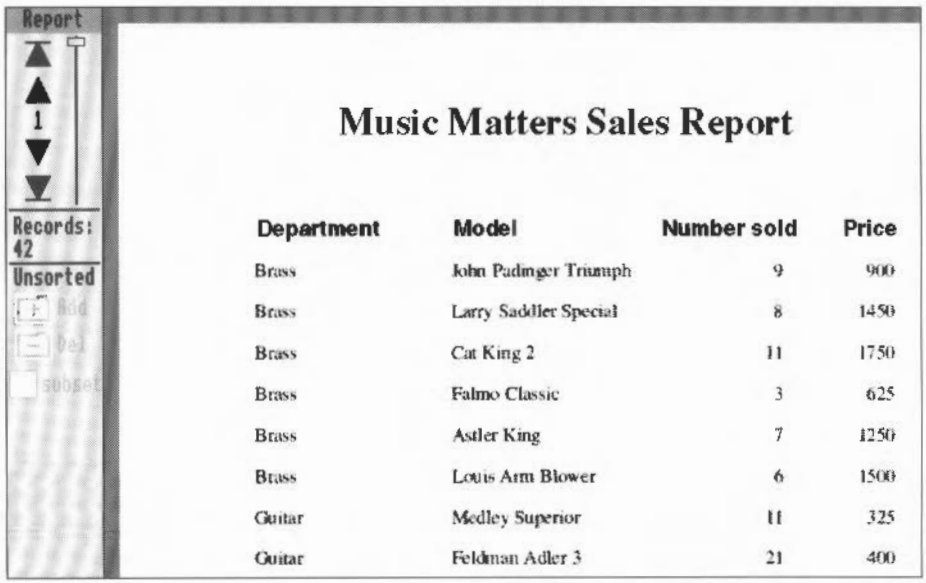
1. The first improvement she makes is to remove the field borders from the four fields (by highlighting them all and choosing **Effect/Border**).
2. The rows are too widely spaced at the moment in the actual report, so the next improvement she makes is to close up the Body area. She selects the four fields and moves them up so that they are just beneath the bottom of the Page Header area. Then she positions the pointer over the dotted line at the bottom of the Body area. The pointer changes into a double arrow to signify that it can be used to enlarge or reduce the Body area. She drags the dotted line up so that it is just beneath the four fields.
3. The next change she makes is to move fields 3 and 4 to the right, as the Number sold field is too close to the Model field. She then moves the page number in the Page footer area to the right so that it lines up with the Price field again.

4 The final change she makes is to increase the space between the title, 'Music Matters Sales Report', and the column headings. She clicks on the dotted line at the bottom of the Page header area and drags it down. She then highlights the column headings (Department, Model, Number sold and Price) and drags them down so that they are once more at the bottom of the Page header. She then lines them up against the four fields, but this time she moves the text, 'Number sold', slightly to the right.

The final edited layout now looks like this:



When Jane clicks on OK to go to the Report window, her amended report is much clearer:

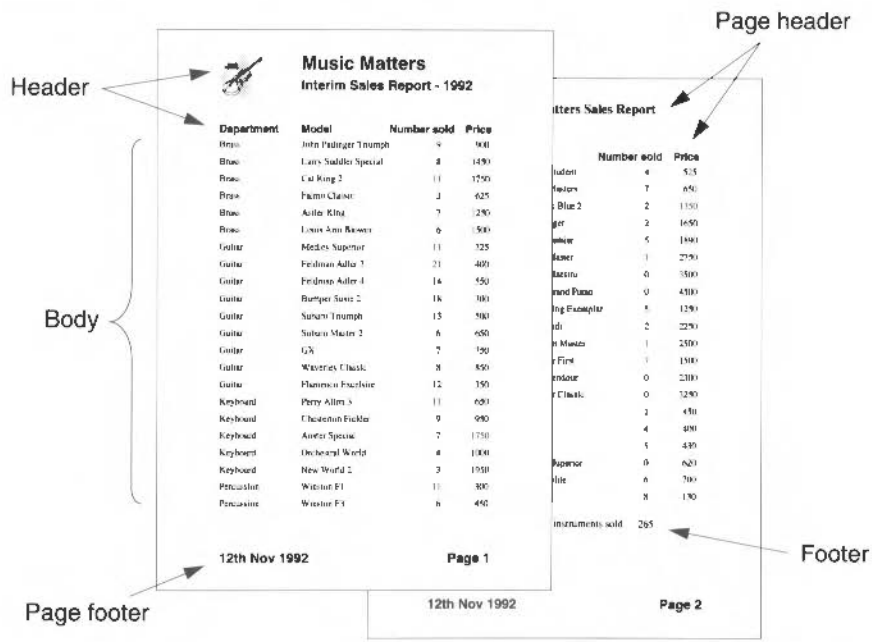


Department	Model	Number sold	Price
Brass	John Padinger Triumph	9	900
Brass	Larry Saddler Special	8	1450
Brass	Cat King 2	11	1750
Brass	Falmo Classic	3	625
Brass	Astler King	7	1250
Brass	Louis Arm Blower	6	1500
Guitar	Medley Superior	11	325
Guitar	Feldman Adler 3	21	400

Creating a full report

Jane is pleased with her report so far, but she knows that she has to include some calculations in it before it is ready to hand over to Bob Davies. The final stage is to convert her simple report into a full report. This involves returning to the Report Layout window and using the Header and Footer options again, so that the report looks more professional and includes summaries of all the figures.

The structure of a full report is slightly different from a simple report; it contains five areas instead of three:



Header	This is material that only appears at the top of the first page.
Page header	This is material that appears at the top of every page except for the first page. For example; column headings or a subtitle.
Body	This contains text or fields from your database. It appears on every page.
Page footer	This contains information that appears at the bottom of every page. For example; page numbers or a date.
Footer	This contains fields that total, count, or average entire columns of data. The contents of this area are positioned immediately after the Body area on the last page of the report.

The difference between the two types of report can be summarised as follows:

Simple report

Page header	*Page header*	appears at the top of every page
Body	*Body*	appears on every page between the Page header and the Page footer
Page footer	*Page footer*	appears at the bottom of every page

Full report

Header	*Header*	appears only at the top of page 1
Page header	*Page header*	appears at the top of every page except page 1
Body	*Body*	appears on every page between the Page header and the Page footer
Page footer	*Page footer*	appears at the bottom of every page
Footer	*Footer*	appears on the last page beneath the Body area

A full report differs from a simple report as follows:

- The Header area only appears on the first page; it can be used to create a full front page heading.
- The Page header area only appears on page 2 onwards. It can be used to supply a title and column headings that will only appear on page 2 onwards.
- The Body and Page footer areas remain identical; they appear on every page.
- A new summary area is available (the Footer) which will only appear on the last page, immediately beneath the final row of data in the Body area.

Header area

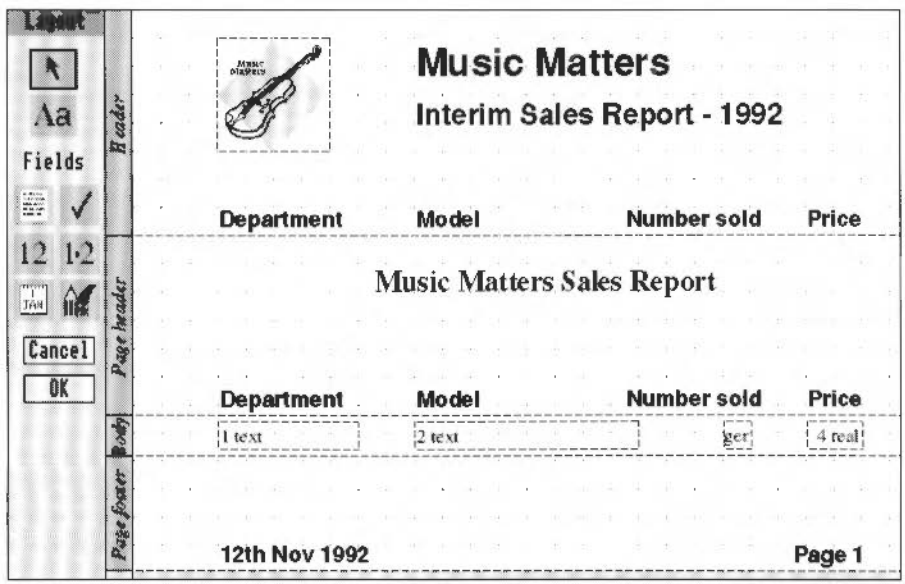
Jane wants to create a more interesting title on the front page of her report, so she returns to the Report Layout window, puts the grid on, and does the following:

1. She chooses **Utilities/Header/Footer/Main header**.
2. A Header area appears above the Page header area at the top of the layout. Jane wants this area to be larger, so she moves the pointer over the dotted line at the bottom of the new area and drags it down several grid units.
3. She wants the Header area to have the same column headings as the Page header area, so she highlights the column headings in the Page header area, copies them, and then pastes them into the Header area using Ctrl-V.
4. She then creates a background field in the top left of the Header area using **Utilities/Insert/Frames** (described in *Inserting a background picture* on page 220), and drags the Draw file `MMTitle` to it.
5. Finally she goes into Text mode and types in `Music Matters` and `Interim Sales Report - 1992`. She changes all this text to Homerton bold, and changes 'Interim Sales Report – 1992' to 18pt, and 'Music Matters' to 24pt.

Changing the Page header

The Page header will only appear on page 2 onwards, so, to make 'Music Matters Sales Report' appear as a subtitle, Jane reduces its size to 18 pt.

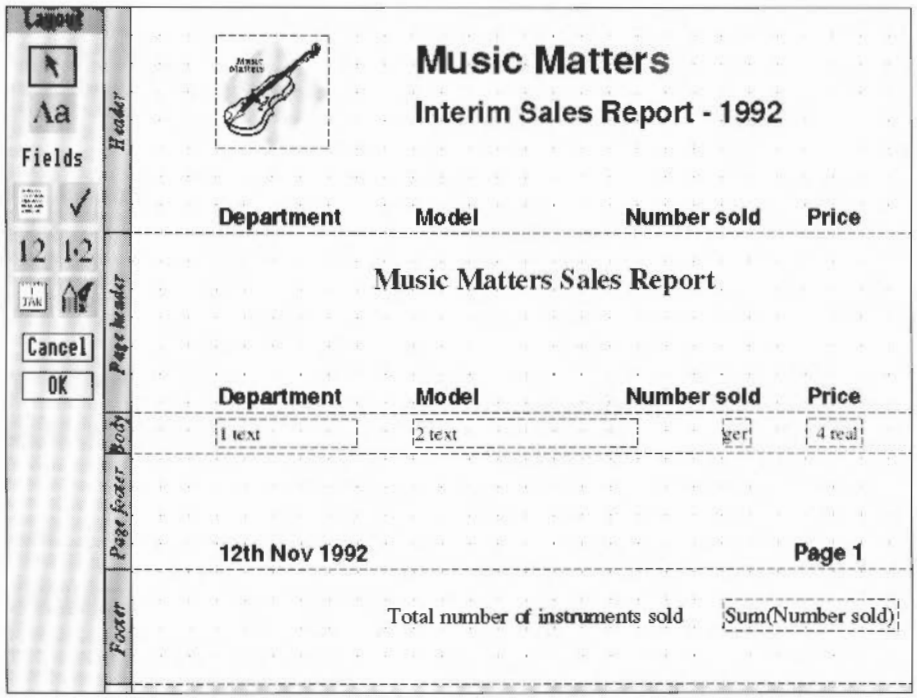
The layout now looks like this:



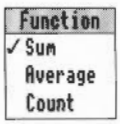
Footer area

Jane now wants to add a summary field on the last page of her report; in particular, she wants to display the total number of instruments sold.

1. She chooses **Utilities/Header/Footer/Main footer**. A Footer area appears below the Page footer area at the bottom of the layout.
2. She highlights the Number sold field in the Body area and drags it down to the Footer area. When she releases Select a highlighted copy of this field is displayed with 'Sum' inside it. She widens the field so that all the text inside it 'Sum(Number sold)' is visible.
3. Then she goes into Text mode, and types in `Total number of instruments sold` to the left of the summary field.
4. Finally she highlights the new field and text, and changes them to Trinity 14 pt.



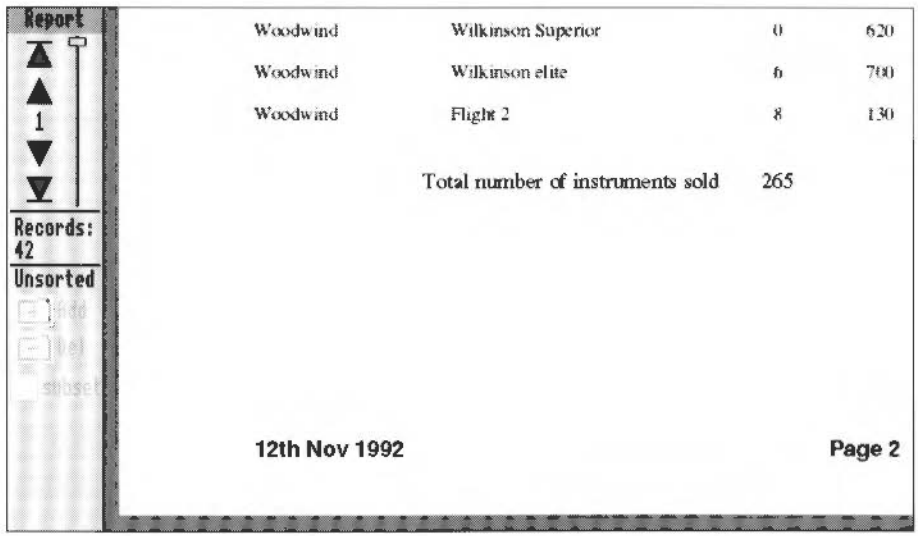
Summary fields



Summary fields can add up the figures in a column, average the figures displayed in a column, or just count up the number of records in a report. To change the function of a summary field, highlight it and then go into the **Edit fields/Function** submenu and click on Sum, Average or Count.

Jane clicks on **OK** to go back to the Report window. She checks her new Header at the top of the first page.

Then she scrolls to the end of the report to check that her summary field is correct.



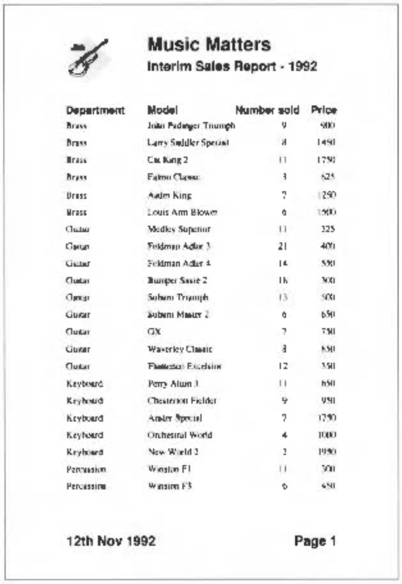
Deleting a Header, Page header, Page Footer or Footer

To delete a header or footer in the Report Layout, go into the **Utilities/Header/Footer/Add/Remove** menu and deselect it by clicking on it.

Printing a report

Jane has checked over her report in the Report window and is satisfied with it. She now wants to print it, so, after ensuring that she has a suitable printer correctly connected and set up, and that the !Printers application is loaded onto the icon

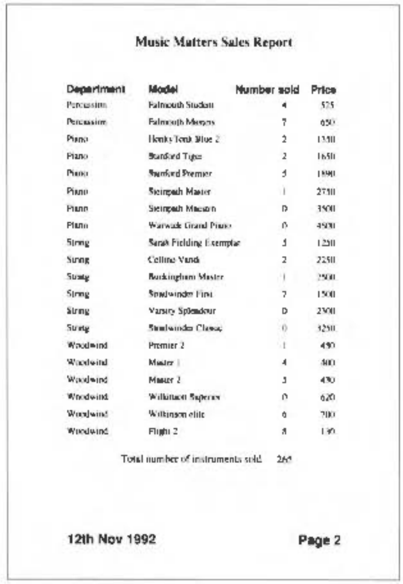
bar, she presses the Print button on the keyboard. The Print dialogue box is now displayed. She wants to print the entire report, so she clicks on **All**. Then she clicks on **Upright**, and finally she clicks on **Print** to send the Report to the printer.



Music Matters
Interim Sales Report - 1992

Department	Model	Number sold	Price
Brass	John Padinger Triumph	9	900
Brass	Larry Saddler Special	8	1450
Brass	Cat King 2	11	1750
Brass	Falmo Classic	3	625
Brass	Adam King	7	1250
Brass	Louis Arm Blower	6	1500
Guitar	Medley Superior	11	325
Guitar	Feldman Adler 3	21	400
Guitar	Feldman Adler 4	14	550
Guitar	Bumper Susie 2	16	300
Guitar	Subeni Triumph	13	500
Guitar	Subeni Master 2	6	650
Guitar	GX	7	750
Guitar	Waverley Classic	8	850
Guitar	Flamenco Excelsior	12	350
Keyboard	Perry Alum 3	11	650
Keyboard	Chesterton Fielder	9	950
Keyboard	Amber Special	7	1750
Keyboard	Orchestral World	4	1000
Keyboard	New World 2	2	1950
Percussion	Winston F1	11	300
Percussion	Winston F3	6	450

12th Nov 1992 **Page 1**



Music Matters Sales Report

Department	Model	Number sold	Price
Percussion	Falmouth Student	4	525
Percussion	Falmouth Masters	7	650
Piano	Honky Tonk Blue 2	2	1350
Piano	Stanford Type	2	1650
Piano	Stanford Premier	3	1890
Piano	Steinpath Master	1	2750
Piano	Steinpath Maestro	0	3500
Piano	Warwick Grand Piano	0	4500
String	Sarah Fielding Exemplar	3	1250
String	Celline Vandi	2	2250
String	Buckingham Master	1	2500
String	Sandwinder First	7	1500
String	Varsity Splendour	0	2300
String	Sandwinder Classic	0	3250
Woodwind	Premier 2	1	450
Woodwind	Master 1	4	400
Woodwind	Master 2	3	430
Woodwind	Wilkinson Superior	0	620
Woodwind	Wilkinson elite	6	700
Woodwind	Flight 2	8	130

Total number of instruments sold 264

12th Nov 1992 **Page 2**

Saving a report

Jane decides she would also like to save her report as a plain text file, without any pictures, but laid out in the same format as it appears in the Report window. She does this by choosing **File/Save as/Report**. Note that if you save a Report text file for a database which has a field of type 'boolean', the values of the boolean fields are not output in the text.

File/Save as/Draw saves the current page as a Draw file (including any pictures).

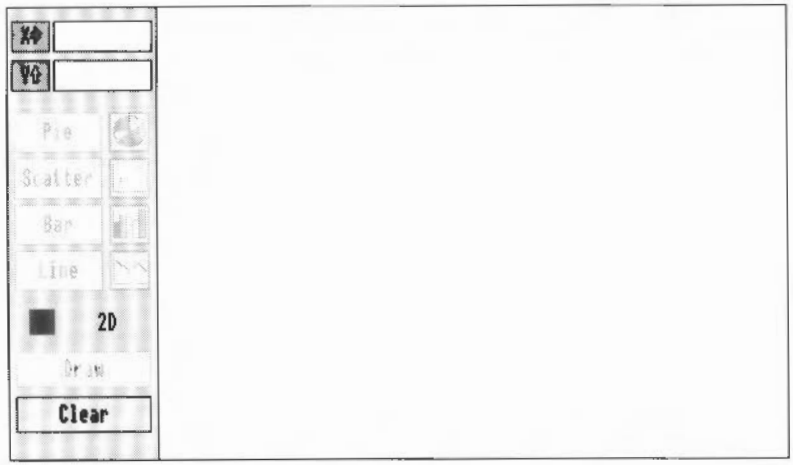
File/Save as/CSV and **File/Save as/TSV** can only be used to save the entire database, **not** the report.

Creating other reports

To overwrite an existing Report layout, go into the Report Layout editor and choose **Edit/Delete layout**. This will delete the existing Report layout and replace it with the ordinary database layout. You can then create a new Report layout.

Creating graphs

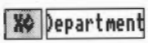
Jane wants to get a quick overview of how many instruments have been sold by each department, and she thinks a bar chart would show this very nicely. To create a bar chart using data from Music Matters, she opens `MusicDB` and chooses **Utilities/Graph**. The Graph window appears.



The Graph window is divided into two parts: a blank area for displaying the graph, and a series of options allowing you to define exactly what sort of graph you want.

1 Jane moves the pointer over the **X data** button at the top left of the window. The pointer changes into a small pointer attached to a tiny menu:

2 She clicks Menu and a list of the fields in the Music Matters database appears.



3 Jane moves down the list and clicks on the **Department** field. The list disappears and the name of this field is displayed next to the **X data** button.

4 Then she moves the pointer over the **Y data** button, clicks Menu, and when a list of the fields in the Music Matters database appears, she clicks on **Number sold**.

Four different types of graph are available depending on the sort of data to be plotted. These are

- **Bar** charts
- **Scatter** graphs
- **Pie** charts
- **Line** graphs.

Three of these are highlighted to show that they are available to plot Jane's data. The only type of graph she cannot choose, and which is not highlighted, is **Scatter**.

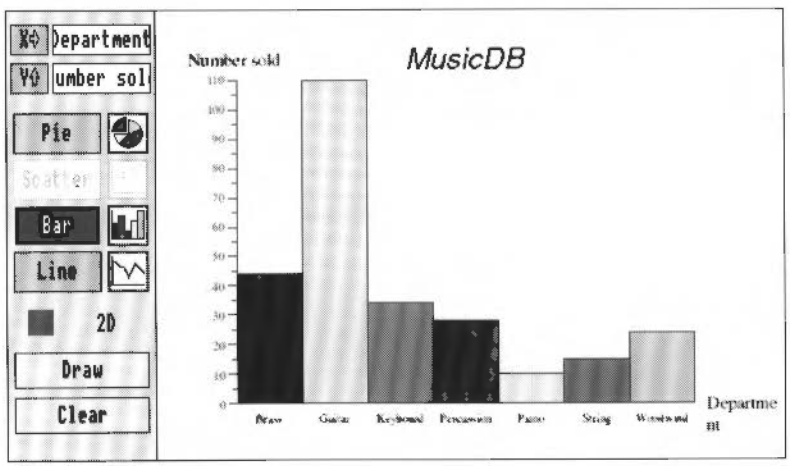
Bar

5 To display the data as a bar chart she clicks on the **Bar** button, which is then highlighted in black.

6 Keys are displayed on graphs by default, but Jane doesn't want a key to appear on this particular graph, so she moves the pointer over the graph display area, goes into the **Graph/Options** submenu, and makes sure that the Key option is not ticked.

Draw

7 Finally she clicks on **Draw**; the bar chart is then displayed in the blank area:



Moving an axis title

The X axis title (`Department`) at the bottom right corner of the graph is slightly too long to fit into the graph display area, so Jane highlights the title and drags it down and to the left to make it fully visible.

Displaying a pie chart in 3D

Jane is pleased with her bar chart but she wants to see what the same data would look like as a 3D pie chart, with the highest selling department 'exploded', i.e. separated from the rest of the pie. This would instantly make it clear which department sells the largest number of instruments.

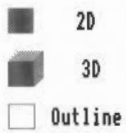
1 She clicks on the **Pie** button and then clicks on the **Pie type** button to the right of the **Pie** button. Clicking on this button cycles around three options: whole pie chart, one segment exploded, and all segments exploded. She selects the one segment exploded option.

 whole

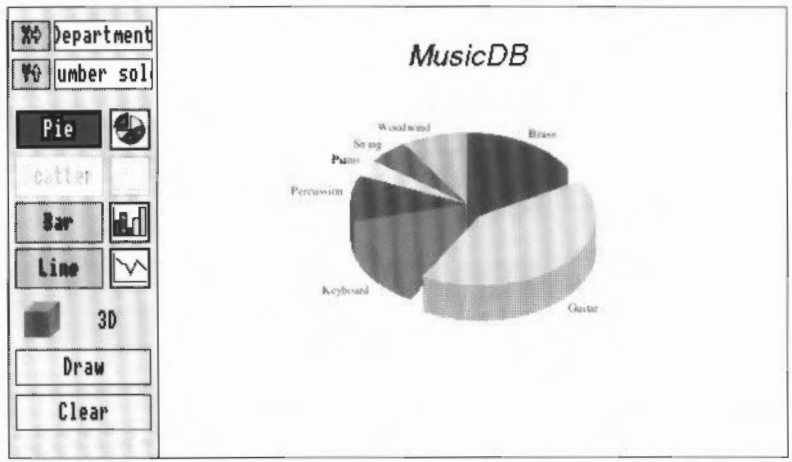
 one segment exploded

 all segments exploded

2 She moves to the **2D** button. As she clicks on this button it cycles around three options: 2D, 3D, and outline. She selects **3D** (by leaving it displayed).



3 Then she clicks on **Draw**, and the pie chart is displayed in 3D:



Improving the appearance of a graph

Changing the title

By default the title that appears on a database graph is the name of the database file. Jane wants to change this to something more informative. She double clicks on the title, `MusicDB`. A caret appears in the text and she changes the title to `Number of instruments sold`. When she comes to the end of 'sold' she presses Return. This takes her to a new line, and she types in `by Department`. This second line is automatically centred beneath the first line.

Moving the pie chart

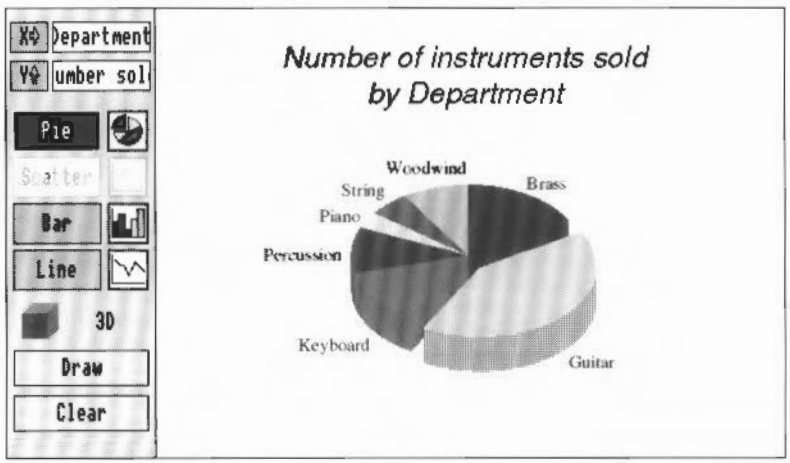
Jane now decides to move the pie chart down slightly.

1 She moves the pointer away from the title and clicks on a blank part of the graph. The pointer changes from a caret back to an arrow.

2 She then moves the pointer to the bottom left of the piechart (just below and to the left of 'Keyboard'), clicks Select and, holding the Select button down, moves the pointer above and to the right of 'Brass' and then lets go. The pie chart and all the text on the pie chart are highlighted. She moves the pointer over the pie chart and drags the chart and text down.

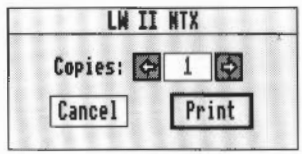
Changing the labelling on the pie chart

While the chart and text are still highlighted Jane chooses **Effect/Text size/24 pt**. The text is re-displayed at the new, larger size. She then clicks on the pie chart and text to deselect them. Finally she drags three of the pie labels – String, Woodwind and Brass – so that they are positioned more legibly:



Printing a graph

Jane wants to print the pie chart now. Before she tries this, she makes sure that she has a printer correctly connected and set up, and that the !Printers application is loaded onto the icon bar. She then presses the Print button on the keyboard. When the Print dialogue box appears she clicks on **Print**:



When the graph is drawn on the printer it fills an entire A4 sheet of paper.

Saving a graph

Jane could have saved her file as a Draw file by choosing **File/Save as Draw**. She would then have been able to edit the graph inside Draw. Alternatively she could have saved her file as a Graph data file. Graph data files allow you to re-create a graph quickly and easily without opening the Database first.

For a full description of saving a graph as a Graph data file, and then using this file to re-create the same graph, see the section entitled *Saving a graph* on page 295.

Quitting the Graph tool

Jane now wants to quit the Graph tool and return to her database, so she clicks on the close icon in the top left corner of the graph window. A dialogue box appears allowing her to save her graph as a file, or quit the Graph tool without saving her graph. She clicks on **Discard** to quit the Graph tool without saving her graph.

For a full description of the Graph tool see the chapter entitled *The Graph tool* on page 273.

In the following section, Jane imports a CSV file into a new database she has created. The rest of this chapter then describes some facilities that Jane has not used, and provides more detail about features she has used already.

Importing data from other files

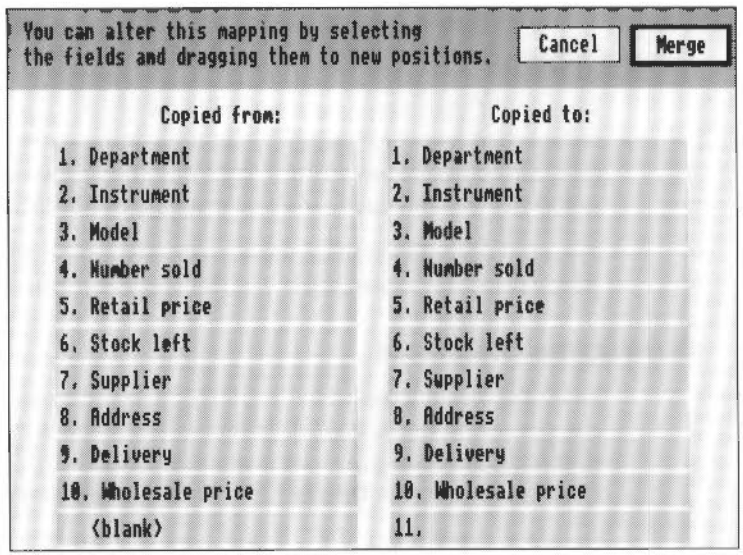
As well as entering data directly into an Advance database you can also import data into it from other files. The types of file you can import are:

- CSV (Comma-Separated Values) files
- TSV (Tab-Separated Values) files
- other Advance Database files.

For a description of CSV and TSV files, and in particular the format of a CSV file, see *Importing data from a CSV file* on page 214.

Importing data from CSV and TSV files

If you are in an Advance database and you wish to import data from a CSV or TSV file, all you have to do is drag the file onto the toolbox in your One Record window and release Select. A Mapping window will then appear and you can either accept the mapping as it stands or change it to something more useful. For example, when Jane imported a CSV file containing 40 Music Matters records into her own database (described in *Importing data from a CSV file* on page 214), she saw the following Mapping window:



In this case Jane could see that the ten fields in the CSV file (shown in the **Copied from** column) corresponded exactly to the ten fields in her Music Matters database, so she clicked on **Merge**.

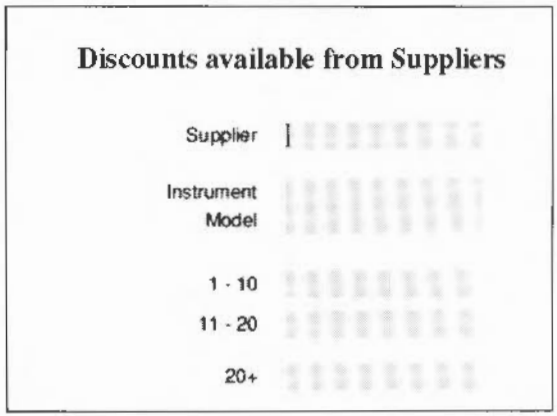
However, there are situations when there will be no exact correspondence between the CSV file and the database file, for instance:

- where the CSV file contains more fields than the database
- where the CSV file contains less fields than the database.

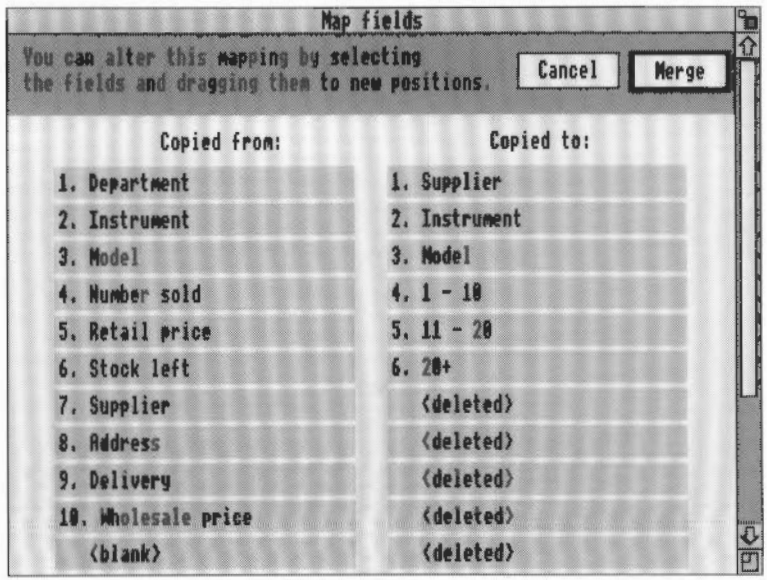
In these cases you must edit the Mapping window to ensure the correct fields in the CSV file are mapped to the equivalent fields in your database.

For example, Jane has created the layout of a database, `Discount` (this file is in the `DBtutorial` directory on Data disc A), that will contain information about discounts offered by suppliers. This layout contains three fields which will hold the name of the supplier, the type of instrument, and the model of that instrument. It has a further three fields which will hold details of the various discounts offered by that supplier. She knows that she can save time typing in the details for the first three fields by importing this information from the Music Matters database.

1 She goes into the `Discount` database. At this time it contains empty fields:



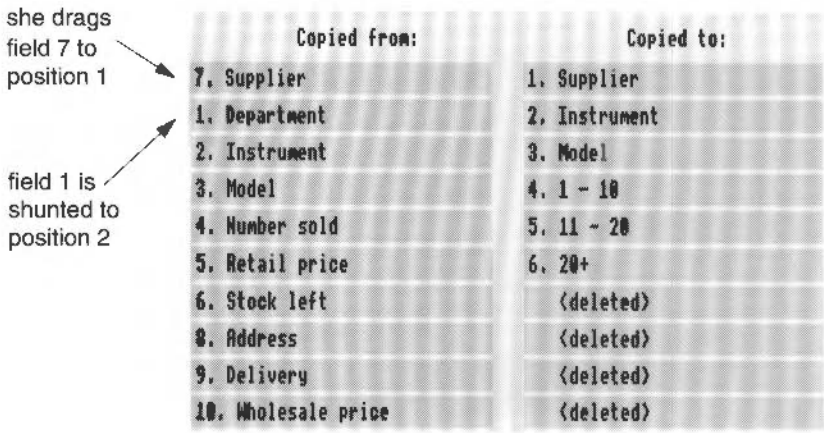
2 Next she drags the CSV file, `MusicData`, onto the toolbox in this window. The following Mapping window is then displayed:



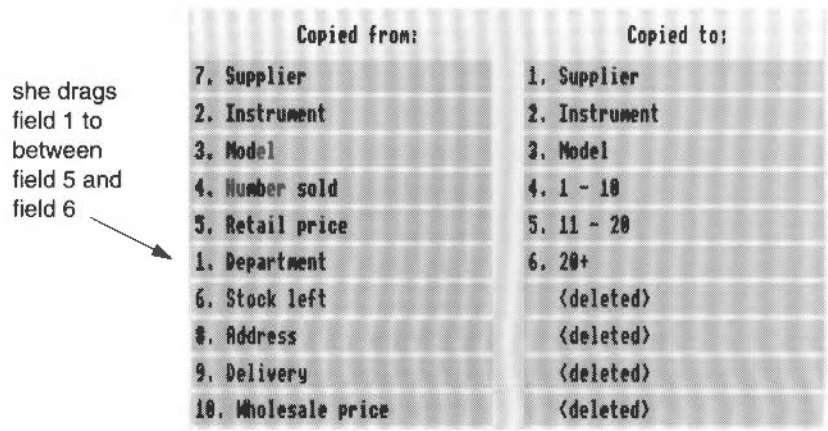
The three fields of interest to Jane are the Supplier, Instrument, and Model fields (fields 1, 2 and 3 in the **Copied to** column). These correspond to fields 7, 2 and 3 respectively in the Music Matters CSV file.

3 Jane can swap fields over on the Mapping window by dragging one onto another. To make the Mapping window do what she wants, Jane makes the following alterations in the **Copied from** column.

She drags field 7 (`Supplier`) to just above field 1 (`Department`). When she releases the Select button field 7 is displayed in position 1, and field 1 is automatically shunted down to position 2.



Next she drags field 1 (`Department`) between field 5 and field 6. Field 1 is then positioned between these two fields and fields 2, 3, 4 and 5 are shunted up by one position.

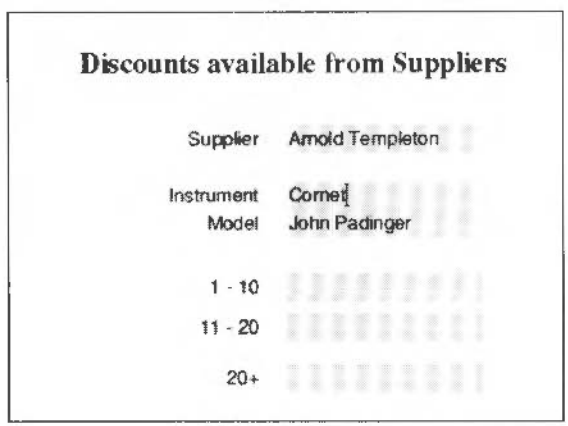


4 Jane now scrolls the window slightly so that three <blank> fields are visible beneath field 10 (Wholesale price). She highlights these three blank fields and drags them between field 3 and field 4. The three blank fields now follow field 3. Fields 2 and 3 are already in the correct position so they can be left unchanged.

The Mapping window now looks like this:

Copied from:	Copied to:
7. Supplier	1. Supplier
2. Instrument	2. Instrument
3. Model	3. Model
<blank>	4. 1 - 10
<blank>	5. 11 - 20
<blank>	6. 20+
4. Number sold	<deleted>
5. Retail price	<deleted>
1. Department	<deleted>
6. Stock left	<deleted>
8. Address	<deleted>
9. Delivery	<deleted>
10. Wholesale price	<deleted>

5 Jane now scrolls the window back up so that the **MERGE** button is visible and clicks on it. All of the records in the CSV file are copied into the new database. However, only data from three fields in the CSV file is written into the new database – from the Supplier, Instrument and Model fields (fields 7, 2 and 3). The three discount fields are left blank, ready to be filled in later:



The deleted box

An alternative way to map fields to each other is to use the <deleted> box in the **Copied to** column. For example, by dragging <deleted> boxes opposite those fields you do not wish to import, you can achieve exactly the same mapping as Jane did when she used <blank> boxes in the **Copied from** column:

Copied from:	Copied to:
1. Department	<deleted>
2. Instrument	2. Instrument
3. Model	3. Model
4. Number sold	<deleted>
5. Retail price	<deleted>
6. Stock left	<deleted>
7. Supplier	1. Supplier
8. Address	<deleted>
9. Delivery	<deleted>
10. Wholesale price	<deleted>
<blank>	4. 1 - 10
<blank>	5. 11 - 20
<blank>	6. 20+

Importing data from other Advance Database files

Importing data from one Advance database into another is identical to importing data from a CSV or TSV file, you simply drag one database onto the toolbox of a One Record window in another database. The same Mapping window will appear. For example, if Jane dragged `MusicDB` (not the CSV file `MusicData`) to her Suppliers discount database, she would see the following mapping:

Copied from:	Copied to:
1. Department	1. Supplier
2. Instrument	2. Instrument
3. Model	3. Model
4. Number sold	4. 1 -10
5. Retail price	5. 11 - 20
6. Stock left	6. 20+
7. Supplier	<deleted>

Creating a database to match a CSV or TSV file

There is no automatic way to create a database from a CSV or TSV file. If you have a CSV or TSV file of data, and you want to create a database to hold it, you must first create a database layout to receive the file of data.

A typical way to accomplish this would be as follows:

1 Make a list of all the fields in the file, noting which fields contain text, integers, real numbers, dates etc.

2 Open a new database. Create the same number of fields in the Layout editor as there are in the file, making sure that you give them appropriate field names and identical field types (e.g. if field 4 in the CSV file is an integer, then field 4 in the new database must be an integer field also).

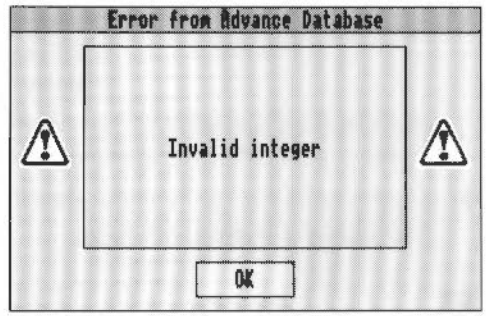
3 Save the layout and go into the One Record window.

4 Drag the CSV or TSV file onto the toolbox in your new database. When the Mapping window appears click on **MERGE**.

If the fields you created in the layout match the fields in the file, then your new database will be filled with data.

Error messages

If, when you click on Merge, the data in the file you are importing does not match your database layout you will see an Error box. For example, if you tried to import a real number into an integer field, you would see the following:



The import will be stopped at the last record in the file that contained a full set of correct fields.

Correcting errors

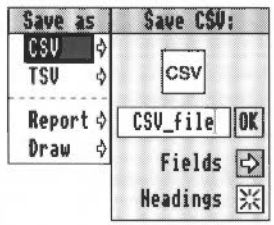
The simplest way to correct import errors is to check your data file thoroughly, and ensure that the contents of every field in it match the field types in your layout. It is usually best to begin by checking the line in the data file following the last line that was successfully imported.

Saving CSV and TSV files

You can save some or all of the data from a database into a CSV or TSV file. You can then drag this file onto the window of a spreadsheet or word processor file.

Any fields in a database, except graphic fields, can be saved as a CSV or TSV file. For example, to save fields in `MusicDB`, open the file and do the following:

1 Choose **File/Save as/CSV**. The Save CSV dialogue box will appear:



2 Move the pointer over the **Fields** button. The pointer will change into a small pointer and a small menu. Click Select and a list of fields will appear:

By default all the fields will be ticked. If you only want to save some of the fields in your database, click Adjust on the fields you do **not** want to save.

3 Come out of the Fields menu, type in a new filename if required, and drag the CSV file icon to your directory.

Headings

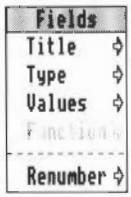
Normally when you save fields to a CSV or TSV file the titles of the fields will appear on the first line of the file. If you do not want these titles on the first line click on the **Headings** button to turn them off.

Importing a CSV or TSV file with no headings

To import a CSV or TSV file that does not have any titles on the first line, you must first turn off the Headings option in the Save CSV or Save TSV dialogue box. This instructs Advance Database not to expect titles on the first line of the file.

Editing fields in the Layout editor

Editing fields



Once a field has been created you can use the **Edit fields** submenu to change its title, data type, or specify a set of values that it can accept.

- **Title** leads to a box allowing you to enter a new title for that field.
- **Type** leads to a submenu which allows you to change the type of data a field can accept. The various data types are described in *Data types* on page 263.

  Note: If you use this option to change the data type of a field, and you have already inserted some data into the database, then when you come to save your edited Layout you will have to edit a Mapping window. This is because there will be a data conflict between the data you have already typed in, and the new data type you have specified for that field.
- **Values** leads to a box allowing you to enter a series of values that a field might contain.

  For example, if you highlighted the Department field in the Music Matters layout window, and typed the following into the **Values** dialogue box:

  Brass,Guitar,Keyboard,Percussion,Piano,String,Woodwind

  and then went to the One record window and clicked Select in the Department field, the following menu would appear:

  You could then click on one of the values, e.g. Guitar. That value would then be ticked in the menu and would overwrite whatever was currently displayed in the Department field.

  This option is ideal when you have a field into which you will insert one of a small number of values. It does not stop you from entering a value not in the values list.

  When a values list is displayed in a field you can remove it by pressing Esc, and re-display it by clicking in the field.
- **Function** allows you to define the action of a summary field in the Report Layout editor. It is described in *Summary fields* on page 246.
- **Renumber** leads to a box allowing you to change the order of that field. It is described in *Renumbering fields in the Layout editor* on page 263.

Deleting a field in the Layout editor

If you have created a field which you need to delete (perhaps because you pasted it incorrectly), highlight the field, and then choose **Edit/Delete**. The field will be deleted and all the fields that follow it will be shuffled down by one.

So, for example, if there are 10 fields and you delete Field 6, then

what was Field 7 will become Field 6,
what was Field 8 will become Field 7 and so on.

Copying fields in the Layout editor

Sometimes it is useful to make copies of a field you have already created, especially if you have edited the field to make it a certain size, colour and typeface. You can use the **Copy** and **Paste** options in the **Edit** submenu to duplicate a field:

1. Go to the toolbox and click on the Select mode button. Return to the Layout window, move the pointer over the field you want to copy and click Select.
2. Click Adjust on **Copy** in the **Edit** menu.
3. Now click Select on **Paste**. The menus will disappear and the cursor and field outline will be displayed. Move the cursor to wherever you wish to paste the field you have copied and click Select. An identical field will appear. You can continue pasting new copies as many times as required.

Fields that you paste will have the same field names, size, data type, colour and typeface as the field they were copied from.

Note: Instead of using **Copy** and **Paste** from the Edit menu you can use Ctrl-C for Copy and Ctrl-V for Paste.

Changing line spacing

Where a field can contain more than one line of text, you can adjust the spacing between the lines by highlighting the field, choosing **Effect/Line spacing**, and typing a new value into the Line spacing dialogue box.

For instance, when Jane created the Address field, she increased the depth of the field so that it could hold an entire address. Increasing or decreasing the line spacing value would give you the following effect:

13 Tavistock Way Wakefield Yorkshire	13 Tavistock Way Wakefield Yorkshire	13 Tavistock Way Wakefield Yorkshire
Line spacing = 13	Line spacing = 14.5	Line spacing = 16

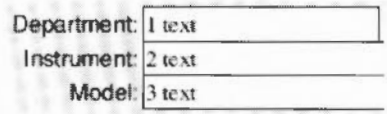
Renumbering fields in the Layout editor

If you want to change the order of fields you can use the **Renumber** option. For example, if you want to make the Retail price field follow the Model field:

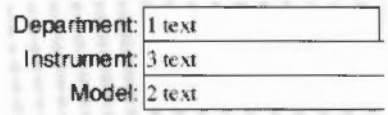
1 Highlight Field 3 (the Model field).

2 Go into the **Edit fields/Renumber** box, type 2 and press Return. The fields will be renumbered as follows:

Before renumbering



After renumbering



What was Field 3 will become Field 2, and what was Field 2 will become Field 3. Fields 4 onwards will be unaffected. Notice that the fields are not physically rearranged.

Note: If you try the above example you can return the fields to their original order by highlighting the Instrument field (which will now be Field 3), going into the Renumber box, and typing 2.

Highlighting all text and fields

A quick way to highlight all the fields and text on the layout is to press Ctrl-A (this is equivalent to choosing **Select all** in the Edit menu).

Data types

Each field you create in the Layout editor must be one of six data types. You can change the data type of a field using the data type buttons in the Layout toolbox, or by choosing them from the **Edit fields/Type** submenu.

- **Text** allows you to specify free-format text with word-wrap.
- **Boolean** allows you to create a Yes/No field. Clicking on this field in a record will toggle a tick (for yes) or a cross (for no) in the field. If you save your database as a CSV or TSV file, `Yes` or `No` will be written to the appropriate field position in the file depending on whether you ticked or crossed the box.
- **Integer** allows you to specify an integer.

- **Real** allows you to specify a floating point number. Trailing zeroes are automatically removed from real numbers. For example:

  34.00 will be displayed as 34

- **Date** allows only a date to be entered. There are a number of different formats in which dates can be entered:

Format	What you type in	What it becomes
Day, Month, Year	26 2 1991	26th Feb 1991
	26 Feb 91	26th Feb 1991
	26th February 1991	26th Feb 1991
Month, Year	2 1991	Feb 1991
	Feb 1991	Feb 1991
Day, Month	4 2	4th Feb
	4 Feb	4th Feb
	4th February	4th Feb
Year	91	1991
	91 AD	91 AD
	191	191
Month	February	Feb
	Feb	Feb
Day	2nd	2nd

  - Advance Database will always convert a cardinal number for the day of the month (e.g. 22 Feb, 3 Feb) into an ordinal number (e.g. 22nd Feb, 3rd Feb).
  - When displaying a month name, Advance Database will always display the standard three letter abbreviation for that month.
  - You can add AD or BC after the year. This is essential where you want to specify a year before 100 AD.

- **Graphic** allows you to drag a Draw file or Sprite file to the field.

  When you drag a Draw file or a Sprite file to a graphic field the aspect ratio of the picture is not changed. The picture is displayed in the centre of the field, filling as much of the field as possible, without being stretched horizontally or vertically. You should note that if you include large and detailed Draw files reduced to tiny sizes, your document may fail to print.

  Note: Once you have dragged a Sprite file or Draw file to a Graphic field, changing the original Sprite file or Draw file will **not** change the picture displayed in the Graphic field. If you change the original Sprite file or Draw file, and you want this new picture to replace the picture in the Graphic field, you must drag the changed file to the Graphic field. The new picture will then replace the old one.

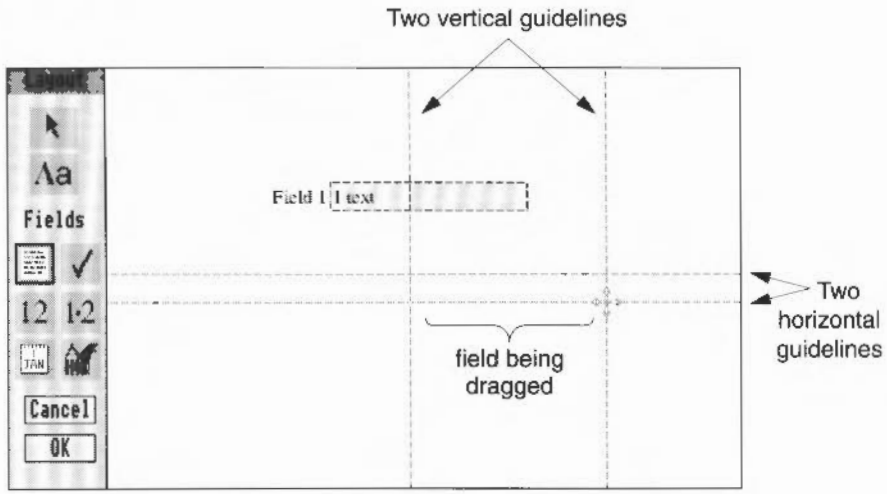
Aligning fields

The **Utilities/Snap to frames** option allows you to align one field with another field. With this option switched on, any field you drag will snap to the edge of the nearest field to it on the layout.

- A right-aligned field will snap to the right edge of the nearest field
- A left-aligned field will snap to the left edge of the nearest field
- The top edge of any field will snap to the top edge of the nearest field
- If you drag the handle of a highlighted field it will snap to the right edge of the nearest field.

Guidelines

When you create a layout, it is sometimes useful to display guidelines to help line up fields and text. To display guidelines choose **Utilities/Guidelines**. When this option is switched on, four lines radiate from the field or piece of text being dragged. These lines help to show the field's position relative to other fields:



Saving default values in the Layout editor

When you create a new layout (or edit an existing one) you can save the effects that you select (from the Effect submenu) by choosing **Utilities/Save as default**. Thereafter, every time you create a new database, the Layout editor will be opened with the same effects that were in force when you saved them.

You can use **Save as default** to create a new set of defaults whenever you want.

Editing records

Copying records

It is often useful to copy all the data from one record into a new record. This is especially useful when you want to create several very similar records, and you don't want to re-type identical data into each one.

To duplicate a record:

1 Go to the record you wish to duplicate.

2 Type Ctrl-R or click Adjust on the **Add** button in the Toolbox.

A new record will be displayed containing the same data as the original record. You **must** edit this new record in order to save it.

Copying and pasting text

If there is some text in a field box that you wish to copy into another field box (either on the same record or another record):

1 Select the text you want to copy by highlighting it. Click on **Copy** in the Edit menu. The text you highlighted will be copied to the clipboard.

To copy the text from the clipboard into another field:

2 Move the pointer to the required position in another field box and click Select. Then click on **Paste** in the Edit menu. The text from the clipboard will now be pasted to wherever the caret is.

Deleting text

Select the text you want to delete by highlighting it and then click on **Cut** in the Edit menu. The text will be deleted but will also be copied to the clipboard; this gives you the option to paste the deleted text back to its original position or to a new position on a different record.

Note: If you click on **Delete** instead of **Cut**, the text will be deleted but will **not** be copied to the clipboard.

Select all

To select the entire contents of a field for copying or deleting, click inside the field and then choose **Edit/Select all**. The entire field will be highlighted, even if it stretches over several lines (as in the address field in `MusicDB`).

Clear

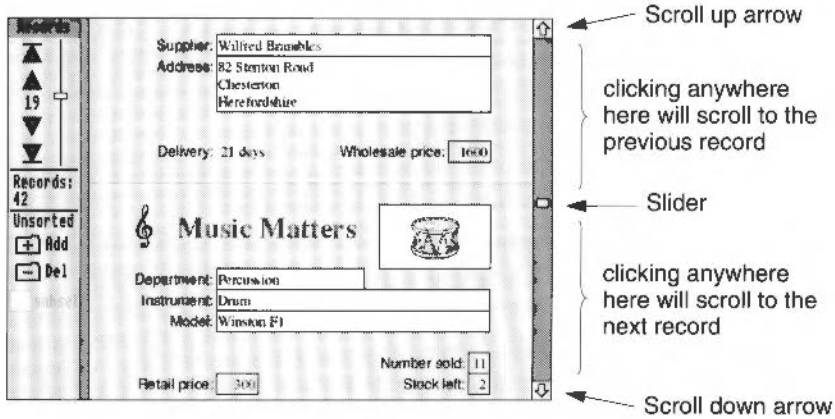
To deselect any text that is highlighted, click on **Clear** in the Edit menu.

The All records window

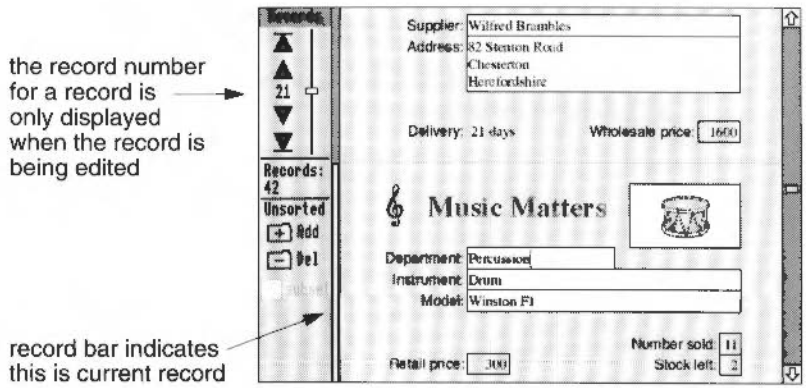
This is a special editing window which allows you to scroll through the records in a database and edit them. To go to this window choose **View/All records**.

To scroll through records in this window you can

- click on the scroll up or scroll down arrow
- drag the slider up or down the scroll bar
- click just above or just below the slider on the bar
- press Page Up or Shift-↑ to go back one record, and Page Down or Shift-↓ to go forward one record.

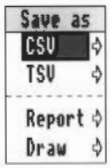


Using the scroll bar does not change the record number in the toolbox. When you begin to edit a record the number of that record is displayed in the toolbox, and a record bar appears next to the record to indicate that it is the current record.



Saving data in different formats

The **Save** option in the File menu leads to a Save box allowing you to save the database into either the file you created when you first quitted the Layout Editor, or into a new file of your own choosing.



The **Save as** option in the File menu allows you to save your database in any of four formats:

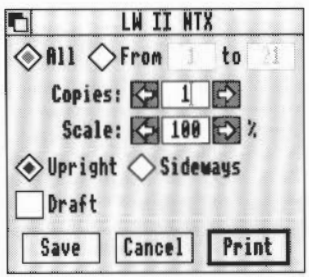
- **CSV** leads to a Save box allowing you to save the database as a file of Comma Separated Values, where the data for each field is separated by a comma. You can then read and edit this file using Edit. Only textual fields are saved, graphic fields are ignored. So if you saved the Music Matters database as a CSV file, only the first 10 fields would be saved.

  CSV files are very useful if you want to export your data to other database packages. For more information about saving CSV files, and exporting them to Advance Spreadsheet or Advance Word Processor, see *Saving* CSV *and* TSV *files* on page 260.
- **TSV** leads to a Save box allowing you to save the database as a file of Tab separated values. Only textual fields are saved, graphic fields are ignored.
- **Report** allows you to save the records as a simple text file. Pictures and colours are not stored, and all text is saved in one standard font and font size. The text is laid out in the same format as it appears on the records.
- **Draw** allows you to save the record (or the current page of a report) you are working on as a Draw file. All parts of the record are saved, including colours and graphic fields.

Printing

Before you try and print any records, make sure that you have a suitable printer correctly connected and set up, and that you have loaded the !Printers application onto the icon bar (see the RISC OS 3 *User Guide* for details).

To display the Print dialogue box choose **File/Print** or press the Print key. The following box will be displayed:



To print one or more records do the following:

1. Select whether you want to print all the records, or a range of records.
2. Specify how many copies you want.
3. If you want to print the record smaller or larger, specify a new scale.
4. Select whether you want to print the record upright or sideways.
5. By default the complete record will be printed, including pictures, exactly as it appears on your screen. If you want to print just the text click on **Draft**.
6. Click on **Print**.

Print options

All – if selected, all records in the database will be printed.

From ... **to** – if selected, the range of records in the adjacent boxes will be printed.

> **Note**: Print will analyse the printed size of a record to determine how many it can fit on one sheet of paper in the printer. If it can fit two or more records on a sheet then it will amend the range given in the **to** box. So, for instance, if you wanted to print a range of records from the `MusicDB` database, the range displayed would be from 1 to 21, even though there are 42 records. This is because Print decides it can fit two records on one sheet of paper. If you were to reduce the scale of the record, even more records could be fitted onto one sheet of paper.

Copies – determines how many copies of each record will be printed.

Scale – affects how large the printed record will appear when it is printed. 100% is full size. The left and right arrows next to the scaling field allow the scale to be increased or decreased in steps of 1%.

Upright or **sideways** – controls whether records are printed upright or sideways.

Draft – if selected, prints just the text parts of the records using 12pt text and Corpus font.

> **Note**: Because **Draft** prints only 12pt Corpus characters, you may find that field boxes containing more than one line of text appear to have incorrect horizontal alignment. Although this does not affect the appearance of records within your database, you may prefer to avoid it by designing your database layout using 12pt Corpus.

Save – saves the settings in the Print box.

Cancel – quits out of the Print dialogue box without printing.

Print – click on this to print your record.

Altering record sizes

The Print dialogue box of Advance Database has a writable Scale icon. As well as allowing you to alter the magnification of printed documents, it also controls the area available for you to place fields on each database record.

If you are laying out a database, and finding it difficult to find room for all the fields you want on each record, you can follow this procedure:

1 Choose **View/One record**.

2 Choose **File/Print...**.

3 In the Print dialogue box, alter the **Scale:** icon to read less than 100%, e.g. 50%.

4 Click on **Save** to confirm the setting.

When you now edit your database layout, you will have more room available to arrange your fields on each record.

Note that if you set the Scale to greater than 100%, when you next choose **Edit layout** the record space is reduced, and you may not be able to see all your fields. To correct this, perform steps 1 to 4 above, but set **Scale:** to 100% at step 3.

Summing up

In this chapter you've learnt how to use Advance Database to sort and search records, import data from CSV files, create graphs and produce reports.

In the next chapter you will learn how to use the Graph tool to produce both simple and complex graphs.

12 Introducing the Graph tool

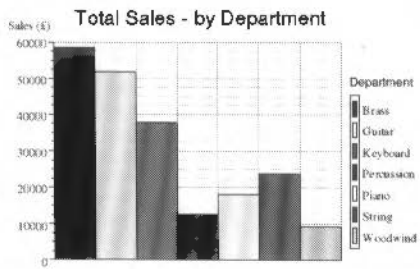
Advance Graph allows you to convert data from the Spreadsheet and Database into clear, informative pictures.

Types of graph

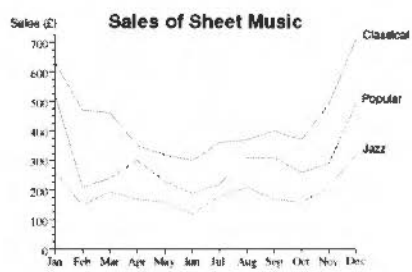
Any data in a spreadsheet or database tells a 'story'. Often the quickest and easiest way to see that story is to display it as a graph. How well the story is conveyed to the observer depends on the type of graph used, and the way that the graph is presented. The Graph tool provides four different types of graph.

Examples of graph types

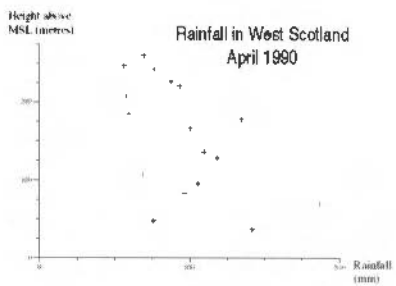
The following are examples of the four different types of graph.



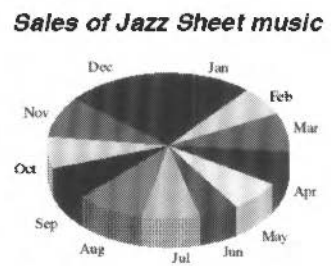
Bar chart



Line graph



Scatter graph

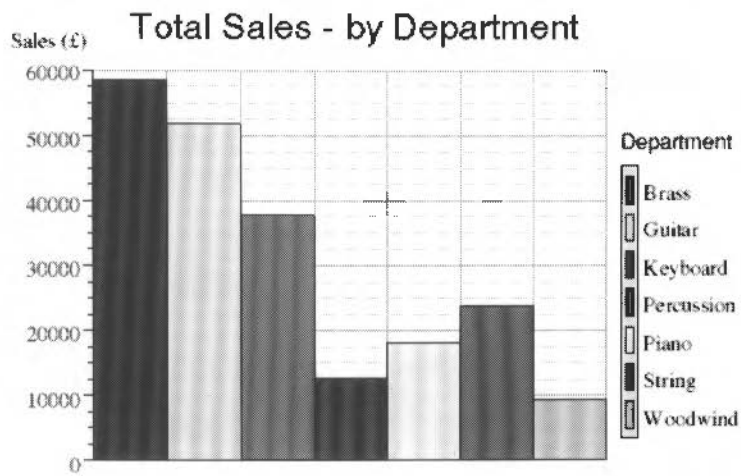


Pie chart

What makes up a typical graph

The bar chart below shows some of the basic components that make up a graph:

title	'Total Sales – by Department'
axis labels	'10000, 20000, 30000, 40000, 50000, 6000'
axis titles	'Sales (£)'
key	'Brass Guitar Keyboard Percussion Piano String Woodwind'



Options

The Graph tool also provides a series of options that allow you to

- select special types of graph, such as exploded pie charts or stacked bar charts
- change the size of a graph and the scaling of the axes
- display graphs in 2-D, 3-D or outline
- overlay graphs on top of each other
- add text to any part of a graph
- display graphs on top of a grid
- save graphs as Draw files.

For a full description of all the graph types, and the sort of data you might plot using them, see *Selecting the right graph* on page 281.

13 The Graph tool

The Advance Graph tool allows you to create simple or complex graphs, and then change their appearance by displaying them in 3D, overlaying them on top of each other, drawing them over a grid and adding text.

In the first part of this chapter Jane McCluskey, the manager of Music Matters, creates a simple graph and then modifies and improves that graph. The second part of this chapter describes in more detail the different graph types available, and the options that can be used to control their appearance.

You can create a graph in one of two ways:

- by opening a Database or Spreadsheet file and then going to the Graph tool
- by opening the Graph tool and then dragging a Graph data file or CSV file to it.

When you go to the Graph window from the Database or Spreadsheet, you automatically take your plotting data with you.

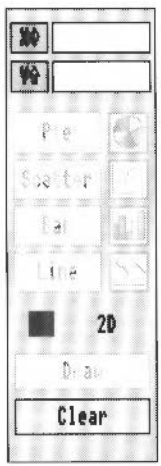
- Creating graphs from the Spreadsheet is described in *Displaying results as a graph* on page 114, and in *More on graphs* on page 189.
- Creating simple graphs from the Database is described in *Creating graphs* on page 249.

Note: Once you are in the Graph window, you use the same facilities to edit graphs regardless of whether you imported your plotting data from a Graph data file or CSV file, or brought it to the window via the Database or Spreadsheet.

Creating a simple graph

It's the end of the financial year and Jane McCluskey decides that she would like to see how sales of sheet music have performed. This information is not kept in the main Music Matters database, but in a second database called `SheetMusic` (this file is also in the `GRtutorial` directory on Data disc A). In particular she wants to see how sales of Classical sheet music have fluctuated throughout the year.

She opens the `SheetMusic` database and then presses F7 to go to the Graph window. To the left side of this window is the Graph toolbox. This allows you to specify the data you wish to plot, and the type of graph to use to plot that data.

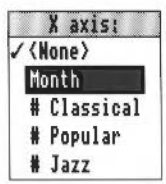


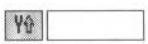
Button	action
X data	displays a menu of data you can plot on the X-axis
Y data	displays a menu of data you can plot on the Y-axis
Pie	selects a pie chart
Scatter	selects a scatter graph
Bar	selects a bar chart
Line	selects a line graph
2D	selects 2D, 3D, or outline
Draw	draws the graph in the graph area
Clear	deletes the graph in the graph area, and clears the data in the X and Y buttons

Jane now specifies the data she wishes to plot on the horizontal and vertical axes (the X-axis and Y-axis).

1 She moves the pointer over the **X data** button at the top left of the window. The pointer changes into a small pointer attached to a tiny menu:

2 She clicks Menu and a list of all the fields in the database is displayed. She clicks on **Month**. The name of the database field is displayed in the box next to the **X data** button (the # indicates that the field contains a number).





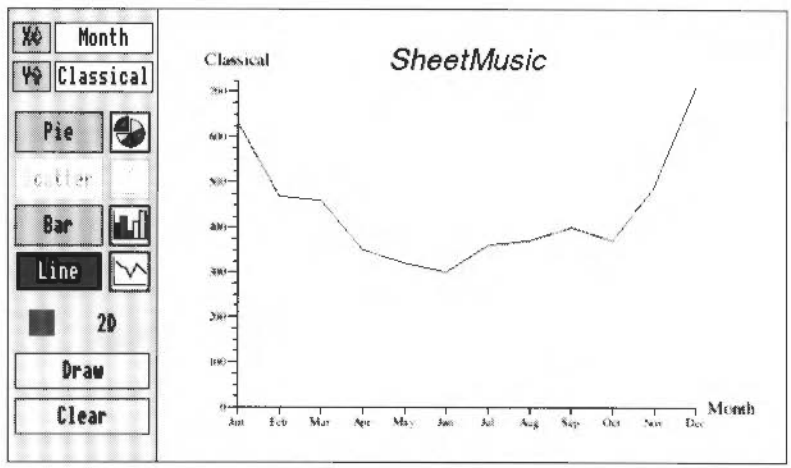
3 Next she clicks Menu over the **Y data** button. The same list appears and this time she clicks on **Classical** (this field contains the monthly sales figures for Classical sheet music).

4 The Graph tool analyses the data that Jane has specified and highlights three of the four graph buttons to show that she can plot her data using these graph types. She clicks on the **Line** button.

5 Jane does not want a key to appear in this graph, so she goes into the **Graph/Options** submenu, and makes sure that the **Key** option is not ticked.

Draw

6 Finally she clicks on **Draw**. The line graph is then displayed:



Making a graph 3D

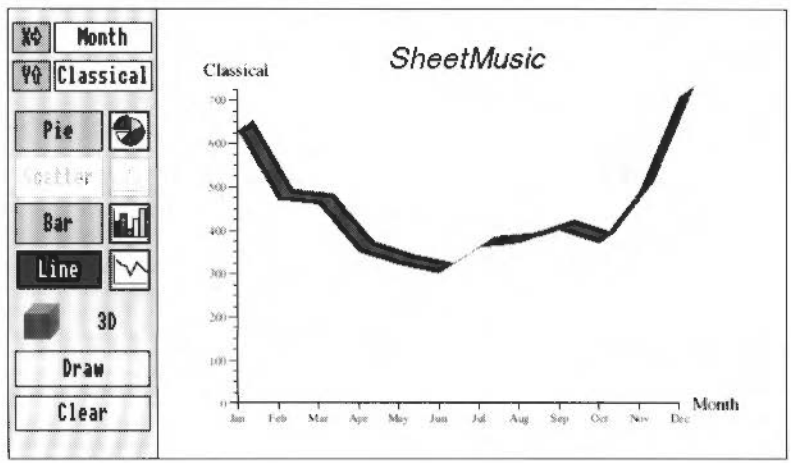
Jane now wants to see what the graph would look like drawn in 3D.

2D

1 She moves to the **2D** button. As she clicks on this button it cycles around three options: 2D, 3D, and outline. She selects 3D.

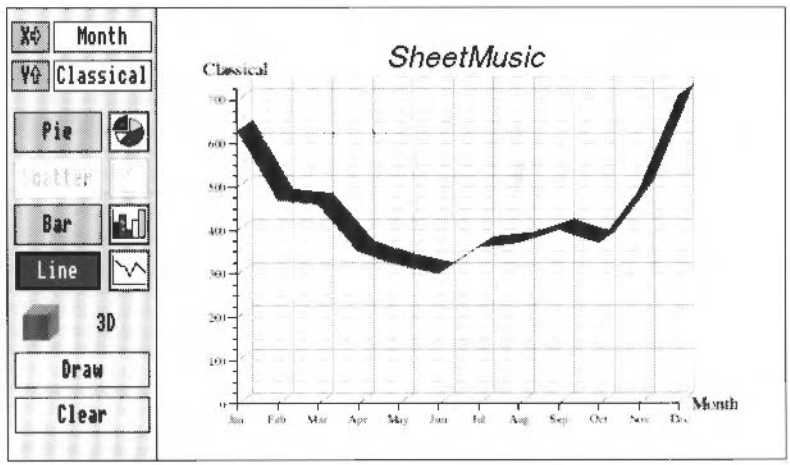
2D 3D Outline

2 She then clicks on **Draw** and the graph is redrawn in 3D.



Adding a grid

Displaying a graph on top of a grid is very useful if you want to know whether a particular point on the graph is above or below a certain value. To display a grid on her graph, Jane presses F10. She then clicks on the **Draw** button to redraw the line graph.



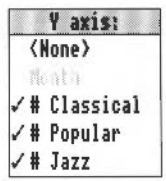
Drawing multiple graphs

Overlaying one graph on top of another allows you to compare

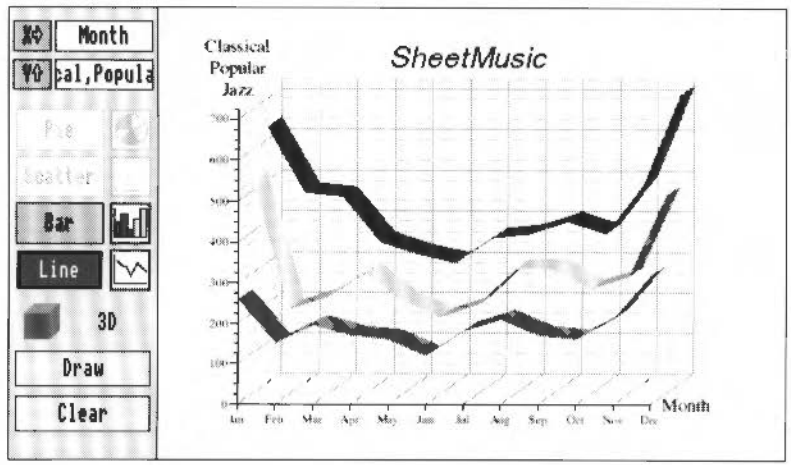
- the relative performance of two or more sets of data against each other
- the difference in trends (such as seasonal variation) between the data.

Jane wants to look at all three sets of sales figures, so that she can assess how they are performing relative to each other.

1 She clicks Menu over the **Y data** button. The same list of fields appears as before, with a tick next to Classical. This time she clicks Adjust on Popular and Jazz. All three fields are now ticked.

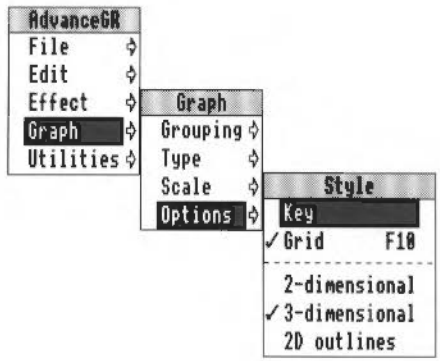


2 She clicks on **Draw** and the graph is redrawn:



Adding a key

Jane looks at the graph and realises that she does not know which line refers to which set of sales figures. So she moves into the drawing area, and chooses **Graph/Options/Key**.

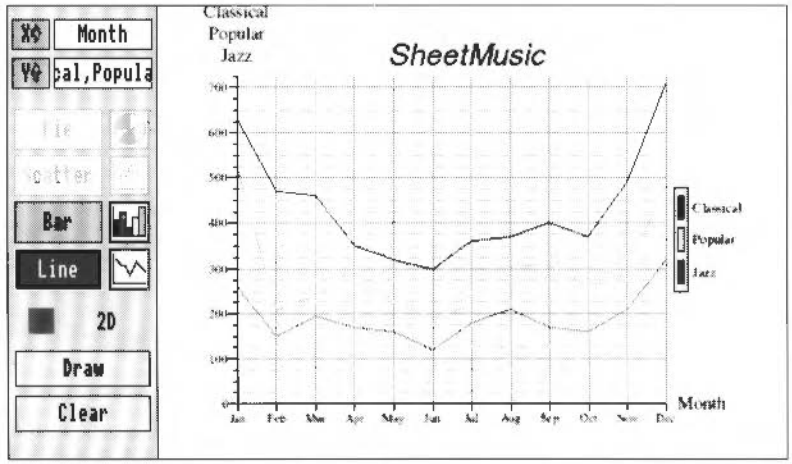


Selecting 2D

She also decides to select 2D lines instead of 3D lines, so that it's easier to read.

2D She clicks on the **2D** button until it says 2D.

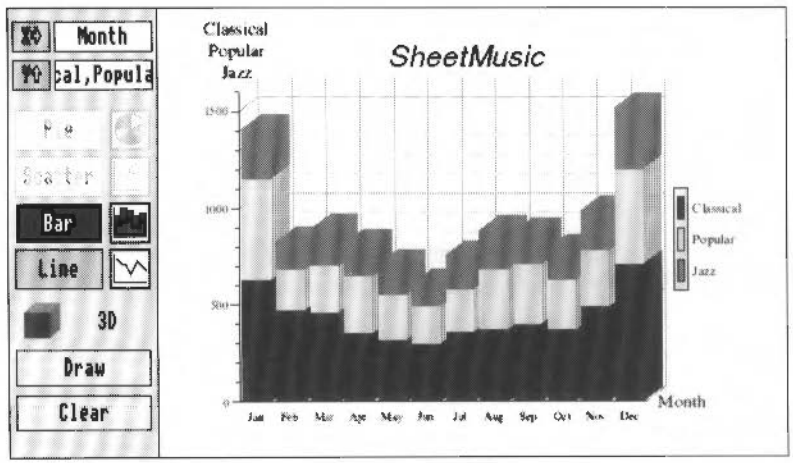
Finally she clicks on **Draw**.



The key is a big improvement, and 2D lines make it easier to read the exact value of each point. As soon as she looks at the three lines, she can see that classical sheet music sales far exceed the sales of popular and jazz sheet music, and that the sales of all three types of sheet music increase rapidly in the Christmas period.

Changing the graph type

The next thing Jane wants to produce is a graph showing not only how well each type of sheet music is selling, but also how well combined sales of all three types of sheet music are selling each month. Stacked bar charts are ideal for this, so she clicks 3D back on again, and then clicks on the Bar type button until it shows stacked bar charts. Finally she clicks on **Draw**.



Editing text on a graph

Jane is almost ready to print the graph, but first she wants to edit the graph to make it more informative and readable.

Changing the title

By default the Graph tool uses the filename of the database or spreadsheet file as a title for the graph. To change the title Jane does the following:

1. She moves the pointer over the title, `SheetMusic`, and double clicks Select. A caret appears in the text and she changes the title to `Sales of Sheet Music - 1992`.
2. She then moves the pointer away from the title to a blank part of the graph and clicks Select once. The pointer changes back to an arrow.
3. She moves the pointer back over the title. It changes to a hand. She now clicks Select once. A rectangle appears around the text. She then chooses **Effect/Bold**.

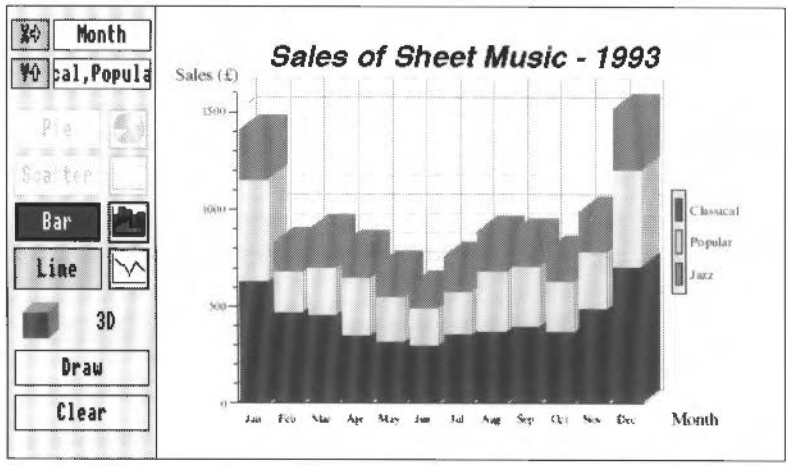
Changing the axis titles

When drawing a multiple graph, the Y axis title is a combination of all the fields that have been selected, so on this graph the Y axis title is displayed as `Classical Popular Jazz` on three separate lines. This looks confusing, so Jane decides to change the Y axis title to something shorter and more informative.

1. She double clicks Select over the axis title. A caret appears inside the text and she changes the text to `Sales (£)`.
2. The new title is now too far above the Y axis, so she moves the pointer away from the new title to a blank part of the graph and clicks Select once. The pointer changes back to an arrow. She moves the pointer back over the axis title, clicks Select, and drags it back to it's original position at the top of the Y axis.
3. Finally she highlights the X axis title, `Month`, and drags it down so that it is level with the X axis labels.

Note: Changes to text are not saved if you draw a new graph. So only change text when you are satisfied with the rest of the graph.

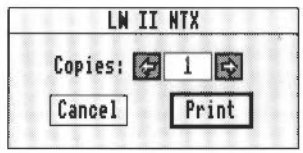
Her graph now looks like this:



For a full description of how to edit text and objects (such as the key) on a graph see *Editing a graph* on page 292.

Printing a graph

Jane now wants to print the graph she has created. Before she tries this she makes sure that she has a printer correctly connected and set up, and that the !Printers application is loaded onto the icon bar. She then presses the Print button on the keyboard. When the Print dialogue box appears she clicks on **Print**:



When the graph is drawn on the printer it fills an entire A4 sheet of paper.

Quitting the Graph tool

Jane now wants to quit the Graph tool and return to her database, so she clicks on the close icon in the top left corner of the graph window. A dialogue box appears allowing her to save her graph as a file, or quit the Graph tool without saving her graph. She clicks on **Discard** to quit the Graph tool without saving her graph.

For a full description of saving a graph as a Graph data file, and then using this file to re-create the graph, see the section entitled *Saving a graph* on page 295.

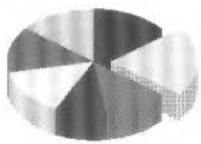
Selecting the right graph

When you draw a graph you want it to present data in the most informative and visually interesting way possible. This means

- choosing the best type of graph to display your data
- deciding whether the graph should be drawn in 2-D, 3-D, or outline.

What type of graph is best?

The following table is a summary of the different graph types you can use:



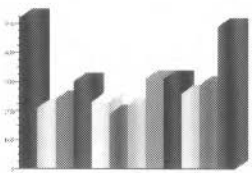
Pie charts

show a total broken down into its individual parts

Examples:

Showing the share of votes each party has in an election

Showing the share of a market different organisations have



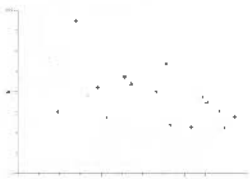
Bar charts

show differences between separate sets of data

Examples:

Comparing the sales performances of different products

Comparing the number of eggs laid by different chickens



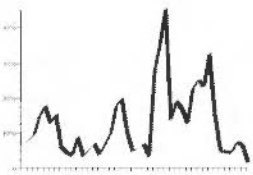
Scatter graphs

show the distribution of data

Examples:

Showing the distribution of population in different age groups

Showing the amount of rainfall in an area by land height



Line charts

show trends in data

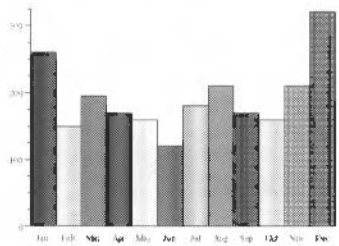
Examples:

Showing the sale of ice cream over 12 months

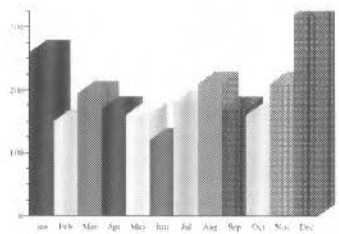
Showing the change in temperature of the polar ice caps

Should the graph be 2-D, 3-D, or in outline?

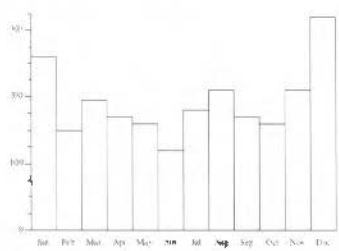
If you open the `SheetMusic` database and go to the Graphs window, and then select Month in the **X data** field and Jazz in the **Y data** field, you can display the data as a 2D, 3D, or Outline graph. If you selected Bar charts as the type of graph, the same data could be plotted in any of three ways:



2-D the normal way of displaying a graph

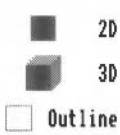


3-D displays the same graph in 3-D



Outline displays the same graph in outline, with no shading

Selecting 2-D, 3-D or outline



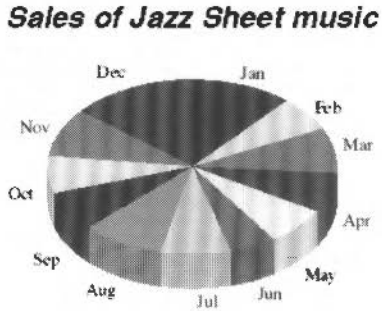
To display a graph in one of these three ways, click on the **2D** button. As you click on it, the button will cycle around three options: 2D, 3D, and outline; at the same time the icon to the left of the button will change to reflect the mode. When the button shows the option you want, don't click any more. You can then click on **Draw** to display your graph.

Outline graphs are sometimes clearer than 2D or 3D graphs when drawn on a dot matrix printer. They also allow you to colour the graph in yourself.

Which of these three ways of displaying a graph you choose is a matter of personal choice.

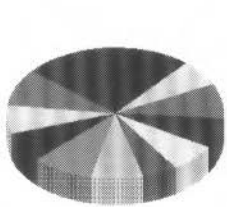
Pie Charts

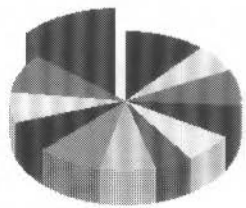
Pie charts are ideal for showing the breakdown of a total into its individual parts, and they do this by showing the total as a pie and then showing how big a slice of that pie each of the components have. So, in the example below, the whole pie represents the total sales of Jazz sheet music sold by Music Matters over a 12 month period, and the individual slices show the amount sold each month as a percentage of that total:

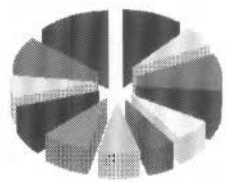


Types of pie charts

To select a particular type of pie chart click on the **Pie type** button. As you click on it, the button will cycle around the three types available, and the pie chart displayed on the button will change to show that particular type. When the button shows the type you want, don't click any more.







 Whole

 One section out

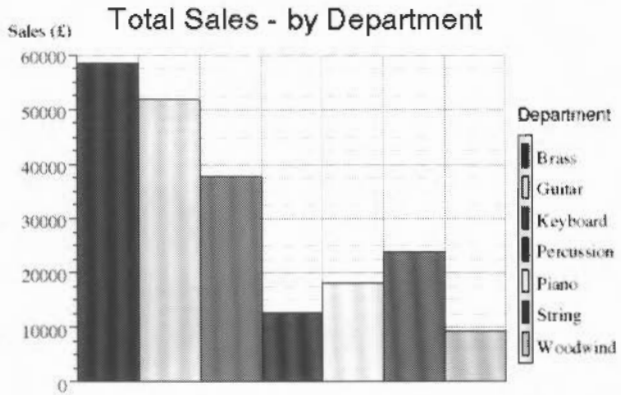
 All sections out

Whole	whole pie charts show the relative values of a set of categories.
All sections out	used as an alternative to whole pie charts.
One section out	pie charts with one segment exploded are used to highlight the segment containing the largest value (or the first segment if all the segments have the same value).

Remember that pie charts do not provide a means of absolute measurement – bar charts or line graphs are better for this.

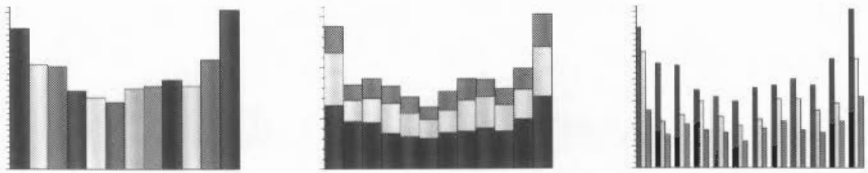
Bar charts

Bar charts are ideal for showing differences between separate sets of data. So, in the example below, the individual performance of each department in Music Matters, in terms of total sales, can be clearly and easily compared:



Types of bar chart

To select a particular type of bar chart click on the **Bar type** button. If you are plotting a single set of data, only the normal type is available. If you are plotting more than one set of data, the button toggles between stacked and clustered. The tiny bar chart displayed on the button changes to show the type currently selected.



 Normal

 Stacked

 Clustered

Normal each bar represents a value in a certain category.

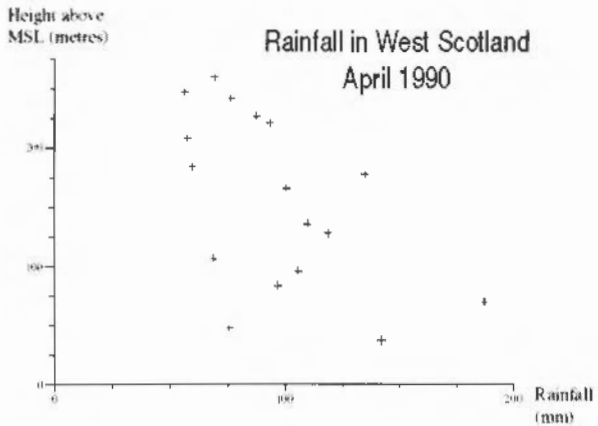
Stacked each column represents 100 percent. The bars in each column make up that 100 percent.

Clustered sets of bars are used to show multiple data.

Stacked and clustered bar charts both use shaded bars to represent different sets of data. To tell you what the shaded bars refer to, you should always include a key when you draw a stacked or clustered bar chart.

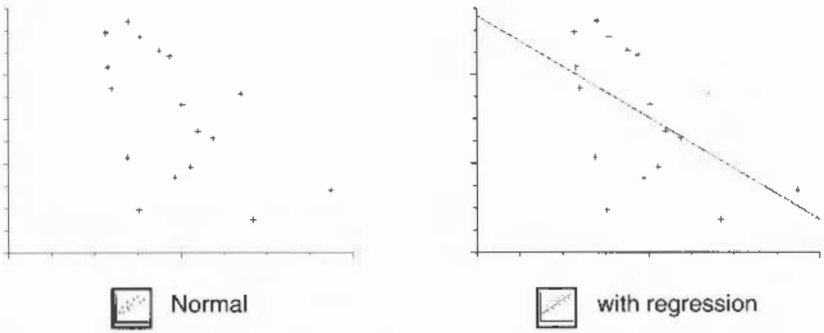
Scatter graphs

Scatter graphs are used to display relationships between two (or more) sets of related data. In the example below, the amount of rainfall at seventeen weather stations in West Scotland has been plotted against the height of those weather stations.



Types of scatter graph

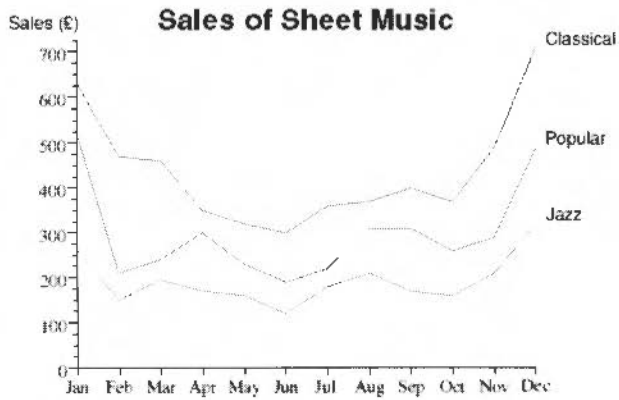
To select a particular type of scatter graph click on the **Scatter type** button. As you click on it, the button will cycle around the two types available, and the scatter graph displayed on the button will change to show that particular type. When the button shows the type you want, don't click any more.



Normal	draws one marker for each set of data points
with regression	draws a best fit line through all the markers

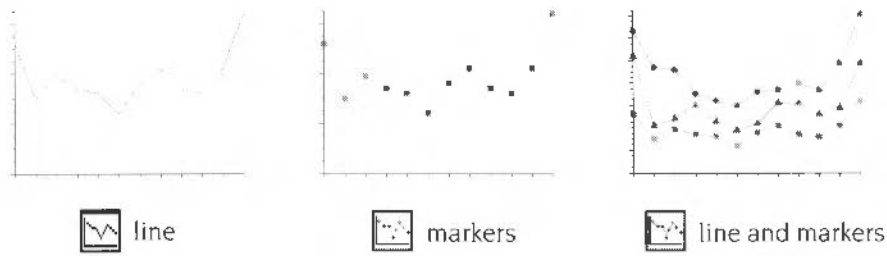
Line graphs

Line graphs are used to show trends, usually over a period of time. So, in the example below, it is clear that sales of all three types of music sheet generally improve around Christmas, but sales of Classical music sheets do not perform very well in March and April compared to Popular and Jazz sheet music:



Types of line graph

To select a particular type of line graph click on the **Line type** button. As you click on it, the button will cycle around the three types available, and the line graph displayed on the button will change to show that particular type. When the button shows the type you want, don't click any more.



line	displays a line connecting each value
markers	displays a marker for each value but does not draw a line
line and markers	displays a line connecting each value and a marker for each value

Grouping

You can use grouping to display how many records in a database fall into a series of ranges.

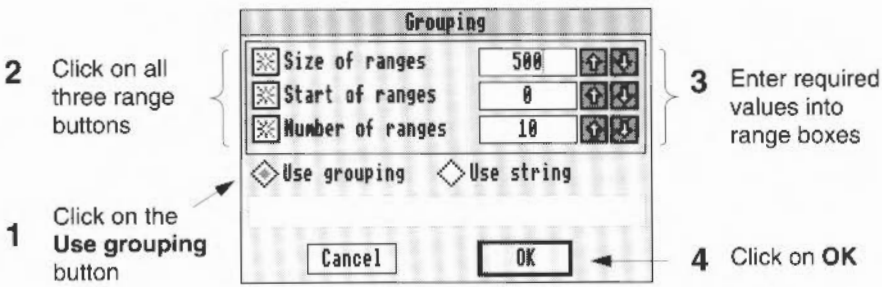
For example, if you want to show how many instruments in the Music Matters database fall into a series of retail price ranges, you would do the following:

1 Open `MusicDB` and sort the records into ascending order using the Retail price field.

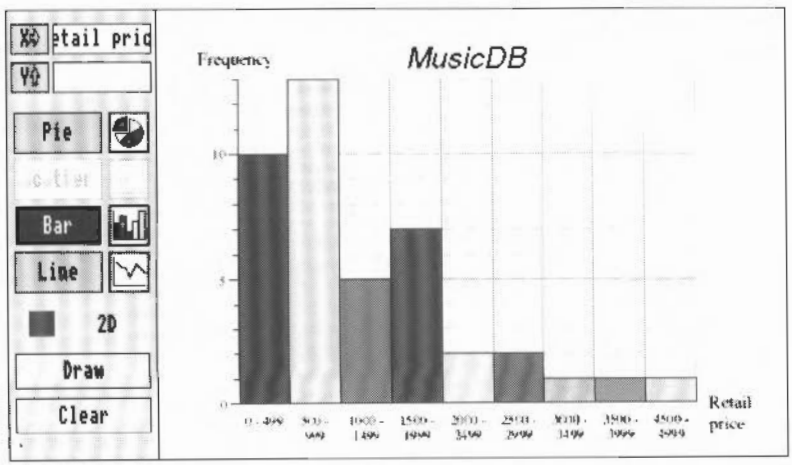
2 Go to the Graph window and select **Retail price** on the X axis.

3 Select Bar chart, and press F10 to display a grid.

4 Choose **Graph/Grouping**. The Grouping dialogue box will appear. Click on the **Use grouping** button. Now click on the three buttons above this button. Then enter 500 in the **Size of ranges** box, 0 in the **Start of ranges** box, and 10 in the **Number of ranges** box. Finally click on **OK**.



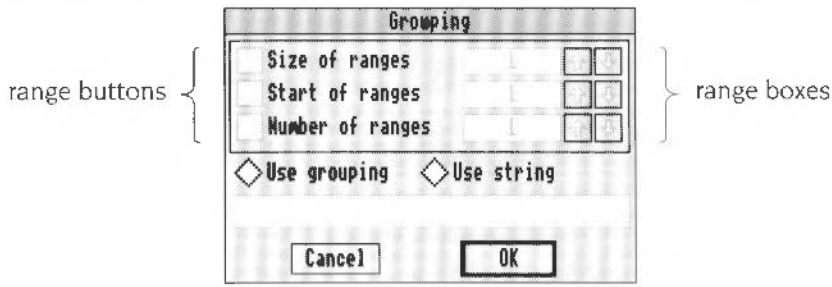
5 Click on **Draw**. A bar chart will be displayed showing the number of instruments in the database within each retail price range.



You can also display the same data as a line graph or a pie chart.

The Grouping box

When you first go into the **Graph/Grouping** dialogue box all the range buttons and range boxes are greyed out to show that they are currently unavailable:



If you click on **Use grouping**, the range buttons and range boxes become available.

The range boxes work as follows:

Size of ranges — *specifies how wide a range is*

If the values in a field vary between 1 and 4500, and you enter 500, then each range will cover 500 units.

Start of ranges — *specifies the start of the first range*

If you enter 1, and Size of ranges is 500, then the ranges would be: 1 – 500, 501 – 1000 etc.

If you enter 0, and Size of ranges is 500, then the ranges would be: 0 – 499, 500 – 999 etc.

Number of ranges — *specifies the maximum number of ranges that will be displayed*

If you specify too many ranges, only the number of ranges that are required by the data are displayed.

If you specify too few ranges, then the last range will extend itself to include the highest value.

If there are no values in the database for a particular range, that range will not be displayed.

Note: If you enter a value for Start of range that is greater than one or more values in the database, the first range will extend itself to include all the lower values.

The Use string option

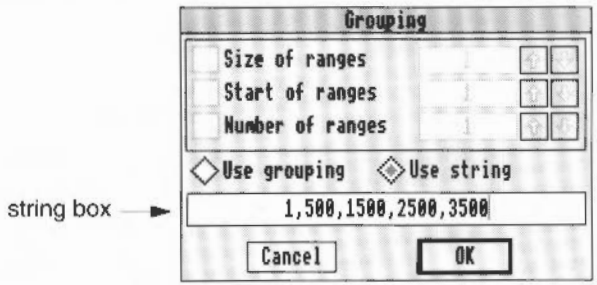
The Use string option gives you flexibility over the ranges you want to display. In particular it allows you to specify ranges of different sizes.

For example, to display the ranges:

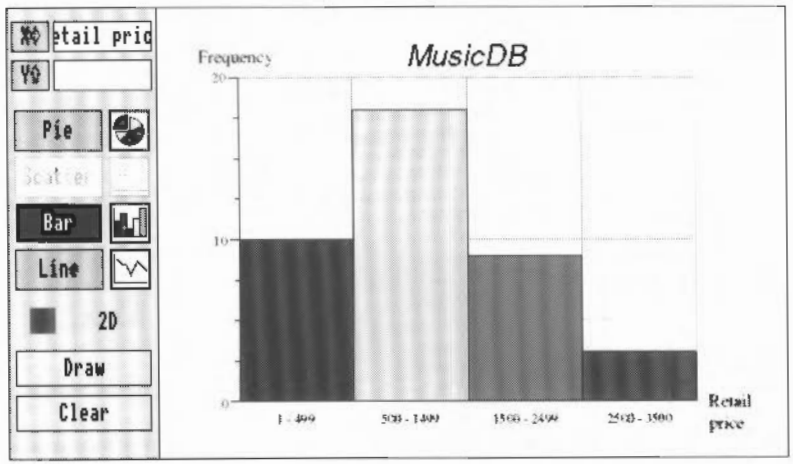
1 – 499 500 – 1499 1500 – 2499 2500 – 3500

1 Click on **Use string**.

2 Type 1,500,1500,2500,3500 into the string box, then click on **OK**:



3 Finally click on **Draw**. The following graph would be displayed.



Although entering a string in this way allows you to specify ranges of different size, those ranges must follow each other. To display ranges that are **not** continuous you can specify ranges using 'to'. For example, to display the ranges:

1 – 499 1500 – 2499 2500 – 3500

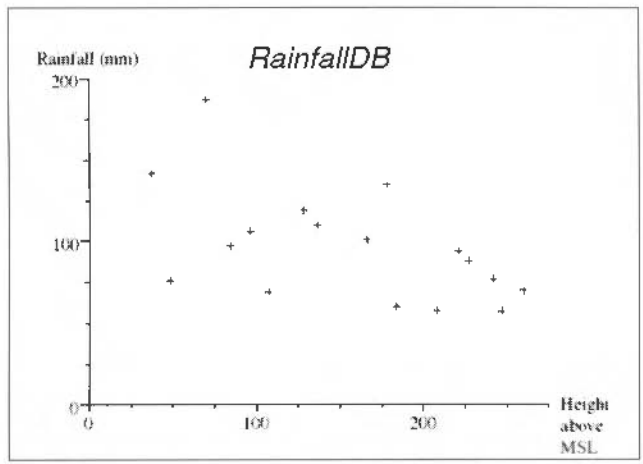
you would type the following into the string box:

```
1 to 499, 1500 to 2499, 2500 to 3500
```

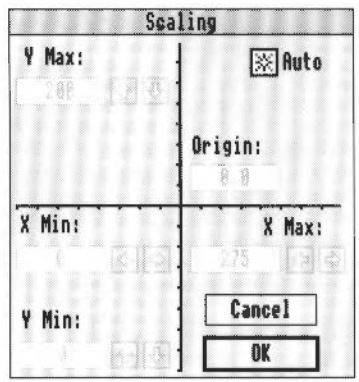
Changing the axis scaling

When you draw a graph the axes are scaled automatically. On scatter, bar and line graphs you can adjust the origin or axes manually.

The database file `RainfallDB` in the `GRtutorial` directory on Data disc A contains data for rainfall at seventeen weather stations in West Scotland. If you draw a scatter graph from this file, plotting rainfall on the Y axis and height above Mean Sea Level (MSL) on the X axis, it would be displayed as follows:



To plot this same graph with the origin, X axis, or Y axis scaling changed, choose **Graph/Scale**. The following Scaling box will appear:



1 Click on the **Auto** button to turn automatic scaling off.

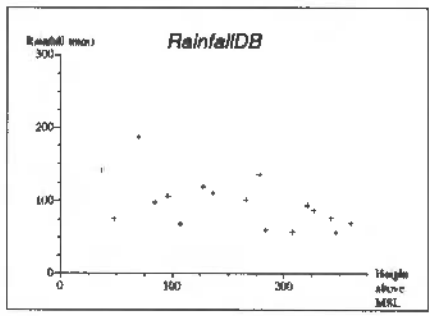
2 Enter new values into the **Y max**, **Y min**, **X max**, **X min** or **Origin** boxes.

3 Click on **OK**. The scaling box will disappear.

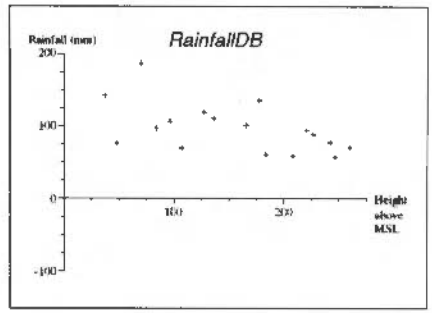
4 Click on **Draw** to redraw your graph.

Here are some examples of different values:

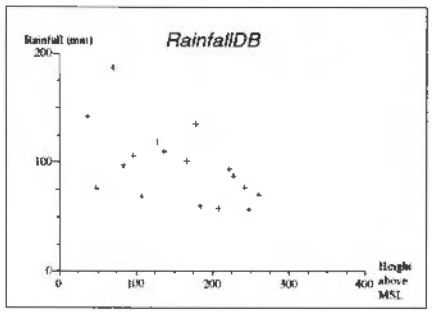
Y max changed to 300



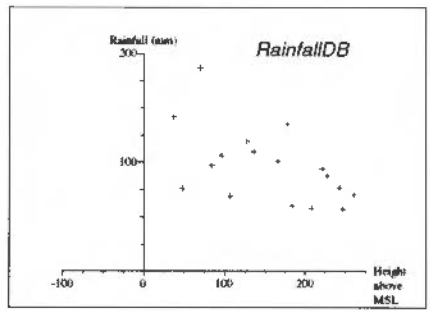
Y min changed to –100



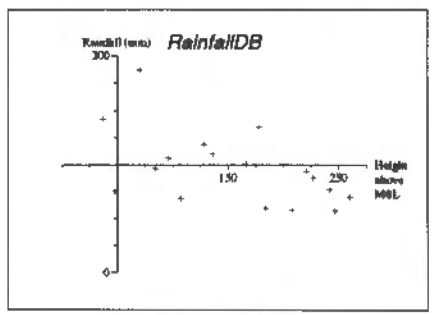
X max changed to 400



X min changed to –100



Origin changed to 50,100



Editing a graph

The graph area is composed of three main elements: the graph (which includes the axes and the grid), the key and text (which includes the axis labels and the key legends). These elements can be edited in various ways:

- the graph can be moved, copied, or deleted
- the key can be moved, copied, or deleted
- all text can be changed, moved, deleted, re-sized or coloured.

In addition, new text can be inserted anywhere in the graph area.

Note: all editing changes are lost if a graph is re-drawn. If you want to save your graph, including any edits you have made, save it as a Draw file.

Editing text

After a graph has been drawn you can change the characteristics of the text on that graph as follows:

1 Move the pointer over the text to be changed, the pointer will change to a hand. Highlight the text by clicking Select once.

2 Go into the **Effect** submenu.

3 Click on the required option (e.g. **Italic** or **Bold** if you want to italicise or embolden the text, **Text font**, **Text size**, or **Text colour** to change the font, size, or colour of the text).

Altering existing text

To edit existing text, for example, changing the word `SheetMusic` to `Sales of Sheet music`, do the following:

1 Move the pointer over the text. The pointer changes to a hand.

2 Click Select twice. The pointer appears inside the text as a caret.

3 Change the text as required.

Restoring the pointer

You will now be in Text mode. Even when you move away from the text you have edited, the pointer will still be a caret. To restore the normal pointer, move the caret away from the text and the graph and then click Select once.

Adding new text

To add new text to the graph, for example, inserting the words 'Classical', 'Popular' and 'Jazz' next to the three lines in the example on page 293, do the following:

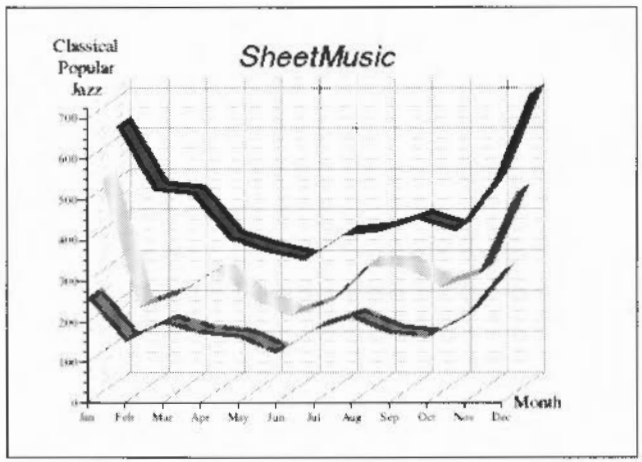
1 Move the pointer to the approximate position you want to insert some new text and double-click Select.

2 A caret will appear and you can type in your text.

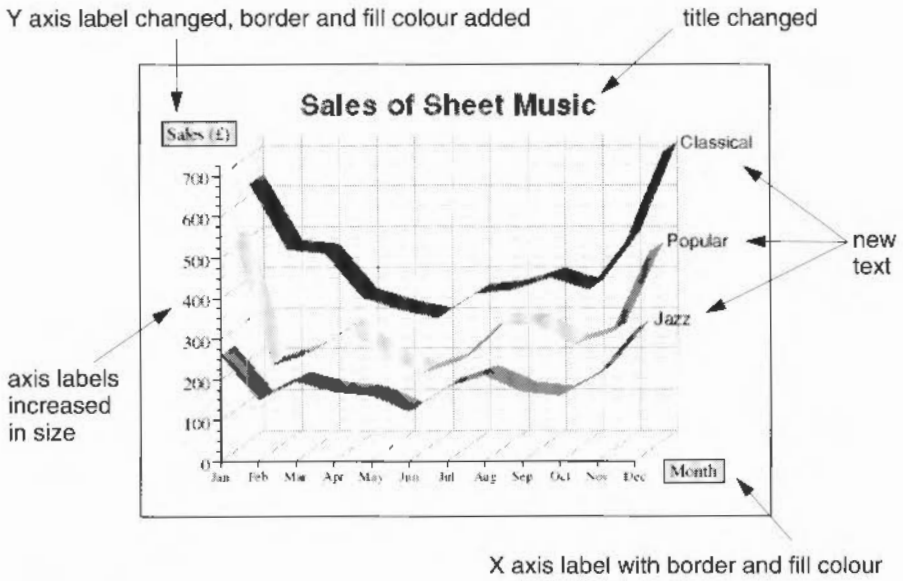
After you have finished typing in your text move the pointer away and click Select once. This will restore the normal pointer.

For example:

Before editing



After editing



Moving the graph

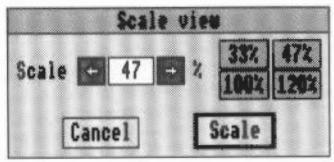
The graph (including the axes and grid) can be highlighted separately and dragged to a new position.

The key, key legends and axis labels can also be highlighted and dragged to a new position.

Changing the size of a graph

It is easier to position new text on a graph if you zoom into the area to be edited. For instance, to zoom into the graph shown in *Editing text* on page 292:

1 Press F11 to display the **Scale view** dialogue box:

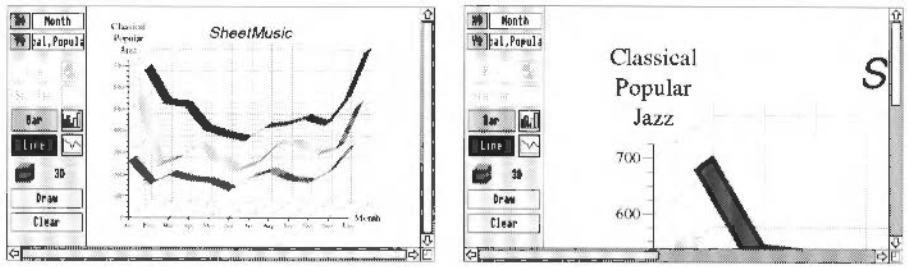


This box shows that the current scale is 47%.

2 Click on the pre-set scale button that says 120% to increase the scale factor.

3 Then click on **Scale**. The contents of the display area are now zoomed in from 47% to 120%:

Default scale (47%) Scale increased to 120%

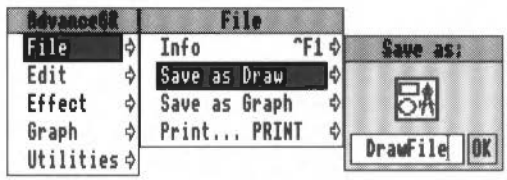


To return to the normal scale go back into the **Scale view** dialogue box and click on the pre-set scale button that says 47%. Then click on **Scale**.

Saving a graph

As a Draw file

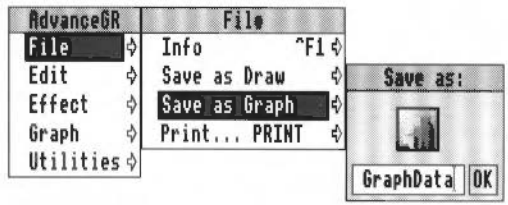
You can save a graph as a Draw file by going into the **File/Save as Draw** dialogue box, typing in a new filename (unless you want the file to be called `DrawFile`), and then dragging the **Save as** icon to a directory:



The Draw file will save everything displayed inside the graph area, including any new text you have inserted.

As a Graph data file

You can save your graph as a Graph data file (that can then be used to re-create your graph) by going into the **File/Save as Graph** dialogue box, typing in a new filename (unless you want the file to be called `GraphData`), and then dragging the **Save as** icon to a directory.



Re-creating a graph from a Graph data file

A Graph data file contains all the information required to re-create a graph. Once you have saved a graph as a Graph data file you can re-create it by double-clicking on the Graph data file icon, or opening the Graph tool and dragging the Graph data file to the Graph window.

You can then re-draw the same graph by clicking on **Draw**.

Note:

The Graph data file saves information such as whether you specified a key, grid, or a new scale, and also any effects (text size, fill colour etc) that you applied to the title, axis titles, and axis labelling.

It does **not** save any new text you have added to the graph, changes to text that you may have made, nor grouping data.

Printing a graph

Printing from Draw

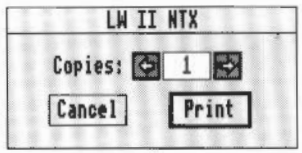
You can print a graph by saving it as a Draw file and printing it from Draw.

Printing from the Graph tool

To print a graph directly from the Graph tool:

1. Make sure that a suitable printer is correctly connected and set up, and that the !Printers application is loaded onto the icon bar (the RISC OS 3 *User Guide* describes this).
2. Create a graph in the Graph window.

3 Press the Print button on the keyboard to display the Print dialogue box:



4 Type in the number of copies you want and click on **Print**.

The graph area in the Graph window represents a horizontal (sideways) piece of A4 paper, so when the graph is drawn on the printer it fills an entire A4 sheet of paper.

Quitting the Graph tool

To quit the Graph tool click on the close icon in the top left corner of the graph window. A dialogue box will appear with the following three choices:

Discard closes the window without saving the current graph

Cancel removes the dialogue box and leaves you in the Graph window

Save allows you to save your current graph as a Graph data file

Unless you wanted to save your current graph as a Graph data file you would normally click on **Discard**.

Saving default values in the Graph tool

If you change the axis title or axis labels using the Effect menu, you can save these effects for any future graphs you draw by choosing **Utilities/Save as default**. Thereafter, every time you display a graph, the axis title and axis labels will be displayed with the same effects that were in force when you saved them.

Appendix A: Moving data between Advance tools

Memory permitting (see *Data transfer on machines with limited memory* on page 302) you can move data in most directions between the four Advance tools – Word Processor, Spreadsheet, Database and Graph, as well import and export data to and from other applications.

This can be done in two ways:

- Cutting or copying and pasting between tools.
- Dragging files of compatible types into tool windows.

Cutting or copying and pasting between tools

You can cut or copy and paste data between different Advance tools in much the same way as you can inside the same tool, assuming your computer has sufficient memory to have two tools active at the same time. Data here means plain text, although there are some exceptions, such as the ability to cut and paste graphics from the Database to the Word Processor. Effects are mostly or completely lost during cut and paste operations.

You must make sure that the destination window has the input focus (you have clicked in it, and the title bar has turned yellow) before you paste in the data.

The procedure may be summarised as follows:

1. Select the text (or cells) to be cut or copied.
2. Cut or copy it to the clipboard.
3. Place the cursor (or select a cell) in the destination window.
4. Paste in the data.

Note the following details of cut and paste operations within Advance:

- Spreadsheet data is pasted into the Word Processor as a TSV file (i.e. rows generate newlines, columns go to tabs).
- When pasting data from the Word Processor into the Spreadsheet, include newlines to change row, and tabs to change column.
- When pasting data from the Word Processor and Spreadsheet into the Database in browse mode, if the caret is not inside a record, CSV- and TSV-type data will be pasted into fields in a record.

Dragging files of compatible types into tool windows

Compatible RISC OS file types

In common with much RISC OS software, Advance tools can import data from compatible RISC OS file types, such as

- Draw files
- Sprite files
- Edit files.

The *Data transfer diagram* on page 301 shows which RISC OS file types individual tools can import.

You import such RISC OS files into an Advance document by placing the cursor at the position required in the target document, then dragging the RISC OS file icon into the target document.

Importing (and exporting) standard file formats

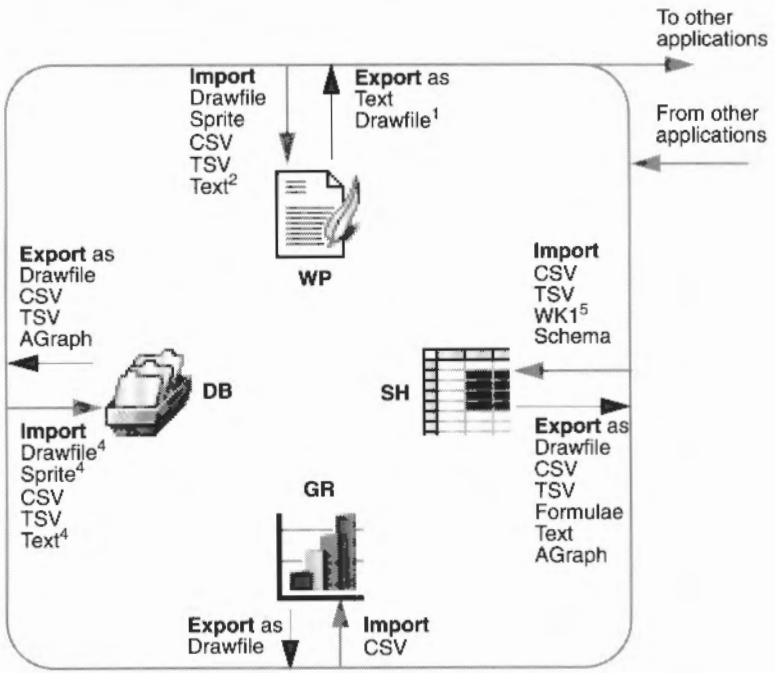
Work carried out in an Advance tool is usually saved in that tool's native file format, and such a file can only be interpreted subsequently by the same tool. However, data can be exported by tools in other standard formats which may be acceptable to another Advance tool and to other applications altogether. Such formats are:

- CSV (Comma Separated Value)
- Plain (ASCII) text
- TSV (Tab Separated Value) – plain text with tabs.

These formats can also often be generated by other applications and imported by Advance tools. See the *Data transfer diagram* on page 301 for details of which tools can import and export which of these formats.

Data transfer diagram

This diagram shows how data may be transferred between Advance tools and to and from other applications, using compatible file formats. Tools can also, of course, save files in their own native format:



[1] Illustrations only
[2] Including Document Description Format (DDF)
[3] To a Text field
[4] To a Graphic field
[5] Lotus 1-2-3 file format

Data transfer on machines with limited memory

On machines with limited memory, it is not always possible to run more than one Advance tool at once. This restricts the transfer of data by cutting and pasting between two open tools. Accordingly, in such cases you must transfer data using the alternative method described in *Dragging files of compatible types into tool windows* on page 300:

1. save the data in a file type compatible with the destination tool
2. quit the tool
3. choose **Minimise memory** from the Advance icon bar menu
4. display the destination tool window
5. drag the file into the destination window.

Appendix B: Using Advance on 1MB or 2MB computers

This appendix contains hints and tips for making the best use of Advance on a computer with 1MB or 2MB of RAM. If you have a 2MB computer, you'll probably only need to read *Swapping between Advance tools*.

Swapping between Advance tools

Advance has a modular structure, made up from the following tools:

- AdvanceWP (Word Processor)
- AdvanceSH (Spreadsheet)
- AdvanceDB (Database)
- AdvanceGR (Graph)

When you create a new Advance document, or double-click on an existing Advance document in a directory display, the corresponding tool is loaded automatically into the computer's memory (if it isn't loaded already). It then remains loaded in memory until you quit Advance or choose the **Minimise memory** option.

On a computer with 4MB or more, you can load any or all of the tools at once. On a 1MB computer there is only room for one Advance tool to be loaded at a time. On a 2MB computer, any two can be loaded at once (providing other RISC OS applications aren't taking up too much memory).

If you try to load an Advance tool when there's not enough memory available, you'll see a message like this:

```
Application needs at least 384K to start up
```

This means you'll need to quit the Advance tool you're currently using to make room to load another. For example, if you're using the Word Processor, and want to use the Spreadsheet next:

1. Save any Word Processor documents you're working on and close their windows.
2. Click Menu on the Advance icon on the icon bar.
3. Choose **Minimise memory**. This will remove the Word Processor application from memory.

4 Create a blank Spreadsheet document, or double-click on a particular Spreadsheet file you want to open.

An alternative is to save all your files, reset your machine, then reload Advance – see *Resetting the computer* below.

Producing graphs on a 1MB computer

On a 1MB computer, you can't draw a graph **directly** from the Database or Spreadsheet (by choosing **Utilities/Graphs** or pressing F7) as this requires two tools to be loaded at once.

Producing graphs from the Database

To plot a graph from Advance Database on a 1MB machine:

1 Save the data that you want to plot as a CSV file.

2 Save any Database documents and close their windows.

3 Click Menu on the Advance icon on the icon bar.

4 Choose **Minimise memory**.

5 Choose **Create/Graph** (this opens a blank Graph document).

6 Drag the CSV file's icon over the Graph window, and then plot the graph as you would normally.

Producing graphs from the Spreadsheet

To plot a graph from Advance Spreadsheet on a 1MB machine:

1 Select the data you want to plot and choose **Utilities/Graph type/Plot rows** or **Plot Columns** (see *Sending row or column data to the Graph tool* on page 115).

2 Choose **Save as/Graph** and drag the `GraphData` icon to an open directory display. This saves the data from the Spreadsheet in AGraph format, which the Graph tool can understand.

3 Save any Spreadsheet documents and close their windows.

4 Click Menu on the Advance icon on the icon bar.

5 Choose **Minimise memory**.

6 Choose **Create/Graph** (this opens a blank Graph document).

7 Drag the GraphData file's icon over the Graph window, and then plot the graph as you would normally.

Resetting the computer

Some tools such as AdvanceWP need **relocatable modules** (software extensions to the operating system) to be loaded. When you remove such an application from the icon bar, it may leave some or all of these modules behind, since they may be needed by another tool. However, when you are very short of space, this behaviour – normally helpful – may mean that you don't have enough space for the next tool.

It's therefore a good idea to reset the computer before loading Advance. Before doing this, make sure you save any work you have done, as it will be lost from the computer's memory when you reset.

To reset the computer, press Ctrl-Break or Ctrl-Reset. Then load Advance.

If at any stage you find that there's not enough memory to finish a task while you're using Advance, try saving your work, then resetting as above before reloading Advance.

Resetting without running a boot file

If you have a 1MB computer with a hard disc containing a boot file that starts some applications each time you switch on, carry out the reset by holding both Ctrl and Shift while pressing Reset; this will prevent the boot sequence from being executed.

Choice of screen mode

The appendix entitled *Screen modes* in your RISC OS 3 *User Guide* lists the screen modes that are available on RISC OS computers. The table there shows the memory used by each screen mode. If you are very short of memory, you should use mode 12 for a colour display (even if you have a multi-frequency scanning rate monitor). If you are happy with a monochrome display, you can save even more memory by using mode 0, 8 or 11 on a standard-resolution monitor or mode 19 on a multi-frequency scanning rate monitor.

Opening directory displays

When you open a display for a directory containing applications, the computer runs the boot file for each application. This loads the applications' sprite files, which then occupy some of the computer's memory. For example, if you have a hard disc and you keep a lot of applications in a single directory, their sprites might take up as much as 30K. If you are very short of memory, you cannot afford to waste this space and you should therefore not open directories containing applications

you do not want to use. The chapter entitled *Installing and running Advance* on page 7 shows you how to install in a directory containing just the Advance icons (and !Scrap on a floppy disc).

If you hold down Ctrl when opening a directory by double-clicking, the sprites used by any applications are not loaded into the sprite pool; this also saves memory.

Printing

If you don't intend to do any printing during your session, don't load !Printers at all. If you do intend to print, since Advance enables you to print by selecting a menu option (rather than by dragging a file to the printer driver icon), you can save some space by first loading !Printers and then removing it again by choosing **Quit** from the icon bar menu. This leaves behind the printer driver module, which is all you actually need in order to print from Advance. You will of course need to do this after resetting the computer.

If you are using Edit, you must have the full Printer manager application loaded for Edit to print correctly. Edit will not print with only the printer module loaded.

For non-PostScript printers, the printing process also requires memory to use as a buffer space; the more that is available for this, the faster printing will be. You can increase the free space by temporarily switching to mode 0 while you print.

Finally, note that on non-PostScript printers, printing in landscape format uses more memory than printing in portrait format.

Optimising memory usage

Use the Task manager to display the computer's current memory usage. You can change any of the red bars to release as much memory as possible for applications. Candidates for reduction include:

- Module area

  While using Advance, free space in the Module area can build up, so occasionally it may be worth displaying the Task manager window and reducing this.

- Font cache

  Set this as a compromise between window redraw speed and space occupied; if redrawing the screen takes a long time, you have made the font cache too small.

- System sprites

  This can be reduced to zero for Advance.

SetIcons application

SetIcons can use up a significant amount of free memory, up to 60KB. If you need this extra memory for running applications, do not use SetIcons.

Using a RAM disc

If you are using a 1MB computer, use either no RAM disc or only allocate a very small amount of space to it while using Advance.

Installing more memory

Perhaps the easiest way to get the best out of your computer is to fit additional memory (RAM). Most RISC OS computers can be expanded beyond 1MB. With 2MB or more, memory constraints are rarely a problem and you won't need to use most of the memory-saving measures above.

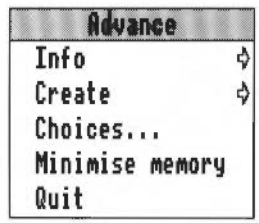
Appendix C: Configuring menu options

You may wish to restrict the functionality of your copy of Advance, in order to make it easier for others to learn, perhaps, or to impose a house style on Advance documents. You can do this by configuring the menu options, so that a more limited set is available.

Advance menu options are configured by editing the menu file for each tool. We tell you how to do this below.

Configuring the Advance icon bar menu

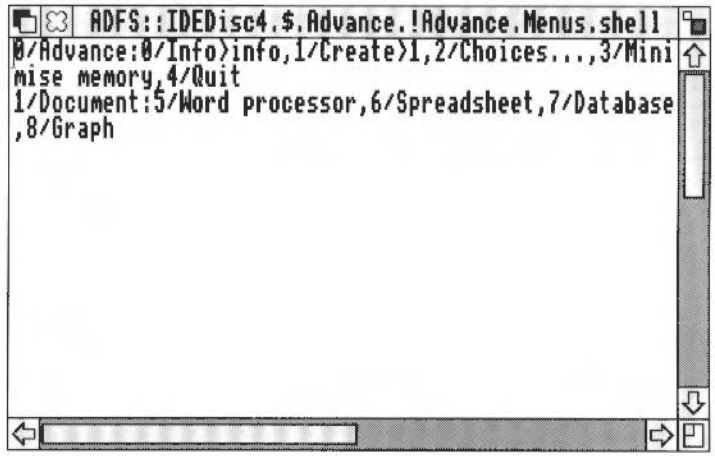
You can determine which of the Advance menu options appear when you click menu over the Advance icon bar icon:



To do this, follow these steps:

1. Shift-double-click on the !Advance application icon; the contents of the Advance application directory will be displayed, including a `menus` directory.
2. Open this directory, and you will see menu text file icons for four of the Advance tools. You will be changing the `shell` file.
3. Just in case something goes wrong, make a copy of the `shell` file, giving it a different name, such as `oldshell`. This way you can restore the original set-up in future by discarding the new, edited `shell` file you are going to create, and renaming `oldshell` as `shell`.

4 Double-click on the `shell` file icon, and the following text file will be displayed:



5 To remove a menu option, type a # character in front of the name of the menu option to be deleted.

6 To confirm the change, save the text file. Quit Advance if it is loaded, then load it again. Click Menu on the icon bar icon, and the changed menu structure will be displayed.

The Advance tool which is loaded when you click on the Advance icon bar icon (by default, Advance Word Processor), will always be the first one in the **Create** sub-menu. So, if you remove `Word processor` from the sub-menu, Advance Spreadsheet will be loaded when you click on the icon, as it is now at the top of the list.

Configuring Advance Word Processor menus

To remove options from Advance Word Processor menus, you need to change the Word Processor's menu file:

1 Shift-double-click on the !Advance application directory.

2 Open the Menus subdirectory.

3 Click menu on the file `WP` and use the **Copy** option to make a copy of the file. Call it `WPold`.

4 Open the file `WP`.

5 Options appear on the Word Processor menu if there is a `Y` (or a `y`) before the menu text in this file. So, to remove an option, all you have to do is to replace a `Y` with an `N`. Do not make any other changes to the file.

6 Save the file, quit and reload Advance for the new menu structure to be operative.

You can restore the original menu structure in future by discarding the new, edited `WP` file, and renaming `oldWP` as `WP`. Quit Advance then reload it for the original structure to apply.

Configuring Advance Spreadsheet menus

Disabling menu options

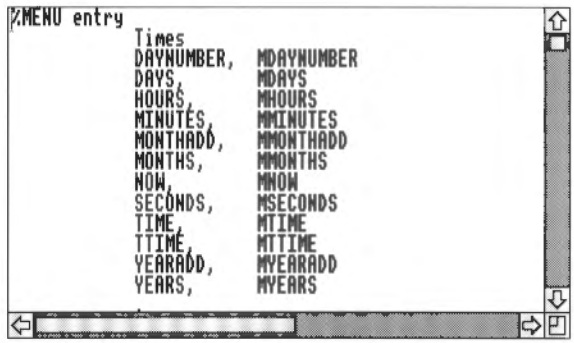
To remove options from Advance Spreadsheet menus, you need to change the Spreadsheet's menu file:

1 Shift-double-click on the !Advance application directory.

2 Open the Menus subdirectory.

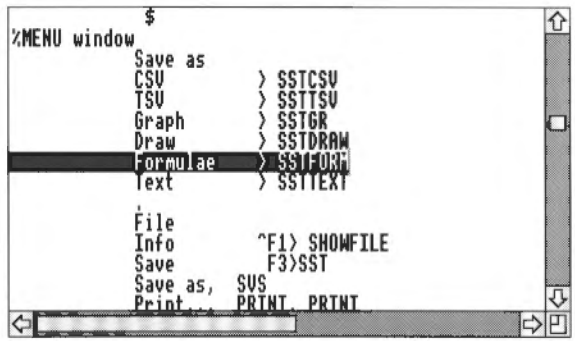
3 Click menu on the file SH and use the **Copy** option to make a copy of the file. Call it SHold.

4 Open the file SH:



5 To disable a menu option, delete the line containing that option in the file SH.

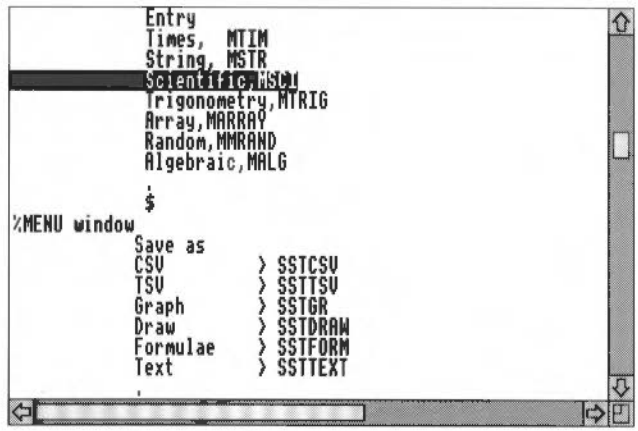
For example, to disable the **File/Save as/Formulae** option, delete the line shown below:



6 Press F3 to save the file SH. Then quit the file.

7 Use the icon bar menu to quit the !Advance application. Then restart it by double-clicking on the application icon. Next time you open a spreadsheet, the **File/Save as/Formulae** option will not appear in the menu structure.

You can disable a whole submenu, not just one option, using the same method. For example, to disable the Scientific functions when clicking on the Function button, delete the following line:



You don't need to delete all the lines defining the Scientific function options themselves; only the line that defines the submenu entry.

Reverting to the original spreadsheet menu options

As long as you made a copy of the original file SH, you can go back to using all the original menu options:

1. Either rename or delete your **edited** version of the file SH.
2. Rename your copy of the **original** file (which you probably called SHold) to SH.
3. Quit Advance, then restart it. The spreadsheet application will now use the original menu structure.

Configuring Advance Database menus

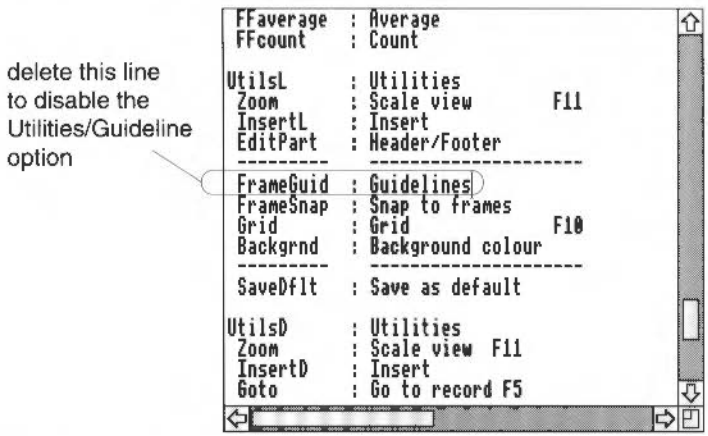
Disabling menu options

To remove options from Advance Database menus, you need to change the Database's menu file:

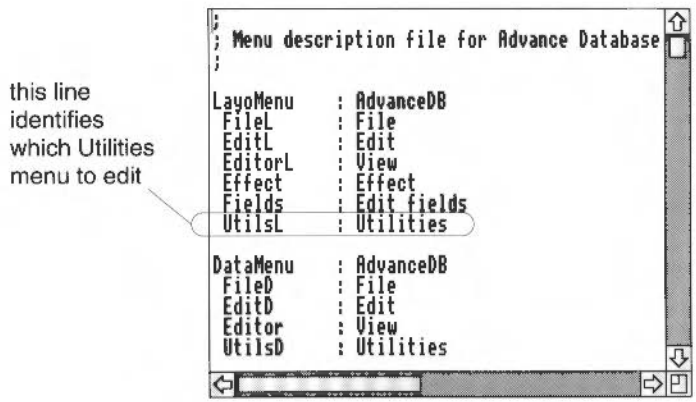
1. Shift-double-click on the !Advance application directory.
2. Open the Menus subdirectory.
3. Click menu on the file DB and use the **Copy** option to make a copy of the file. Call it DBold.
4. Open the file DB.

5 To disable a menu option, delete the line containing that option in the file DB.

For example, to disable the **Utilities/Guidelines** option in the Layout editor, delete the following line:



As there are several windows in the database, each with its own menu structure, you must take care to delete the right option in the right menu. For instance, there are several definitions of a `Utilities` menu in the DB file (each window has a slightly different Utilities menu). The one used by the Layout editor can be identified because it is defined as `UtilsL` at the beginning of the file, inside `LayoMenu`:



6 Press F3 to save the file DB. Then quit the file.

7 Use the icon bar menu to quit the !Advance application. Then restart it by double-clicking on the application icon. Next time you enter the layout window, the **Utilities/Guidelines** option will not appear in the menu structure.

original menu options:

1. Either rename or delete your **edited** version of the file SH.
2. Rename your copy of the **original** file (which you probably called SHold) to SH.
3. Quit Advance, then restart it. The spreadsheet application will now use the original menu structure.

Configuring Advance Database menus

Disabling menu options

To remove options from Advance Database menus, you need to change the Database's menu file:

1. Shift-double-click on the !Advance application directory.
2. Open the Menus subdirectory.
3. Click menu on the file DB and use the **Copy** option to make a copy of the file. Call it DBold.

You don't need to delete all the lines defining the Sort Utilities options themselves; only the line that defines the submenu entry.

Reverting to the original database menu options

As long as you made a copy of the original file DB, you can go back to using all the original menu options:

1. Either rename or delete your **edited** version of the file DB.
2. Rename your copy of the **original** file (which you probably called DBold) to DB.
3. Quit Advance, then restart it. The database application will now use the original menu structure.

Configuring Advance Graph menus

Disabling menu options

To remove options from Advance Graph menus, you need to change the Graph tool's menu file:

1. Shift-double-click on the !Advance application directory.
2. Open the menus subdirectory.
3. Click menu on the file GR and use the **Copy** option to make a copy of the file. Call it GRold.
4. Open the file GR.

5 To disable a menu option, delete the line containing that option in the file GR.

For example, to disable the **Graph/Grouping** option in the Graph tool, delete the following line:

delete this line to disable the Graph/Grouping option

```
---------    -------------
SelectAll  : Select all ^A
Clear      : Clear      ^Z

GraphMenu  : Graph
GroupBox   : Grouping
TypeMenu   : Type
Scale      : Scale
StyleMenu  : Options

StyleMenu      : Style
Key            : Key
Grid           : Grid      F10
```

6 Press F3 to save the file GR. Then quit the file.

7 Use the icon bar menu to quit the !Advance application. Then restart it by double-clicking on the application icon. Next time you enter the Graph tool, the **Graph/Grouping** option will not appear in the menu structure.

You can disable a whole submenu, not just one option, using the same method. For example, to disable the Effect submenu in the Graph tool, delete the following line:

delete this line to disable the Effect submenu

```
EffectMenu : Effect
TextFont   : Text font
TextSize   : Text size
TextFore   : Text colour
---------    ----------------
Italic     : Italic        ^I
Bold       : Bold          ^B
---------    ----------------
LineSpace  : Line spacing ⇧^L
Align      : Alignment
---------    ----------------
TextBack   : Fill colour
Border     : Border
```

You don't need to delete all the lines defining the Effect options themselves; only the line that defines the submenu entry.

Reverting to the original Graph menu options

As long as you made a copy of the original file GR, you can go back to using all the original menu options:

1 Either rename or delete your **edited** version of the file GR.

2 Rename your copy of the **original** file (which you probably called `GRold`) to `GR`.

3 Quit Advance, then restart it. The Graph tool will now use the original menu structure.

Appendix D: Keyboard short-cuts

This appendix lists the keyboard short-cuts available in each Advance tool. You'll need to know the following terminology:

- ^X means press Ctrl-X
- ⇑F10 means press Shift-F10
- ^⇑F8 means press Ctrl-Shift-F8
- Shaded items are common to all tools.

Keyboard short-cuts

Key sequence	Word Processor	Spreadsheet	Database	Graph
F3	File Save	File Save	File Save	File Save
F4	Find		Search	
F5	Goto page	Goto cell	Goto record	
F6	Spell check	Sort	Sort	
F7		Graph	Graph	
F8		Number format		
F10		Display grid	Display grid	Display grid
F11	Scale view	Scale view	Scale view	Scale view
⇑F1	Scale 10%	Scale 10%	Scale 10%	Scale 10%
⇑F2	Scale 20%	Scale 20%	Scale 20%	Scale 20%
⇑F3	Scale 30%	Scale 30%	Scale 30%	Scale 30%
⇑F4	Scale 40%	Scale 40%	Scale 40%	Scale 40%
⇑F5	Scale 50%	Scale 50%	Scale 50%	Scale 50%
⇑F6	Scale 60%	Scale 60%	Scale 60%	Scale 60%
⇑F7	Scale 70%	Scale 70%	Scale 70%	Scale 70%
⇑F8	Scale 80%	Scale 80%	Scale 80%	Scale 80%
⇑F9	Scale 90%	Scale 90%	Scale 90%	Scale 90%

Key sequence	Word Processor	Spreadsheet	Database	Graph
⇑F10	Scale 100%	Scale 100%	Scale 100%	Scale 100%
⇑F11	Scale x0.5	Scale x0.5	Scale x0.5	Scale x0.5
^F1	About this file	About this file	About this file	About this file
^F2	Close window	Close window	Close window	Close window
^F3	Save text/graphics			
^F5	Left align	Left align	Left align	
^F6	Centre align	Centre align	Centre align	
^F7	Right align	Right align	Right align	
^F8	Fully justify			
^F9			View Single record	
^F10			View All records	
^F11			View Report	
^⇑F8		Input block		
^⇑F10			Edit Layout	
^⇑F11	Scale x2	Scale x2	Scale x2	Scale x2
^A	Select all	Select all	Select all	Select all
^B	Bold	Bold	Bold	Bold
^C	Copy	Copy	Copy	Copy
^D			Duplicate record	
^E		Recalculate sheets	Add empty record	
^F	Spell check from caret		Insert frame	
^G	Page break			
^I	Italic	Italic	Italic	Italic
^K	Delete	Delete	Delete	Delete
^L	Cut line		Cut line	Cut line
^N	Next page			
^O	Frame outlines on/off	Labels on/off		

Key sequence	Word Processor	Spreadsheet	Database	Graph
^P	Previous page			
^Q	Select word @ caret		Select word @ caret	
^S	Swap case of char			
^U		Delete from Entry area		
^V	Paste	Paste	Paste	Paste
^W	Spell check word			
^X	Cut	Cut	Cut	Cut
^Y		Move		
^Z	Clear	Clear	Clear	Clear
^@	Select paragraph			
^]	Insert single opening quote			
^\	Insert single closing quote			
^⇑A	Alter pages			
^⇑D	Insert current date			
^⇑H	Insert bullet character			
^⇑J	Superscript			
^⇑K	Subscript			
^⇑L	Line spacing		Line spacing	
^⇑P	Page rulers		Insert page number	
^⇑R	Show ruler			
^⇑S	Other text size		Other text size	Other text size
^⇑U	Underline			
^⇑]	Insert double opening quote			
^⇑\	Insert double closing quote			
Print	Display PRINT dbox	Display PRINT dbox	Display PRINT dbox	Display PRINT dbox

Key sequence	Word Processor	Spreadsheet	Database	Graph
Insert	Paste		Paste	Paste
Delete	Delete caret left	Delete caret left	Delete caret left or Delete record	Delete caret left
Home	Start of document	Select first cell	Start of line	Start of text
Copy	Delete caret right	Delete caret right	Delete caret right	Delete caret right
^Copy	Cut line		Select line	Select line
Page Up	Scroll up 1 window	Scroll up 1 window	Previous card	Top of text
Page Down	Scroll down 1 window	Scroll down 1 window	Next card	Bottom of text
Cursor up	Caret up 1 line	Select 1 cell up	Edit previous field/card	Caret up 1 line
Cursor down	Caret down 1 line	Select 1 cell down	Edit next field/card	Caret down 1 line
Cursor left	Caret left 1 char	Select 1 cell left	Caret left 1 char	Caret left 1 char
Cursor right	Caret right 1 char	Select 1 cell right	Caret right 1 char	Caret right 1 char
⇑Cursor up	Scroll up 1 window	Scroll up 1 window	Previous card	Top of text
⇑Cursor down	Scroll down 1 window	Scroll down 1 window	Next card	Bottom of text
⇑Cursor left	Caret right 1 word	Caret right 1 word	Caret right 1 word	Caret right 1 word
⇑Cursor right	Caret left 1 word	Caret left 1 word	Caret left 1 word	Caret left 1 word
^Cursor up	Start of document	Select top cell	First card	Start of text
^Cursor down	End of document	Select bottom cell	Last card	End of text
^Cursor left	Start of line	Select left cell	Start of line	Start of line
^Cursor right	End of line	Select right cell	End of line	End of line
^⇑Cursor arrows	Same as clicking on Scroll arrows			

Appendix E: Using expressions in Advance Spreadsheet

This appendix tells you about mathematical expressions (formulæ) and how you can use them in Advance Spreadsheet to calculate values for you. It is intended as reference material, useful as a guide when formulating complex expressions. You don't need to understand all of this chapter for everyday use of Advance Spreadsheet. Some of the material has already been covered in earlier chapters, but it's useful to have all the information in one place.

Expressions are worked out by applying mathematical **operators** (e.g. + and –) and **standard functions** (e.g. SQRT and SUM) to **operands** (see below). The order of application is governed by the algebraic rules of precedence (see *Rules of precedence* on page 330). For example, in the expression

```
SQRT(G5 + 5.7)
```

the operands (values) are the contents of cell G5 and the number 5.7. These values are added together by the + operator and then the standard function, SQRT, is applied to the result to give a final value.

Operands

Operands can either be fixed explicit values (constants) or variable values, such as the contents of a cell in the spreadsheet which may change.

Constants can be grouped into four different types:

- An **integer**, or whole number in the range –2147483648 to 2147483647
- A **real number** – a number written with a decimal point, or in 'scientific' notation (or both). Such numbers are handled with about 15 places of precision and a range spanning 10e–320 to 10e307. So it may be that a calculation that uses more than 15 decimal places will vary at the 15th decimal place.
- A **string** or sequence of characters of any length.
- An **error marker**, which is the result of a forbidden operation such as division by zero.

For most practical purposes you do not have to be aware of these different types, since Advance converts between them automatically.

Integers

The usual way to write an integer constant is to use the standard decimal notation:

```
34        1234        0                    (i.e. no decimal point)
```

You can also use hexadecimal numbers (base 16) and the hexadecimal digits, 0 1 2 3 4 5 6 7 8 9 A B C D E and F.

You must precede hexadecimal numbers by the code 0X – you can use either upper or lower case letters. For example:

```
0XFFFFFFC4        0xf00d
```

Hexadecimal numbers are intended for specialised purposes – if you don't know what they are, you can ignore them.

Real numbers

A real number constant is usually written as a sequence of digits with a decimal point. For example:

```
3.14159265        123.0
0.00006875        10.89
```

Scientific notation

For very large or very small numbers, you can use an exponent or **scale factor** which indicates how many places the decimal point must be moved. Positive exponents move the decimal point to the right, and negative exponents, to the left. In both cases, any necessary zeros are inserted automatically. The scale factor is written as an ordinary decimal integer, preceded by an 'e' (or an 'E'), and possibly a minus sign. For example:

`24.65e7` means `246500000.0` (decimal point 7 places right).

`3.4e-10` means `0.00000000034` (decimal point 10 places left).

String constants

A string constant is basically (almost) any sequence of characters enclosed in double quotes, like this:

```
"Archimedes"
"Leapt from his bath"
```

If you have to include " or \ inside the string constant, you must precede each of these signs with the backslash character. Note that all control codes are forbidden in a string.

Spreadsheet cells

In addition to constants, you can also use references to spreadsheet cells as operands. You specify them by quoting their column name immediately followed by their row name (or in the form R<Row Number>C<Column Number>).

Fixed and external references

You can use a fixed reference as an operand by prefixing either the column or row (or both) identifier with the @ symbol (see *Defining a fixed reference* on page 155). If the cell is in another spreadsheet then you can refer to it by putting `!<Name of sheet>.` in front of the cell (see *Using references to another spreadsheet* on page 164). If this is not present the reference is assumed to be in the current sheet. For example:

CC11	means	Cell in Column CC, row 11 in this sheet
!Fred.@B@2	means	Cell in column B, row 2 in sheet Fred
R4C3	means	Cell in column C, row 4 in this sheet

When a cell reference is encountered in an expression, the value of that cell is substituted for the cell reference. If the cell has no value then either 0 or the error `Reference to undefined cell` will be used depending on the Empty cell rule (see *Empty cell values* on page 149).

Conversion between types

Whenever necessary, Advance Spreadsheet will convert operands from one type to another. The following conversions can take place:

- An integer can be converted to a string. It appears as a sequence of decimal digits. For example, 137 becomes "137".
- A real number can be converted to a string. It appears as a decimal number, with as many places after the decimal point as are necessary (i.e. in General format). For example, 23.456 becomes "23.456". If the number is very large or small, it appears in Scientific format.
- A string can be converted to a number (of either type). The system starts at the left and uses up as many characters as make sense, ignoring the rest:

"78"	becomes	78
"34.4"	becomes	34.4
"19th Century"	becomes	19
"Seven"	becomes	0

- A real number can be converted to an integer. In this case the fractional part is discarded, so that 34.567 becomes 34.

These conversions only take place when the context requires it – that is, when a string appears in a cell which is within a block being summed.

Operators

Operators fall into the following groups:

- Arithmetic
- Logical
- Relational
- String
- Block.

If any operator is applied to an error value, in most cases the result is the same error value. If it is applied to two error values the result can be either of them.

Arithmetic operators

One arithmetic operator (initial minus) takes a single value and returns its negative. This is called **monadic minus**. Monadic minus is indicated by a minus sign at the beginning of an expression or immediately following a left-hand bracket. Every other arithmetic operator takes two operands and combines them, according to certain rules, to produce a result. Such operators are called **dyadic**.

The dyadic arithmetic operators include

^	(to the power of)
*	(multiplication)
/	(division)
+	(addition)
–	(subtraction)
MOD or %	(remainder).

+, – and * can all take a pair of integer values and produce an integer result, or a pair of real values and produce a real result. Type conversions are applied as necessary. For example:

`3 + 2 = 5`	(no conversions – integer result)
`3.2 - 1.7 =1.5`	(no conversions – real result)
`4 * 1.5 = 6.0`	(4 is converted to 4.0 – real result)
`"12" +"3 dozen" =15`	("12" is converted to 12 and "3 dozen" is converted to 3).

`7 + Division by zero` = Division by zero.

If the result of an integer operation is too large to be stored as an integer, it is automatically converted to the real form.

/ (division) and MOD or % (remainder) always convert their operands to real form and generate real answers. Division or remaindering by zero is forbidden and produces an error message.

Advance Spreadsheet provides a 'raise to the power of' operator, written as ^ (up arrow). A^B means 'A raised to the power of B'. The two operands may both be integers or real numbers, but if A is negative, B must be an integer.

Logical operators

Unless you need to use logical operations, you can skip this section.

Logical operations all take place on integer quantities, which are assumed to be represented by 32-bit signed binary numbers in 2's complement notation. If an operand of a logical operator is of type real or string, it is converted to an integer, using the rules given in *Conversion between types* on page 325. The logical operators are:

- NOT (alternative form: not)
- AND (alternative forms: and, &)
- OR (alternative forms: or, |)
- NEQ (alternative forms: neq, **)
- << (logical left shift)
- >> (logical right shift)

The NOT operator is monadic; it takes a single value, and inverts every binary digit in it. For example:

```
NOT 0x12345678 = 0xEDCBA987
```

All the other logical operators are dyadic, and take two operands each.

A AND B	produces a value C where a bit is set to 1 wherever the corresponding bits in both A and B are 1's.
A OR B	produces a value C where a bit is set to one if either (or both) the corresponding bits in A and B are 1's.
A NEQ B	produces a value C where a bit is set to 1 wherever the corresponding bits in A and B are different (an exclusive OR).
A << B	produces a value C which is A shifted B binary places to the left. The left-most digits of A are lost, and the new value is padded with zeros on the right.
A >> B	produces a value C which is A shifted B binary places to the right. The right-most digits of A are lost, and the new value is padded with zeros on the left.

Some examples of logical operations are:

```
0xC AND 0xA              =       0x8
0xC OR 0xA               =       0xE
0xC NEQ 0xA              =       0x6
0xC << 0xA               =       0x300
0xC >> 1                 =       0x6
0xABCD754 >> 8           =       0x00ABCD75
```

Relational operators

A relational operator compares two values and generates a result which is always 1 if the relation is true, and 0 if the relation is false.

The relational operators can be applied to pairs of numbers, pairs of strings, or even (in some cases) to pairs of error markers. The six operators are:

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

For example:

`7 = 7` gives `1` (because it is true that 7 = 7)
`7 = 9` gives `0` (because it is false that 7 = 9)

`"Henry" <> "George"` gives `1`
(because it is true that "Henry" is not the same as George)

The type conversion rules for relations are somewhat different from those used with other operators.

- If both operands are numbers, then the comparison is numerical, so that, for example, 9 <10 is true.
- If both operands are strings, then the comparison is alphabetic and uses the ASCII ordering of the characters. Since string comparison is an entirely different process from numeric comparison, this can sometimes produce logical but unexpected results. For example:

  `"Archimedes" < "BBC"` is true, and

  `"9" < "10"` is false (!)
- If one of the operands is a string and the other is a number, then the number is converted to a string for the comparison. For example:

  `"567" = 567` is true, and `"81" > 12345` is also true (!)

The main use of relational operators is in conditional expressions, which are described in *Conditional expressions* on page 331 and *Using conditional expressions in a formula* on page 170. However, they can also be used in their own right. For example, consider the situation where the royalty payable is 15% on the excess over £2000, (if any). If the actual sum to be taxed is held in cell G5, a suitable expression would be:

```
(G5 > 2000) * (0.15 * (G5 - 2000))
```

Notice that the multiplier (G5 > 2000) is zero if the condition is false. This ensures that the royalty does not work out as a negative number for sums less than £2000.

String operators

The only string manipulation provided as an operator is concatenation, written CAT (or cat). This operator takes two strings and joins them together. If either (or both) the operands are numbers, they are converted to strings. The result of the operation is always a string. Examples are:

```
"Lucrezia" cat "Borgia" = "LucreziaBorgia" (sic – no internal space)

"Henry" cat" "cat "VIII" = "Henry VIII"

34 cat 45 = "3445"

12 + (3 cat 7) = 49
```

[BASIC experts may note that cat is similar to the 'string +' operator in BASIC. The plus sign cannot be used here because the possibility of type conversions would make it ambiguous.]

Block operators

Certain standard functions, such as those you would use to calculate the sum or the mean of a group of numbers, use blocks as their operands. Any two cell names in the same spreadsheet can be made into a block by using the block operator ><. The cell names are taken as opposite corners of the block.

For example, a block of 20 cells (5 rows and four columns) is specified by:

```
F5 >< J8
```

The same block can also be written as J8><F5, F8><J5, or J5><F8.

Spaces between operations

Some operator types require a space after them when they are followed by further operations within an expression. For example:

```
A3 MOD 4
```

The spaces after the `A3` and `MOD` are essential. Similarly:

```
"abc" CAT CHR(55)
```

The space after `CAT` is essential.

Standard functions

In an expression, standard functions are written with their operands enclosed in brackets and separated commas, as in:

```
SQRT(V5)
MID(X7,4,3)
```

Each standard function is described in *Appendix F: Using Advance Spreadsheet functions* on page 333.

Rules of precedence

When an expression is evaluated, the order in which the operators are applied is normally controlled by the rules of precedence. These rules place the operators in an ordered hierarchy, and specify that operators nearer the top are applied first. To give a simple example, * has a higher precedence than +, so in an expression like

```
A1 + A2 * A3
```

the multiplication is done before the addition. (This is entirely consistent with the normal rules of algebra). When two or more operators are to be found at the same level of the hierarchy, they are evaluated from left to right. The precedence hierarchy is:

Top:	Monadic minus, NOT
Next:	^
Next:	*, / and MOD, cat
Next:	+ and –
Next:	>>, << and >>>
Next:	=, <>,
Next:	<, <=, >, >=
Next:	AND
Last:	OR, NEQ

You can change the order of evaluation by using brackets or the symbols IF, THEN, ELSE and ENDIF (see the next section). Following the conventional rules of algebra, any part of an expression which is enclosed in brackets is evaluated first. This applies recursively to nested brackets. For example, in the expression

```
(A1+A2) * A3
```

the addition is done before the multiplication. Errors involving the rules of precedence are quite common. For example, it is easy to forget that << has a lower precedence than +, and to write

```
A4 + 4<<3
```

with the intended meaning of A4 + 32, but with an actual effect which is entirely different! The best way of preventing these errors is to use plenty of brackets:

```
A4+(4<<3)
```

or even

```
(A4+(4<<3))
```

Conditional expressions

You can use the symbols IF...THEN...ELSE...ENDIF to build **conditional expressions**, and allow parts of expressions to be skipped altogether. In an expression which uses these symbols, you would place a sub-expression after each of the first three symbols, like this:

```
IF <sub-exp 1> THEN <sub-exp 2> ELSE <sub-expr 3> ENDIF
```

This construction has the following effect:

First, the system works out <sub-exp 1>. If its value if anything other than zero, it uses <sub-exp 2> and skips <sub-exp 3>; but otherwise it discards <sub-exp 2> and takes <sub-exp 3> instead. For example,

```
IF X5 >= 50 THEN "PASS" ELSE "FAIL" ENDIF
```

first compares X5 with the number 50. If the relation holds, the system delivers the constant "PASS"; otherwise it delivers "FAIL".

The sub-expressions can be of any complexity; they may even contain nested IF...THEN...ELSE...ENDIF constructions. The whole construction itself can be used as an operand and combined with other elements of an expression. For example:

```
IF V5 < 18 THEN "Child"
        ELSE    IF V5 >= 65     THEN "Pensioner"
                ELSE "Adult"
        ENDIF
ENDIF
```

and

```
V4 + IF G6 = H7 THEN V5-7 ELSE 7-V5 ENDIF * 6
```

Notes: don't forget you actually have to write expressions on one line!

You can use upper or lower case (or a mixture of them) for the keywords IF, THEN ELSE and ENDIF. An alternative form of ENDIF is written FI.

Appendix F: Using Advance Spreadsheet functions

You've already met functions in *Using a function* on page 104 and *More about formulæ and functions* on page 158. As well as repeating some of the things with which you might already be familiar, this appendix contains much more technical information about the standard functions that come supplied with Advance Spreadsheet. You'll find it useful to have all this information here for reference.

Spreadsheet functions summary on page 336 gives a brief list of all the standard functions available in Advance Spreadsheet. *Appendix G: Spreadsheet functions reference* on page 341 explains in detail how to use each function.

Function arguments

The general format of a standard function is:

`name(arguments)`

where `name` is the name of the function itself (e.g. SQRT or LOG) and the *`arguments`* are the items you want used in the calculation. You specify the arguments by enclosing them in brackets after the function name. There are several types of argument:

- **number** – a numeric value (e.g. 34, 23.567, 1.3e-12)
- **string** – a string value (e.g. some text, enclosed in quotes)
- **value** – either a number or a string
- **block** – a block address or block name (e.g. C12><G22)
- **value-list** – a list of one or more values
- **list** – a list of one or more arguments.

Number

You can specify a numeric value in two ways: by typing it directly into the function, or by enabling Edit mode and then clicking on a cell. For example:

```
INT(23.45)          Number typed directly
INT(!sheet1.E7)     Cell address
```

String

Specifying a string value is similar to specifying a numeric value. When you enter a string as an argument to a function, however, you **must** enclose it in quotation marks:

`LEN("horse")`	String typed directly. Must be enclosed in quotation marks.
LEN(!sheet1.A5)	Cell address (cell A5 contains a string).

Block

Some standard functions use a block of values as an argument. To specify a block, type in the cell addresses of the two opposite corner cells separated by the **><** symbols (e.g. A2><F5). Alternatively, go into Edit mode and drag the pointer over the block of cells you wish to use as a block argument (see *Entering cell or block references with the mouse* on page 113).

Notes:

Upper and lower case letters are equivalent in function names.

Where arguments are described as 'numbers', strings are acceptable and are automatically converted to numerical values using any leading decimal digits. Thus the string "17 oranges and 8 apples" would be converted to the number 17.

Where arguments are described as 'strings', numbers are acceptable and are automatically converted to string form. If a number is not an integer, the required number of decimal places is used.

Function types

This section gives further information about some of the function types.

String functions

Some string functions combine both numeric and string arguments, so you must be particularly careful when using functions that work with string values.

Some string functions treat numerics as string values for example, `ASC(-1)` is treated as `ASC("-1")` and `LEN(123)` is treated as `LEN("123")`.

Time functions

Times are stored as seconds after midnight on February 29th 0BC, on the false but useful assumption that the Gregorian calendar can be extended back to that time without irregularity. The leap-second at the end of 1987 is ignored.

Times before the Christian era are represented by negative numbers. If current estimates of the age of the Universe are roughly right the range of numbers is sufficient to handle all historical and geological times correctly. Be careful if you are using data that spans AD and BC, as dates are not well defined for this period.

Advance Spreadsheet provides several functions to translate times between internal format and more common units.

Note: If you want a cell to display a time (or date) you must set the Number format of the cell to Time (or Date) **before** you enter the data.

In the description which follows, a 'temporal' is a number which is to be interpreted as a time. The functions will generate results with any arguments, but they may not be meaningful.

Trigonometrical functions

You can choose whether the spreadsheet treats numbers as degrees or radians when using trigonometrical functions. Use the **Utilities/Angle mode** menu option to set your preferred mode.

Array functions

Array functions are similar to Algebraic functions, except that the argument is a block, not a single number. When using these functions, empty cells are ignored.

Spreadsheet functions summary

This section only gives a brief description of all the functions available in Advance Spreadsheet. For a full description, see *Appendix G: Spreadsheet functions reference* on page 341.

Time functions

DAYNUMBER(temporal)
Returns the week day number contained in a temporal value.

DAYS(temporal)
Returns the month day number contained in a temporal value.

HOURS(temporal)
Returns the hour number contained in a temporal value.

MINUTES(temporal)
Returns the minute number contained in a temporal value.

MONTHADD(temporal)
Adds one month to the temporal value.

MONTHS(temporal)
Returns the month number contained in a temporal value.

NOW()
Returns a temporal value corresponding to the date and time given by the system clock.

SECONDS(temporal)
Returns the second number contained in a temporal value.

TIME(temporal)
Returns the date and time equivalent of a temporal value.

TTIME(year,month,day,hor,minute,second)
Returns a temporal value given the date and time.

YEARADD(temporal)
Adds one year to the temporal value.

YEARS(temporal)
Returns the year number contained in a temporal value.

String functions

ASC(string or number)
ASCII code of the string or number.

CHR(number)
Converts number into ASCII string equivalent.

FIND(string,string)
Finds the occurrence of one string in another.

LEFT(string,number)
The left most number characters in string.

LEN(string)
The number of characters in string.

LOWER(string)
Converts strings to lower case.

MID(string,start number,finish number)
Extracts characters from string.

RIGHT(string,number)
The right most number characters in string.

UPPER(string)
Converts strings to upper case.

Scientific functions

COSH(number)
Hyperbolic cosine of number.

EXP(number)
The number e raised to the number power.

LN(number)
Natural log of number (i.e. base e).

LOG(number)
Log of number, base 10.

SINH(number)
Hyperbolic sine of number.

SQRT(number)
Square root of number.

TANH(number)
Hyperbolic tangent of number.

Trigonometrical functions

ACOS(number)
Arc cosine of number.

ACOT(number)
Arc cotangent of number.

ASIN(number)
Arc sin of number.

ATAN(number)
Two-quadrant arc tangent of number.

COS(number)
Cosine of number.

COT(number)
Cotangent of number.

DEG(number)
Converts number (in radians) to degrees.

RAD(number)
Converts number (in degrees) to radians.

SIN(number)
Sine of number.

TAN(number)
Tangent of number.

Array functions

ALL(block)
Returns +1 if the values in a block are all non-zero.

AVERAGE(block)
Gives the average of values in block.

COUNT(block)
Counts the number of non-zero cells in block.

ESTDEV(block)
Gives the estimated standard deviation of the mean.

MAX(block)
Returns the value of the largest element in block.

MIN(block)
Returns the value of the smallest element in block.

PRODUCT(block)
Multiplies together all elements of block.

STDEV(block)
Standard deviation of all elements of block.

SUM(block)
Arithmetic sum of items in block.

Random functions

GAUSS(number1, number2)
A random number with gaussian distribution.

RAND(number)
Random number between 0 and number.

Algebraic functions

ABS(number)
Absolute value of number.

CEIL(number)
Smallest integer greater than or equal to number.

FLOOR(number)
The largest integer less than or equal to number.

INT(number)
The largest integer less than or equal to number.

ROUND(number, integer)
Number rounded to integer decimal places.

SIGN(number)
Returns +1 if number positive, −1 if negative, 0 if zero

Appendix G: Spreadsheet functions reference

ABS(number)

Absolute value of `number`.

Result

Returns the absolute value of the argument The absolute value of a number is the number without its sign.

Examples

```
ABS(5.4) = 5.4
ABS(-7.8)= 7.8
```

Related functions

`SIGN` returns the sign of a number as a value: 1 (positive), −1 (negative), or 0 (zero).

ACOS(number)

Arc-cosine of `number`.

Result

The inverse cosine of the argument.

Comments

The result is delivered in radians if the current mode is 'radians'; otherwise degrees.

Related functions

`COS` returns the cosine of a number.

ACOT(number)

Arc-cotangent of `number`.

Result

The inverse cotangent of the argument.

Examples

```
ACOT(1) = 45°
ACOT(0.5)= 63.43495°
```

Comments

The result is delivered in radians if the current mode is 'radians'; otherwise degrees.

Related functions

`COT` returns the cotangent of a number.

ALL(block)

Returns +1 if all the values in a `block` are non-zero.

Result

+1 if all the elements are different from zero; otherwise 0.

Example

```
ALL(B3><Q7)
```

Comment

Blank or empty cells in the block are treated as containing zero unless the Empty cell value is configured to be an error. If the Empty cell value is configured to be an error, the cell is flagged with the error message, `Reference to undefined cell`.

ASC(string)

Returns the numeric ASCII code of the first character in `string`.

Result

The (integer) ASCII code of the first character in the string argument.

Examples

```
ASC("H")= 72
ASC("Hello")= 72
ASC(1)= 49
```

Related functions

`CHR` converts a number into its ASCII character equivalent.

ASIN(number)

Returns the Arc-sine of `number`.

Result

The inverse sine of the argument.

Examples

```
ASIN(1)= 90.0°
ASIN(0.5)= 30.0°
```

Comments

The argument must lie in the interval −1 to + 1 inclusive.

The result is delivered in radians (in the range $-\pi/2$ to $\pi/2$) if the current mode is 'radians'; otherwise degrees.

Related functions

`SIN` returns the sine of a number.

ATAN(number)

Returns the Arc-tangent of `number`.

Result

The inverse tangent of the argument.

Examples

```
ATAN(1)= 45.0°
ATAN(0.5)= 26.56505177°
         = 0.4635 rad
```

Comments

The result is delivered in radians (in the range $-\pi/2$ to $\pi/2$) if the current mode is 'radians'; otherwise degrees.

Related functions

`TAN` returns the tangent of a number.

AVERAGE(block)

Gives the average of defined values in `block`.

Result

Gives the mean of all the elements.

Example

```
AVERAGE (B3><Q6)
```

Comment

Blank or empty cells in the block are treated as containing 0.

Related functions

`SUM` adds its arguments together. `PRODUCT` multiplies its arguments together. `COUNT` counts the number of non-zero arguments.

CEIL(number)

Gives the smallest integer greater than or equal to `number`.

Result

The smallest integer greater than or equal to the argument.

Examples

```
CEIL(4.7) = 5
CEIL(-5.9)= -5
```

Related functions

`FLOOR` and `INT` return the largest integer less than or equal to `number`.

CHR(number)

Returns the ASCII character corresponding to `number`.

Result

A one-character string. The ASCII code of the character is given by the argument.

Examples

```
CHR(72)= "H"
CHR(49)= "1"
```

Restriction

The argument may not be negative, 0 or any multiple of 256.

Possible faults

'Argument must be positive' – when `CHR(-5)`.

'Chr function of null byte' – when `CHR(blank cell)`.

Related functions

`ASC` returns the numeric ASCII code of the first character in a string.

COS(number)

Returns the cosine of `number`.

Result

The cosine of the argument. The result lies between −1 and 1 inclusive.

Examples

```
COS(0) = 1              argument in radians
COS(45)= 0.70710678     argument in degrees
COS(45)= 0.525322       argument in radians
```

Comments

The argument is taken to be in radians if in 'radians' mode; otherwise degrees.

Related functions

`ACOS` returns the arc-cosine of a number.

COSH(number)

Gives the hyperbolic cosine of `number`.

Result

The hyperbolic cosine of the argument.

Examples

```
COSH(0) = 1             argument in radians
COSH(45)= 1.32461       argument in degrees
```

Comments

The argument is taken to be in radians if the 'radians' mode is on; otherwise degrees. The argument (in radians) must be less than or equal to 300.

Related functions

`COS` returns the cosine of a number.

COT(number)

Cotangent of `number`.

Result

The cotangent of the argument.

Examples

```
COT(1) = 57.28996        argument in degrees
COT(45)= 1.0             argument in degrees
```

Comments

The argument is taken to be in radians if the 'radians' mode is on; otherwise degrees.

Related functions

`ACOT` returns the arc-cotangent of a number.

COUNT(block)

Counts the number of cells in a `block` that equate to values other than zero.

Result

The number of elements in the parameter array which are non-zero.

Example

```
COUNT(A1><T5)
```

Comment

Count only counts non-empty cells containing numbers, or text that can be interpreted as a number.

Blank or empty cells in the block are ignored unless the Empty cell value is configured to be an error. If the Empty cell value is configured to be an error, the cell is flagged with the error message, `Reference to undefined cell`.

Related functions

`AVERAGE` averages its arguments. `SUM` adds its arguments. `PRODUCT` multiplies its arguments.

DAYNUMBER(temporal)

Returns a number corresponding to a day of the week. The temporal value is the number of seconds since 0BC.

Result

A number which gives the corresponding day of the week, using the code:

Sunday = 0
Monday = 1 to Saturday = 6

Example

```
DAYNUMBER(62786932984)= 5
```
Friday

Related functions

The temporal functions are: `TIME`, `YEARS`, `MONTHS`, `DAYS`, `HOURS`, `MINUTES`, `SECONDS`, `YEARADD` and `MONTHADD`.

`TTIME` takes a date and time as an argument and returns the corresponding temporal value. `NOW` returns a temporal value corresponding to the date and time of the system clock. `DAYS` returns a number corresponding to the day of the month.

DAYS(temporal)

Returns a number corresponding to a day of the month. The temporal value is the number of seconds since 0BC.

Result

A number which gives the month day of the given time, in the range 1 – 31.

Example

```
DAYS(62786932984)= 20
```

Related functions

The temporal functions are: `TIME`, `YEARS`, `MONTHS`, `DAYS`, `HOURS`, `MINUTES`, `SECONDS`, `YEARADD` and `MONTHADD`.

Other related functions are `TTIME`, `NOW` and `DAYNUMBER`.

DEG(number)

Converts `number` in radians to degrees.

Result

The equivalent of the argument in degrees.

Example

```
DEG(1)= 57.29578°
```

Comments

The argument is taken to be in radians (always).

Related functions

`RAD` converts number in degrees to radians.

ESTDEV(block)

Gives the estimated standard deviation of the parent population from which the known elements in the block are taken

Result

The best estimate of the standard deviation of the parent population from which the known elements in the block are taken.

Examples

```
ESTDEV(A1><Q6)
```

Comment

Blank or empty cells in the block are treated as containing 0 unless the Empty cell value is configured to be an error. If the Empty cell value is configured to be an error, the cell is flagged with the error message, `Reference to undefined cell`.

Related functions

STDEV

EXP(number)

The number e raised to the power number.

Result

The exponential power of the argument.

Example

```
EXP(1)= 2.718281828
```

Comments

The argument must be less than or equal to 300. EXP is the inverse of LN, the natural logarithm of number.

Related functions

LN returns the natural logarithm (inverse of the EXP function). LOG returns the logarithm of a number in base 10.

FIND(string1,string2)

Finds the occurrence of one string in another.

Result

This function looks for an occurrence of string2 in string1. If it finds one, it produces the index of the first matching character in string1. Otherwise it produces -1, meaning string2 does not occur in string1.

If there are multiple occurrences, only the first one is found.

Examples

```
FIND("Transylvania", "syl") = 5
FIND("LOGARITHM", "LN") = -1
FIND("Colin Ross Malone", "Ro") = 7
```

Comments

If string2 is supplied as a null string, then it always returns 1.

FLOOR(number)

The largest integer less than or equal to a `number`.

Result

The largest integer less than or equal to the argument

Examples

```
FLOOR(4.7) = 4
FLOOR(-5.9)= -6
```

Comments

Equivalent to `INT`.

Related functions

`CEIL` returns the smallest integer greater than or equal to `number`.

GAUSS(number1,number2)

Returns a random number with gaussian distribution.

Result

A random number with gaussian distribution, mean x and standard deviation y.

Examples

```
GAUSS(10,2)= 7.32456
GAUSS(10,2)= 10.21407
```

Related functions

`RAND` – reinitialising the random number generator.

HOURS(temporal)

Returns a number corresponding to an hour of the day. The temporal value is the number of seconds since 0BC.

Result

A number which gives the hour of the given time in the range 0 – 23.

Example

```
HOURS(62786932984)= 14
HOURS(NOW())
```

Related functions

The temporal functions are: TIME, YEARS, MONTHS, DAYS, HOURS, MINUTES, SECONDS, DAYNUMBER, YEARADD and MONTHADD. Other related functions are TTIME, NOW and DAYNUMBER.

INT(number)

The largest integer less than or equal to a number.

Result

The largest integer less than or equal to the argument.

Examples

```
INT(4.7) = 4
INT(-5.9)=-6
```

Comments

Equivalent to FLOOR.

Related functions

CEIL returns the smallest integer greater than or equal to number.

LEFT(string,number)

Returns the specified number of left-most characters in string.

Argument

A string and a positive number (say n).

Result

A string which contains the n left-most characters of the first argument, or the whole of the first argument if it is fewer than n characters long.

Examples

```
LEFT("Archimedes",4) = "Arch"
LEFT("Archimedes",50)= "Archimedes"
```

Comments

In the special case of `number = 0`, a null string is returned.

Related functions

`RIGHT` extracts the right-most characters from a text string. Both `LEFT` and `RIGHT` are special cases of `MID`, which extracts characters from any part of a string.

LEN(string)

Gives the number of characters in a `string`.

Result

An integer which gives you the number of characters in a string.

Example

```
LEN("horse")= 5
```

Comment

If you supply the reference to an undefined cell as the argument, you get a value of one (assuming Empty cell format is set to zero), since LEN("0") = 1.

LN(number)

Returns the natural logarithm of `number`.

Result

The natural logarithm (log to the base e) of the argument.

Examples

```
LN(1) = 0
LN(0.03)= -3.50656
```

Restriction

The argument must be a positive number.

Related functions

`EXP` returns e raised to a given power (the inverse of `LN`). `LOG` returns the base 10 logarithm of a number.

LOG(number)

Returns the base 10 logarithm of `number`.

Result

The common logarithm (log to the base 10) of the argument.

Examples

```
LOG(1) = 0
LOG(0.03)= -1.52288
```

Related functions

`LN` returns the natural logarithm of `number`.

LOWER(string)

Changes upper case `string` to lower case.

Result

Turns every upper case letter in a string into lower case.

Example

```
LOWER("ACORN")= "acorn"
LOWER("George")= "george"
```

Related functions

The function `UPPER` changes strings to upper case.

MAX(block)

Returns the value of the largest defined element in the `block`.

Result

The value of the largest element.

Example

```
MAX(A1><Z99)
```

Comment

Blank or empty cells in the block are treated as containing 0 unless the Empty cell value is configured to be an error. If the Empty cell value is configured to be an error, the cell is flagged with the error message, `Reference to undefined cell`.

Related functions

MIN returns the smallest element.

MID(String, start number, finish number)

Extracts characters from any part of a string.

Result

Normally a string, at least one character long, which starts at character p of the string argument and continues to character q. (Character counting starts at 1).

However, there are several special cases:

- If p > q, their values are interchanged.
- If p = 0, the result starts at the first character of the input string.
- If q is greater than the length of the string, the result stops at the end of the input string.

Examples

```
MID("Archimedes",3,7) = "chime"
MID("Archimedes",3,3) = "c"
MID("Archimedes",8,4) = "himed"
MID("Archimedes",7,30)= "edes"
MID("Archimedes",0,4) = "Arch"
```

Possible errors

The message `Argument must be positive` is given for arguments that are out of range.

Comments

This function **does not** operate in the same way as the BBC BASIC `MID$` function.

If p is greater than the length of the string then the result string starts (and ends) with the last character.

In the special case of q=0, a null string is returned.

Related functions

`RIGHT` extracts the right-most characters from a text string. `LEFT` extracts the left-most characters from a text string.

MIN(block)

Returns the value of the smallest defined element in the `block`.

Result

The value of the smallest element.

Example

```
MIN(C5><D12)
```

Comment

Blank or empty cells in the block are treated as containing 0 unless the Empty cell value is configured to be an error. If the Empty cell value is configured to be an error, the cell is flagged with the error message, `Reference to undefined cell`.

Related functions

MAX returns the largest element.

MINUTES(temporal)

Returns the minute number contained in a temporal value. The temporal value is the number of seconds since 0BC.

Result

A number which gives the minute of the given time in the range 0 – 59.

Example

```
MINUTES(62786932984)=43
MINUTES(NOW())
```

Related functions

The temporal functions are: TIME, YEARS, MONTHS, DAYS, HOURS, MINUTES, SECONDS, DAYNUMBER, YEARADD and MONTHADD.

TTIME takes a date and time as an argument and returns the corresponding temporal value. NOW returns a temporal value corresponding to the date and time of the system clock.

MONTHADD(temporal)

Adds one month to the temporal value. The temporal value is the number of seconds since 0BC.

Result

A temporal value exactly one month later, except that when a date at the end of a long month is advanced to a shorter month, the last day of that month is taken. For example, MONTHADD applied to January 31st would give February 28th or February 29th in a leap year.

Note: to generate a sequence of the last days in each month, use MONTHADD on the first day and then subtract one day (24 x 60 x 60 seconds).

Related functions

The temporal functions are: TIME, YEARS, MONTHS, DAYS, HOURS, MINUTES, SECONDS, DAYNUMBER, YEARADD and MONTHADD.

TTIME takes a date and time as an argument and returns the corresponding temporal value. NOW returns a temporal value corresponding to the date and time of the system clock.

MONTHS(temporal)

Returns a number corresponding to the month. The temporal value is the number of seconds since 0BC.

Result

A number which gives the month of the given time, in the range 1 – 12.

Example

```
MONTHS(62786932984)= 10 (October)
```

Related functions

The temporal functions are: TIME, YEARS, MONTHS, DAYS, HOURS, MINUTES, SECONDS, DAYNUMBER, YEARADD and MONTHADD.

TTIME takes a date and time as an argument and returns the corresponding temporal value. NOW returns a temporal value corresponding to the date and time of the system clock. See also MONTHADD.

NOW()

Generates a temporal value which represents the current data and time. The temporal value is the number of seconds since 0BC.

Examples

```
NOW()= 67438384665
YEARS(NOW())= 1990
MONTHS(NOW())= 2
```

Comment

The function brackets are required even though the function takes no arguments.

Related functions

The function TTIME returns the temporal value of any given time and date.

Functions that use temporal values to return dates and times are: TIME, YEARS, MONTHS, DAYS, DAYNUMBER, HOURS, MINUTES and SECONDS.

PRODUCT(block)

Multiplies together all defined elements of the `block`.

Result

The product of all the elements when multiplied together.

Examples

```
PRODUCT(A1><H6)
```

Comments

If any cell in the block contains a zero or non-numeric text, the result will be zero.

Blank or empty cells in the block are treated as containing 0 unless the Empty cell value is configured to be an error. If the Empty cell value is configured to be an error, the cell is flagged with the error message, `Reference to undefined cell`.

Related functions

`AVERAGE` averages its arguments. `SUM` adds its arguments together. `COUNT` counts the number of non-zero arguments.

RAD(number)

Converts number (in degrees) to radians.

Result

The equivalent of the argument in radians.

Examples

```
RAD(1.5)= 0.026180 rad
```

Comments

The argument is taken to be in degrees (always).

Related functions

DEG converts number in radians to degrees.

RAND(number)

Returns a random number.

Result

A random number with rectangular distribution, in the range between 0 and the argument.

Examples

```
RAND(36)= 12.5457
```

Comments

A new random number is calculated each time the spreadsheet is recalculated.

When Advance is started, the random number seed is always preset to the same value, so that the sequence of random numbers during any run will normally be the same. However the seed may be reset to a new and unpredictable value (which depends on data and time) by calling RAND with an argument of 0 (zero).

The same random number generator is used for both RAND and GAUSS.

RIGHT(string,number)

Returns the specified `number` of right-most characters in `string`.

Argument

A string and a positive number (say n).

Result

A string which contains the n right-most characters of the first argument, or the whole of the first argument if it is fewer than n characters long.

Examples

```
RIGHT("Archimedes",5 )= "medes"
RIGHT("Archimedes",50)= "Archimedes"
```

Related functions

`LEFT` extracts the left-most characters from a text string. Both `LEFT` and `RIGHT` are special cases of `MID`, which extracts characters from any part of a string.

ROUND(number,integer)

Returns the number argument rounded to the number of decimal places indicated by the integer.

Examples

```
ROUND(4.73,0) = 5
ROUND(4.73,1) = 4.7
ROUND(-5.69,1)= -5.7
```

Comments

The format of the results given are subject to the current style setting.

SECONDS(temporal)

Returns the second number contained in a temporal value. The temporal value is the number of seconds since 0BC.

Result

A number which gives the second of the given time in the range 0 – 59.

Example

```
SECONDS(62786932984)= 4
```

Related functions

The temporal functions are: `TIME`, `YEARS`, `MONTHS`, `DAYS`, `DAYNUMBER`, `HOURS`, `MINUTES`, `SECONDS`, `YEARADD` and `MONTHADD`.

`TTIME` takes a date and time as an argument and returns the corresponding temporal value. `NOW` returns a temporal value corresponding to the date and time of the system clock.

SIGN(number or string)

Returns the sign of the number or string.

Result

–1 if the argument is negative
+1 if the argument is positive (non-zero)
0 if the argument is zero.

Examples

```
SIGN(-3.4)= -1
SIGN(46)= 1
SIGN("Help")= 0
SIGN("text")= 0
SIGN("2X")= 1
```

Related functions

ABS returns the absolute value of a number.

SIN(number)

Returns the sine of number.

Result

The sine of the argument.

Examples

```
SIN(0)= 0                  argument in degrees
SIN(45)= 0.707107          argument in degrees
SIN(45)= 0.8509            argument in radians
```

Comments

The argument is taken to be in radians if the 'radians' mode is on; otherwise degrees.

Related functions

ASIN returns the arc-sine of a number.

SINH(number)

Returns the hyperbolic sine of number.

Result

The hyperbolic sine of the argument.

Examples

```
SINH(0) = 0                argument in degrees
SINH(45)= 0.868671         argument in degrees
```

Comments

The argument is taken to be in radians if the 'radians' mode is on; otherwise degrees.

The argument (in radians) must be less than or equal to 300.

SQRT(number)

Returns the square root of `number`.

Result

The square root of the argument.

Restriction

The argument must be positive.

Examples

```
SQRT(0)= 0
SQRT(170)= 13.03840
```

Related functions

`EXP` raises a number to a power.

STDEV(block)

Gives the standard deviation of all the defined elements in the block.

Result

The standard deviation of all the elements.

Examples

```
STDEV(A1><Q6)
```

Comments

The term standard deviation is used with two slightly different meanings. Sometimes it is taken to mean 'The square root of the variance of all the elements of the set'. At other times it refers to 'the best estimate of the standard deviation of the parent population from which samples are taken'. The two version have slightly different values; the estimate is always larger by a factor of $(\sqrt{(n/n-1)})$, where n is the number of elements in the set.

STDEV gives the standard deviation of the elements in the set. ESTDEV gives the estimated standard deviation of the mean.

Blank or empty cells in the block are treated as containing 0 unless the Empty cell value is configured to be an error. If the Empty cell value is configured to be an error, the cell is flagged with the error message, `Reference to undefined cell`.

Related functions

ESTDEV gives the best estimated standard deviation of the parent population.

SUM(block)

Returns the arithmetic sum of items in block.

Result

The sum of all the elements.

Examples

```
SUM(A1><Q8)
```

Comment

Blank or empty cells in the block are ignored unless the Empty cell value is configured to be an error. If the Empty cell value is configured to be an error, the cell is flagged with the error message, `Reference to undefined cell`.

Related functions

`AVERAGE` averages its arguments. `PRODUCT` multiplies its arguments together. `COUNT` counts the number of non-zero arguments.

TAN(number)

Returns the tangent of number.

Result

The tangent of the argument.

Examples

```
TAN(13.4) = 0.238234      argument in degrees
TAN(13.4) = 1.1043        argument in radians
TAN(-66.2)= -2.267304     argument in degrees
```

Comments

The argument is measured in radians if 'radians' mode is on; otherwise degrees.

Related functions

`ATAN` returns the arc-tangent of a number.

TANH(number)

Returns the hyperbolic tangent of number.

Result

The hyperbolic tangent of the argument.

Examples

```
TANH(0) = 0               argument in degrees
TANH(45)= 0.65579         argument in degrees
```

Comments

The argument is taken to be in radians if the 'radians' mode is on; otherwise degrees.

TIME(temporal)

Returns the date and time equivalent to a temporal value. The temporal value is the number of seconds since 0BC.

Result

A string in the form (–)yyyy/mm/dd/hh/mm/ss where (–)yyyy is the year. A minus sign implies BC.

mm is the month, in the range 01 – 12
dd is the day, in the range 01 – 31
hh is the hour, in the range 00 – 23
mm is the minute in the range 00 – 59
ss is the second, in the range 00 – 59.

Example

```
TIME(62786932984)= 1989/10/20/14/43/04
```

Comment

To get the correct time format in your spreadsheet, it may be easier to use one of the other temporal functions to produce a temporal number, and then convert that number to a recognisable date and time using Number format.

Related functions

The temporal functions are: `TIME`, `YEARS`, `MONTHS`, `DAYS`, `DAYNUMBER`, `HOURS`, `MINUTES`, `SECONDS`, `YEARADD` and `MONTHADD`.

`TTIME` takes a date and time as an argument and returns the corresponding temporal value. `NOW` returns a temporal value corresponding to the date and time of the system clock.

TTIME(year,month,day,hour,minute,second)

Returns the temporal equivalent of the given date and time. The temporal value is the number of seconds since 0BC.

Argument

Six numbers which give a year, a month, a day, an hour, a number of minutes, and a number of seconds.

Month must be 01–12
Day must be 01–31
(both these are error-checked and give an error message if wrong numbers are entered).

Hours, minutes and seconds can be >60 or >24 and will be evaluated correctly. All numbers (except year) must be positive.

Result

The temporal value which corresponds to the arguments.

Example

```
TTIME(1989,10,20,14,43,4)= 62786932984
```

Related functions

The temporal functions are: TIME, YEARS, MONTHS, DAYS, DAYNUMBER, HOURS, MINUTES, SECONDS, YEARADD and MONTHADD.

NOW returns a temporal value corresponding to the date and time of the system clock.

UPPER(string)

Changes lower case string to upper case.

Result

Turns every lower case letter in a string into upper case.

Example

```
UPPER("Acorn")= "ACORN"
UPPER("1960")= "1960"
```

Related functions

The function LOWER changes strings to lower case.

YEARADD(temporal)

Adds one year to the temporal value. The temporal value is the number of seconds since 0BC.

Result

A temporal value exactly one year later, except when an initial date of February 29th will yield February 28th in the following year.

Related functions

The temporal functions are: `TIME`, `YEARS`, `MONTHS`, `DAYS`, `DAYNUMBER`, `HOURS`, `MINUTES`, `SECONDS`, `YEARADD` and `MONTHADD`.

`NOW` returns a temporal value corresponding to the date and time of the system clock. `TTIME` takes a date and time as an argument and returns the corresponding temporal value. See also `MONTHADD`.

YEARS(temporal)

Returns a number corresponding to the year. The temporal value is the number of seconds since 0BC.

Result

A number which gives the year of the given time.

Examples

```
YEARS(62786932984)= 1989
```

Related functions

The temporal functions are: `TIME`, `YEARS`, `MONTHS`, `DAYS`, `DAYNUMBER`, `HOURS`, `MINUTES`, `SECONDS`, `YEARADD` and `MONTHADD`.

`NOW` returns a temporal value corresponding to the date and time of the system clock. `TTIME` takes a date and time as an argument and returns the corresponding temporal value.

Appendix H: Character sets

The ISO Latin1 character set

This is the character set used in Advance with text fonts such as Trinity and Homerton. Use a character's ASCII number to indicate it in **Find/Replace**; hold down Alt and type the number on the numeric keypad to enter it from the keyboard.

33	!	58	:	83	S	108	l	142	‰
34	"	59	;	84	T	109	m	143	•
35	#	60	<	85	U	110	n	144	‘
36	$	61	=	86	V	111	o	145	’
37	%	62	>	87	W	112	p	146	‹
38	&	63	?	88	X	113	q	147	›
39	'	64	@	89	Y	114	r	148	“
40	(	65	A	90	Z	115	s	149	”
41	)	66	B	91	[	116	t	150	„
42	*	67	C	92	\	117	u	151	–
43	+	68	D	93	]	118	v	152	—
44	,	69	E	94	^	119	w	153	–
45	-	70	F	95	_	120	x	154	Œ
46	.	71	G	96	`	121	y	155	œ
47	/	72	H	97	a	122	z	156	†
48	0	73	I	98	b	123	{	157	‡
49	1	74	J	99	c	124	l	158	fi
50	2	75	K	100	d	125	}	159	fl
51	3	76	L	101	e	126	~	160	
52	4	77	M	102	f	129	Ŵ	161	¡
53	5	78	N	103	g	130	ŵ	162	¢
54	6	79	O	104	h	133	Ŷ	163	£
55	7	80	P	105	i	134	ŷ	164	¤
56	8	81	Q	106	j	140	…	165	¥
57	9	82	R	107	k	141	™	166	¦

167	§	192	À	217	Ù	242	ò
168	¨	193	Á	218	Ú	243	ó
169	©	194	Â	219	Û	244	ô
170	ª	195	Ã	220	Ü	245	õ
171	«	196	Ä	221	Ý	246	ö
172	¬	197	Å	222	Þ	247	÷
173	-	198	Æ	223	ß	248	ø
174	®	199	Ç	224	à	249	ù
175	¯	200	È	225	á	250	ú
176	°	201	É	226	â	251	û
177	±	202	Ê	227	ã	252	ü
178	²	203	Ë	228	ä	253	ý
179	³	204	Ì	229	å	254	þ
180	´	205	Í	230	æ	255	ÿ
181	µ	206	Î	231	ç		
182	¶	207	Ï	232	è		
183	·	208	Ð	233	é		
184	¸	209	Ñ	234	ê		
185	¹	210	Ò	235	ë		
186	º	211	Ó	236	ì		
187	»	212	Ô	237	í		
188	¼	213	Õ	238	î		
189	½	214	Ö	239	ï		
190	¾	215	×	240	ð		
191	¿	216	Ø	241	ñ		

The Selwyn character set

This is the character set used with the Selwyn font. Hold down Alt and type the number of the character on the numeric keypad to enter it from the keyboard.

✁	33	✦	70	❒	103	⓾	181
✂	34	✧	71	❑	104	❶	182
✁	35	★	101	❒	105	❷	183
✂	36	☆	73	▲	115	❸	184
☎	97	✪	74	▼	116	❹	185
✇	39	✯	76	◆	106	❺	186
✉	41	✭	77	❖	118	❻	187
☛	42	✰	80	◗	119	❼	188
☞	43	✱	81	|	120	❽	189
✍	45	✲	91	▌	121	❾	190
✓	51	✲	92	▮	122	❿	191
✔	98	✻	102	♣	168	→	213
✕	53	✾	94	♦	169	↔	214
✖	54	✿	95	♥	170	↕	215
✘	99	❀	96	♠	171	↘	216
✙	57	❁	37	①	172	→	217
✚	58	❄	100	②	173	↗	218
✛	59	❄	72	③	174	➔	220
✜	60	❇	114	④	175	➢	226
✝	61	✳	231	⑤	176	➢	227
✞	62	●	108	⑥	177	➤	228
✟	63	○	109	⑦	178	➡	229
✠	64	■	110	⑧	179	➡	230
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Acorn Advance User Guide

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