User Manual

Financial Times Software

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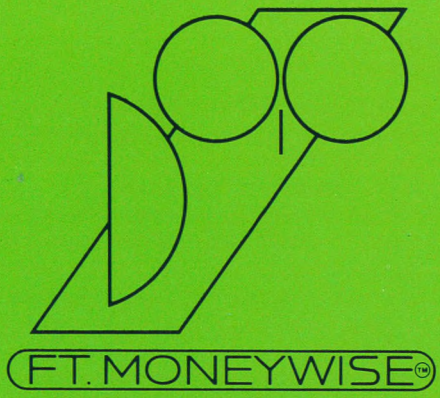

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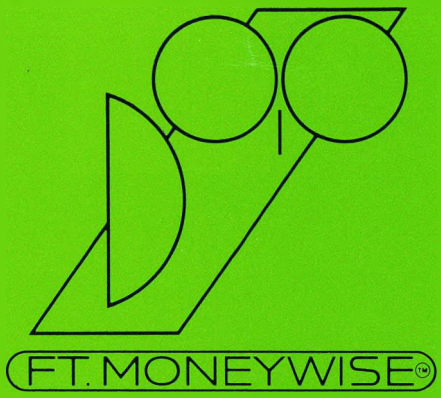


1

Introduction

The System

1.1

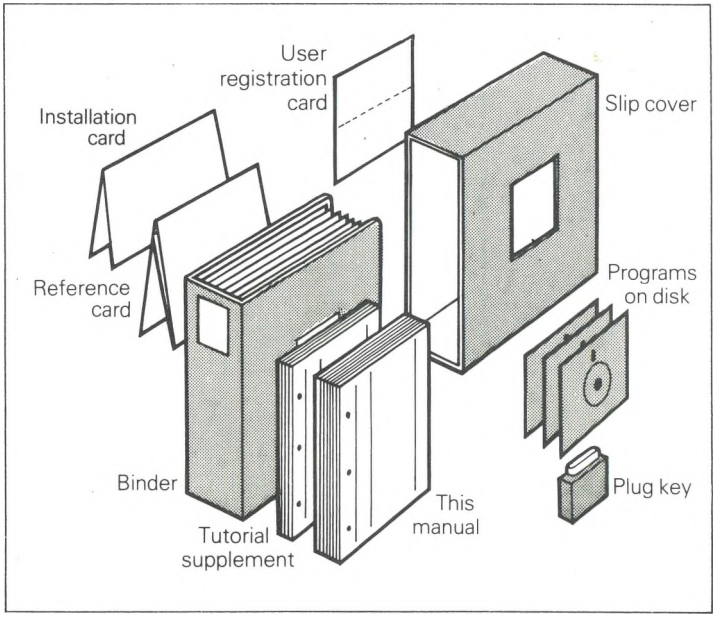
This manual explains how to use the MONEYWISE system.

Conceptually the system is a tool for compiling accountants' reports, company forecasts, economic reports, domestic budgets, financial proposals, and other such analyses and reports. Physically the system comprises :

- a floppy disk (for some Computers – two disks) with programs of instructions to a computer. Under control of these programs the computer becomes a device which can communicate in words, figures and pictures via keyboard and screen
- a plug key or disk key to fit a socket or disk drive on the computer. Unless the key is in place the system is limited in its use.
- this manual
- an installation card explaining how to install the system on your computer
- a reference card relating your keyboard to Moneywise
- a tutorial supplement and disk with graded examples to help get started.

The physical components of MONEYWISE are depicted in fig. 1.1. The conceptual components are explained in this manual.

FIG. 1.1 PHYSICAL COMPONENTS OF MONEYWISE



1.2 Moneyprints

The physical product of the system is the moneyprint.

A moneyprint comprises tables of figures and graphs describing a company forecast, economic report, domestic budget, financial proposal, or other such report of a financial nature.

A typical moneyprint comprises :

- distinctive cover sheet with title, date and time
- contents page
- key page showing how the various sets of figures were derived
- several pages of figures, neatly tabulated and headed, being the financial data for the report
- plotted graphs, pie charts, bar graphs (histograms) to display significant aspects and conclusions
- tabular results (tables set out according to special house styles if desired) of balance sheets, cash flows, and so on.

The term 'moneyprint' has been coined because this product is so much more than the management report available from

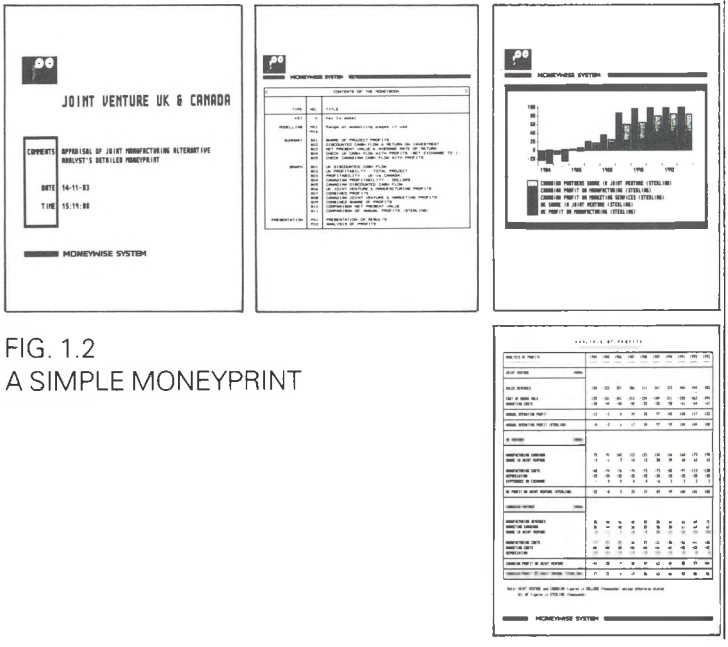


FIG. 1.2
A SIMPLE MONEYPRINT

conventional modelling systems.

It is not necessary to hand a moneyprint to a typist, or its graph pages to a draughtsman, because moneyprints are produced to boardroom standards of presentation, direct from the computer and printer.

Fig. 1.2 is a diagrammatic representation of a very simple moneyprint.

Moneybooks

1.3

A moneyprint may be brief – no more than a single page balance sheet – whereas the figures needed to derive it may originally have occupied many type-written pages.

Conceptually a *page* exists inside the computer too. A page in the computer may be displayed on the screen. The page may have more lines than the screen can accommodate but by scrolling up and down every line may be seen.

Original data are typed into *modelling pages*. On modelling pages columns of raw data may be combined in different ways to form other columns. Manipulation and transformation of columns of figures is an essential part of financial modelling; hence the term 'modelling page'.

From modelling pages, *summary pages* may be abstracted. Similarly graphs may be drawn on *graph pages*. And attractive layouts may be specified on *presentation pages*.

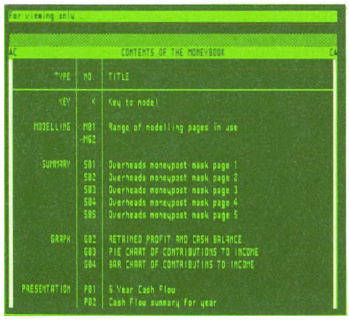
The system keeps track of all such pages on a *contents page* and of every column and every modelling page in a *key page*.

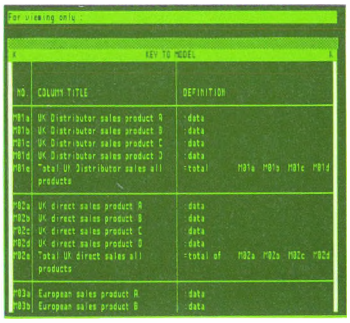
A totality of such pages – contents page, key page, layout pages, graph pages, summary pages, modelling pages – is called a *moneybook*. A moneyprint is simply a selection of pages from a moneybook.

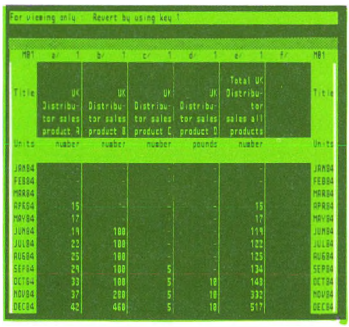
The moneybook currently in the computer's memory is called the *open moneybook*. Copies of it may be filed as explained later.

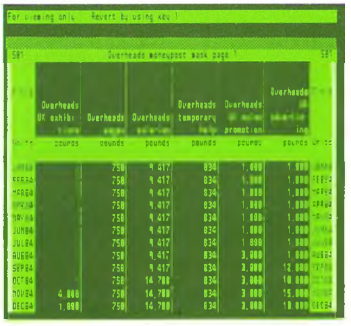
A typical moneybook is depicted in fig. 1.3.

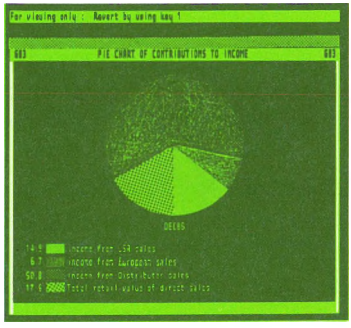
FIG 1.3
CONCEPT OF A MONEYBOOK

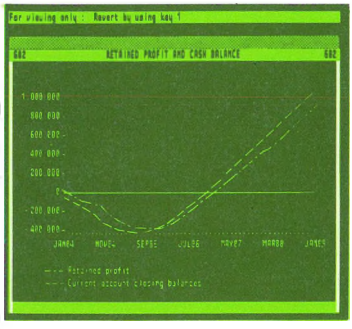


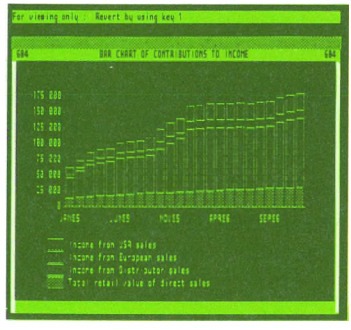


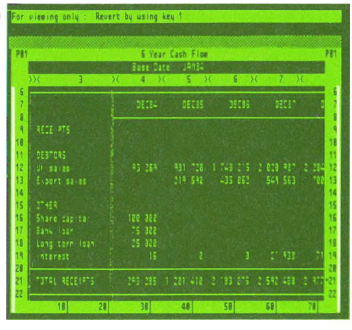












Moneyposts

It is possible to transfer information electronically from one moneybook to another by means of the *moneypost*. Head office, for example, might maintain a moneybook for the whole company; moneyposts would arrive each week – by floppy disk or direct communication between computers – with pages from the moneybooks maintained by the various branch offices.

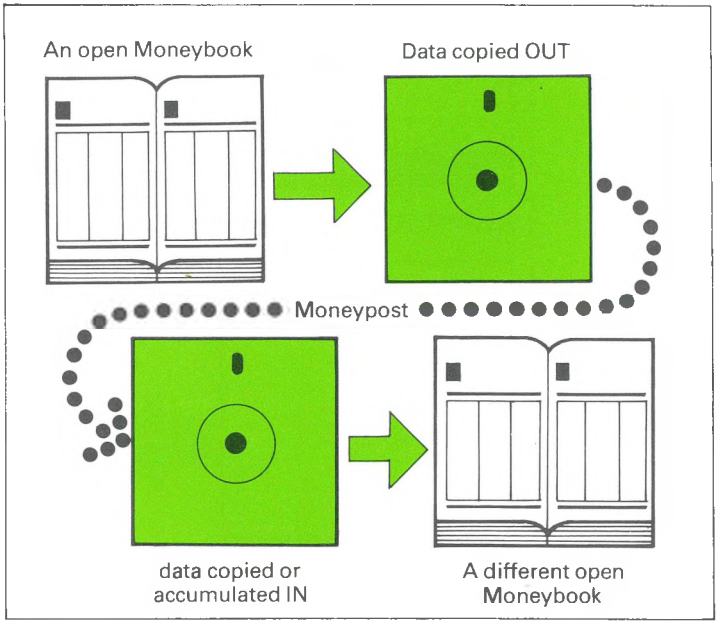
A moneypost is a collection of information from a moneybook transferred to a disk. Subsequently a different moneybook may be opened (on the same or another computer) and the information in the moneypost transferred to it.

When a moneypost is received, the data contained may be consolidated in the open moneybook. Accumulation is possible when there are several branch offices posting returns which are to be summed.

The disk used for a moneypost may hold several other moneyposts and possibly one or more complete moneybooks as well.

The concept of the moneypost is depicted in fig. 1.4.

FIG. 1.4
CONCEPT OF THE MONEYPOST



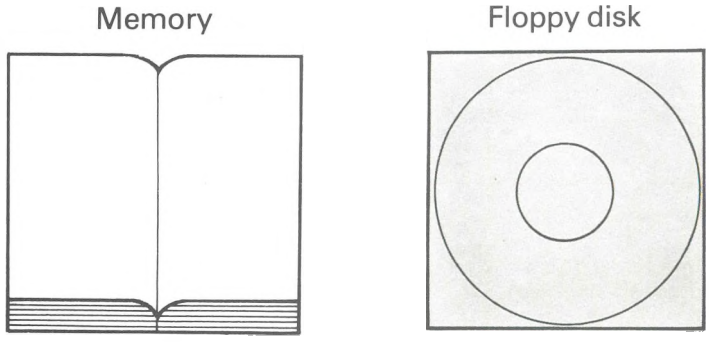
1.5 Files

Moneyprints, moneybooks and moneyposts may be stored on disks as *files*. Floppy disks provide a cheap medium of storage; even a single floppy disk may store several moneybooks. And the floppy disk is the medium of transport of moneyposts from one installation to another.

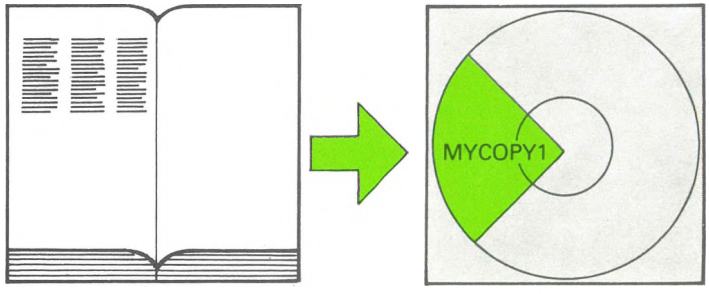
Every file is given a unique name by which to retrieve it. The screen is easily made to display a list of names of all files stored on a disk.

When opening a new (empty) moneybook no file is involved. The moneybook is opened in the computer's memory as depicted in fig.1.5(a). After some work has been done a copy of the open moneybook may be stored on disk as a file (named, say, MYCOPY1) as depicted in (b). Then, after some more work has been done on the open moneybook, another copy may be stored as a file (named, say, MYCOPY2) as depicted in (c).

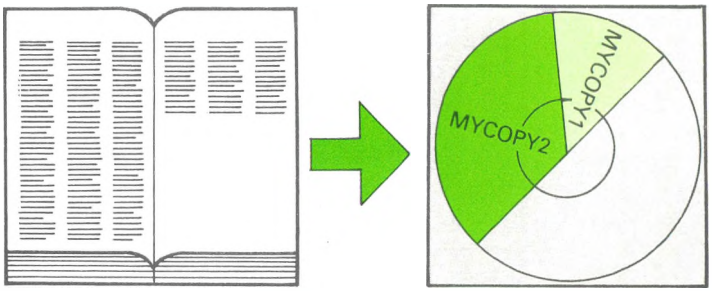
FIG. 1.5
FILING THE OPEN MONEYBOOK



(a) Opening a new moneybook



(b) Filing copy of the open moneybook



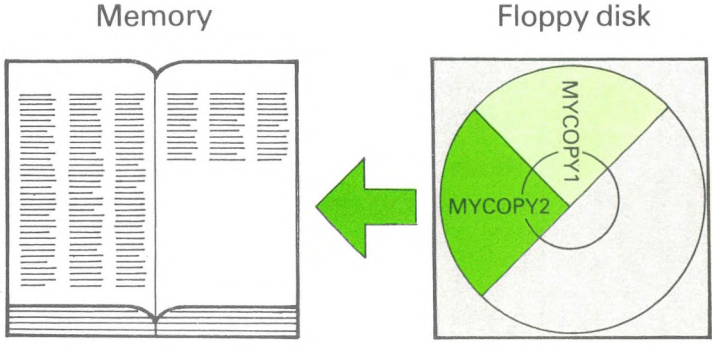
(c) Filing another copy

If the computer were now switched off, the open moneybook in the computer's memory would evaporate. But there would be two copies on disk, MYCOPY1 and MYCOPY2, having been taken at different stages of development of the financial model.

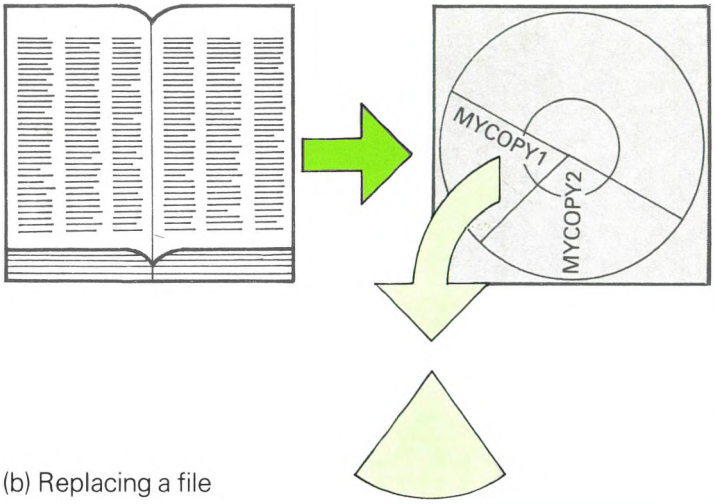
On returning to the computer there would be no open moneybook; one has to be opened. A new one could be opened as depicted in fig. 1.5 (a). Or a disk file could be retrieved and a copy of it sent to the computer's memory as the open moneybook. The retrieval of the file named MYCOPY2 is depicted in fig. 1.6 (a).

After some work has been done a copy of the open moneybook could be filed as illustrated in fig. 1.5 (b) and (c). This time the name might be MYCOPY3.

FIG. 1.6
RETRIEVING & REPLACING FILES



(a) Retrieving a file



(b) Replacing a file

But suppose the new file were given the name MYCOPY1 instead of MYCOPY3. Then, instead of a third copy being filed on the disk, the original version of MYCOPY1 would be wiped out and replaced by a copy of the open moneybook as illustrated in fig. 1.6 (b).

MYCOPY1, MYCOPY2, MYCOPY3 are examples of file names. A file name is limited to eight letters and digits; it is not much use for describing the contents of the file it names. For that purpose every file is given a *title*. The title may be longer than the name; up to fifty-one characters including spaces.

To keep track of files on a disk a facility is provided for listing file names together with titles. As a further help, when any file is retrieved (by name) from disk, the title of that file is displayed on the screen for verification. Conversely, the system refuses to save any information as a file until a title has been given. In summary, file names are for saving and retrieving: titles are displayed during these operations and briefly describe the contents of nominated files. For example :

file name: **MYCOPY2**

title: **MODEL OF INVESTMENT PROJECT, PHASE II**

Keyboards

1.6

The system is controlled from a keyboard. Apart from switching the equipment on and off, inserting and extracting disks, opening and closing doors to disk drives, all control is achieved by pressing the keys of the keyboard.

The keyboard resembles that of an electric typewriter. The alphabet is arranged in conventional QWERTY form. Digits 0 to 9 are in the row of keys above the alphabet, but a separate number pad (arranged as on a calculator) is usually provided too. Letter O should not be used to signify zero, nor letter I to signify unity.

Shift keys, shift lock, and space bar work as on an electric typewriter.

So typing text such as a column title (e.g. Cost per Dozen) or a number (e.g. 37.50) needs no further explanation.

Other control keys differ in position among keyboards capable of controlling the system. Furthermore the names engraved on such keys differ from keyboard to keyboard. So it is impossible,in a general manual, to explain how to control the system in terms of particular engravings. Instead, control keys are referred to by general names. These general names are printed on the special labels provided which may be fixed to your keys if desired.

For example there is always a key on an electric typewriter for starting the next line of typescript. This key is often larger than the others or may have a distinctive shape. It may have the word RETURN or a special arrow symbol engraved on it. In this manual it is referred to as **return**.

These general names (e.g. **return**) are printed in small letters in this manual. The small letters serve as a warning that the same name is not necessarily engraved on a key. The reference card shows all the general names and relates them to control keys and their location on the keyboard.

Getting Started

1.7

The procedure for installing the system cannot be described in this manual because it differs according to the make and model of computer being used. Installation is described on the installation card supplied with the system.

Once installed, the system may be switched on and started

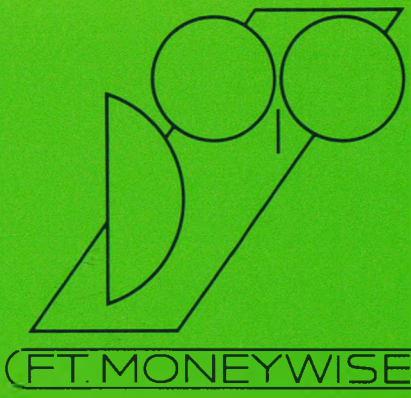
according to instructions on the reference card supplied with the system.

There are three concepts defined on the reference card which are essential to starting and running the system. Special terminology is used :

■ *the start-up position* : the disposition of disks when starting (which disk on which drive)

■ *the start-up drive* : the identity of a certain disk drive (the identity code must be typed in front of :MW every time there is a re-start)

■ *the moneyfile drive* : the disk drive which is to contain the moneyfile disk (a moneyfile disk is one containing filed moneybooks, moneyposts, moneyprints).



2

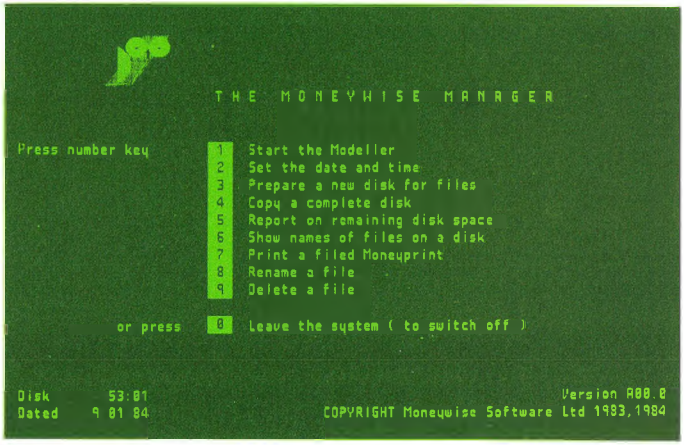
The Manager

The Manager

2

The Manager is the program that comes to life when the system is started according to the instructions on the reference card. It is controlled by number keys 0 to 9. This chapter explains what would happen on pressing each of these keys.

FIG. 2.1
SCREEN DISPLAYED BY THE MANAGER



Management Services

2.1

The Manager offers various management services such as setting the clock in the computer to the correct date and time, preparing a floppy disk to receive files (every new disk just taken from its wrapper must be so prepared) or making a security copy of a disk already containing files.

The most commonly used management service, however, is the one to leave the Manager and enter the Modeller. The Modeller is the main program of the system; indeed the remainder of the manual (after this chapter) is about using the Modeller.

Management services other than those briefly referred to above need not concern the novice. Nevertheless, the full range of management services is described in this chapter because this is a reference manual rather than a primer. First-time readers may care to skip the description of management services 5 to 9 inclusive.
On leaving the Modeller there is an automatic return to the Manager (being in control when one enters or leaves the

system). To leave the Manager prior to switching off the equipment it is necessary to press number key 0.

The Manager's screen is shown in fig. 2.1.

The implication of pressing each of the number keys 1 to 9 is separately described below.

2.2 Leave the System

Press number key 0.

After pressing this key when the Manager is in control the equipment may be switched off.

2.3 Start The Modeller

Press number key 1.

The Modeller is the main program of the system; most of this manual is devoted to its use.

Before pressing the key ensure the disks and plug key are in the start-up position described on the reference card and that the doors to the disk drives are shut.

After typing 1 the Modeller takes control from the Manager.

2.4 Set Date and Time

Press number key 2.

The computer has a clock which records both date and time; switching off, with most models of computer, interrupts the setting. This clock may be checked and reset if necessary as described below.

Recorded with every file is the date and time of its creation or replacement. To see a list of names of files, together with their dates and times of creation, use facility 6.

The date and time of production are also recorded on the cover sheet of each moneyprint. Fig. 1.2 shows such a cover sheet.

On typing 2 the screen displays, for example :

```
Current date setting is 04-10-83
Enter new date setting :
```

The form of date is two digits for the day – two for the month – two for the year, separated by minus signs. So the above example says 4th October 1983.

If the date displayed is correct it is not necessary to retype it; just press **return**. Otherwise type the date in the form described, then press **return**. A wrong date may be corrected by pressing **left** and overtyping before pressing **return**.

In the event of a wrong date being entered press **leave** and repeat the process correctly.

Assuming a correct date has been accepted the screen now displays, for example :

```
Current time setting is 15:01:07
Enter new time setting :
```

The form for time is two digits for the hours on a 24-hour clock : two digits for the minutes : optionally two digits for the seconds. The example shows one minute and seven seconds past three p.m. (an example without seconds being 15:02).

If the time displayed is correct it is not necessary to retype it; just press **return**. Otherwise type the time in the form described – a little ahead of the moment – and hit **return** as the moment arrives.

A wrong time may be corrected by pressing **left** and overtyping before pressing **return**. If the time successfully entered proves to be wrong, the whole procedure should be run through again.

Prepare a New Disk for Files

Press number key 3. **2.5**

A disk cannot hold files (moneybooks, moneyposts or moneyprints awaiting printing) until it has been prepared.

There is an exception to this rule; a disk may be copied using facility 4 without subjecting the receiving disk to preparation as described here.

After typing 3 certain prompts appear on the screen and should be followed. These prompts issue from the operating system of the computer being used, not from the system described in this manual, so it is impossible to give an accurate example here. However, the prompts may look similar to the imaginary ones illustrated below :

```
Disk on drive A or B ? (press return to abandon)
```

in which A and B indicate the left- and right-hand disk drives respectively. The user has to tell the computer on which drive the disk will be put. Pressing return is a means of escape, causing the Manager's screen to reappear before the disk has been prepared.

After typing letter A or B the screen displays a confirmatory message, for example :

```
Drive A to be used. When ready press space bar
```

It is now time to check that the disk to be prepared (the jargon is 'formatted') is the correct one; that it is put on the correct drive; that the door to the drive is closed. Once the space bar has been pressed preparation begins and cannot be stopped. EVERYTHING FORMERLY ON THE DISK IS LOST FOREVER.

A disk already containing files needs no further preparation. But if such a disk were put through this process all the files on it would be lost.

When preparation is complete the screen typically displays again the invitation to type A or B or press return. Pressing return makes the Manager's screen reappear.

2.6 Copy a Complete Disk

Press number key 4.

The complete contents of one floppy disk are copied to another, leaving the first unaltered. There is no provision for copying selected programs or files. This management service

is intended for copying disks that contain important work so that copies may be stored away from the computer. Disk damage would not then imply loss of files or programs stored on the damaged disk.

This facility is not for copying information stored on a hard disk. For saving such information the vendor of the disk should be consulted.

After typing 4 certain prompts appear on the screen and should be followed. These prompts issue from the operating system so it is impossible to give an accurate example here. However, the prompts should look similar to the imaginary ones illustrated below :

```
Copy from A or copy from B?
(press return to abandon)
```

in which A and B indicate the left- and right-hand disk drives respectively. It is vital to tell the computer on which drive each disk is put. Typing A tells the computer to copy the contents of the disk on drive A onto the disk on drive B. Typing B tells the computer to copy from B to A. Pressing **return** is a means of escape, causing the Manager's screen to reappear before anything has been copied.

After typing letter A or B the screen displays a confirmatory message. For example :

```
About to copy from A to B.
When ready press space bar
```

It is now time to put the correct disk on each drive (or check that they are so placed) and shut the doors. Once the space bar has been pressed copying begins and cannot be stopped. EVERYTHING FORMERLY ON THE RECEIVING DISK IS LOST FOREVER. The receiving disk becomes an identical copy of the other.

When copying is complete the screen typically displays again the invitation to type A or B or press the **return** key. The **return** key makes the Manager's screen reappear.

2.7 Report on Remaining Disk Space

Press number key 5.

This facility is for discovering whether there is enough space left on a disk for filing a moneybook, moneypost or moneyprint.

Disk space is lost if the process of filing is accidentally interrupted. Use of this reporting facility has the effect of reclaiming such lost space prior to the report being displayed.

The disk should be on the moneyfile drive (the reference card describes which drive that is). After typing 5 any reclaimable space is automatically reclaimed. The screen displays :

- information, if any, about processing (this is further discussed below)
- the number of files on the disk
- the space, measured in bytes, occupied by those files
- the space, measured in bytes, now available for more files
- further information generated by the computer's operating system and which may be disregarded.

The appearance of information about processing means the disk is 'corrupt'. This would demand recreating the current disk from back-up disks.

To make the Manager's screen reappear press any key.

2.8 Show Names of Files on Disk

Press number key 6.

It is easy to forget what files are stored on a disk, or forget their titles even if a list of names has been kept. This facility is for displaying on the screen – or printing on paper – the list of names of files stored on a disk together with the titles of those files.

The disk should be on the moneyfile drive.

On typing 6 a prompt appears :

List to be printed ? (y or n)

If the list is not to be printed on paper type n (for no). Otherwise ensure the printer is connected to the computer, and is switched on, before typing y (for yes). The list about to be displayed on the screen would then be printed on paper as well.

The screen displays a list of names of files and their titles. This list may be longer than the screen can show, in which case any key may be pressed to display the next batch.

To make the Manager's screen reappear press **leave**.
Type 6 to start viewing the list from the beginning again.

Print a Filed Moneyprint

2.9

Press number key 7.

A moneyprint may be printed direct from a moneybook or saved as a file on disk for printing subsequently. The facility described here is for carrying out this subsequent printing.

When using this facility the printer currently connected to the computer should be compatible with that for which the moneyprint was intended. This subject is covered in chapter 11.

The printer should be connected to the computer and switched on. Check there is sufficient stationery and that it is lined up to 'top of form'. The disk containing the filed moneyprint should be in the moneyfile drive.

After typing 7 the screen displays :

Enter the name of the filed moneyprint :

Press **return** after typing the name demanded.

When the report has been printed the Manager's screen reappears.

2.10 Rename a File

Press number key 8.

Reasons for wanting to rename a file are discussed in chapter 13. When a file is to be renamed the renaming is usually done under control of the Modeller but the Manager is also capable of doing the job as described below.

After typing 8 the screen displays :

```
Enter name of file to be renamed :
```

Press return after typing the name demanded.

An error message is displayed for a few seconds if the given name does not happen to be the name of a file already on the disk. Then the Manager's screen would reappear. Number key 6 could then be used to find the correct name. But if the given name matched the name of any file on the disk the screen would display :

```
Enter new name :
```

Again, return should be pressed after typing the name demanded.

An error message would be displayed for a few seconds if the given name matched that of any file already on the disk – whether of moneybook, moneypost or moneyprint. Then the Manager's screen would reappear. But if the new name proved to be unique it would be given to the nominated file. Then the Manager's screen would reappear.

2.11 Delete a File

Press number key 9.

Moneybooks tend to multiply, particularly when modelling the probable outcome of several different courses of action. Eventually the moneybooks describing rejected plans would have to be deleted. Similarly moneyposts should be deleted when their information has been received. Moneyprints should be deleted from the disk once printed.

Files may be deleted under control of the Modeller, but the Manager is also capable of doing the job as described below.

After typing 9 the screen displays :

Enter name of file to be deleted :

Press **return** after typing the name demanded.

An error message would be displayed for a few seconds if the given name did not happen to be the name of a file on the disk otherwise the nominated file would be deleted. In either case the Manager's screen would reappear.

3

Mechanics of Control

Mechanics of Control

3

The Modeller is the main program of the system. This chapter is concerned with the mechanics of its control via keyboard and screen.

The keyboard itself is described in 1.6. Keys which have special names, such as **right** and **delete**, are depicted on the reference card. The layout of the screen by the Modeller is illustrated in fig. 3.1.

This chapter explains how to type data, correct mistakes in anything typed, direct data to a particular place on the screen, turn to another page, deal with error messages should they occur. These are some of the mechanics of control.

When using the Modeller it is always possible to get help when uncertain what to type next. The help given is specific to context. This chapter explains how to get help.

The facilities described in this chapter are for controlling the Modeller; the Manager is controlled as described in chapter 2.

Screen Layout

3.1

Whilst the Modeller is in use the screen displays a dividing band as shown in fig. 3.1.

The screen below the dividing band changes in layout according to the work being done. There are four fundamental layouts; an example of each kind is reproduced in fig. 3.1. They are :

Selection: A list of available pages in the moneybook or a list of available services such as opening a moneybook or deleting a file

Service screen: a screen arranged as a pro-forma to be filled in giving details necessary for the service requested

Moneybook page: Filling in pages of open moneybooks is the essence of modelling with Moneywise

Help: one or more paragraphs of guidance displayed for as long as the **help** key is held down.

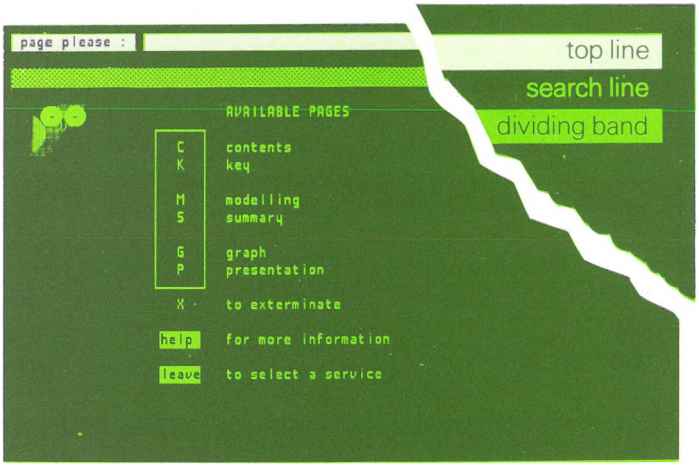
The top line of the screen is the channel of communication;

data typed on the keyboard appear at the top of the screen – where they may be corrected if wrongly typed – before being sent to their place on the screen.

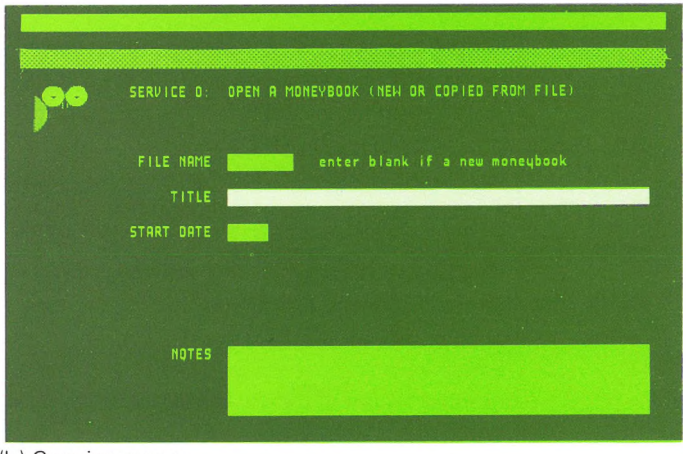
The second line is called the search line. The result of a moneysearch is held there. For example the program may seek out those columns whose titles contain the word 'tax'. Numbers of these columns are displayed in the search line.

Use of the top line and search line is explained in detail below.

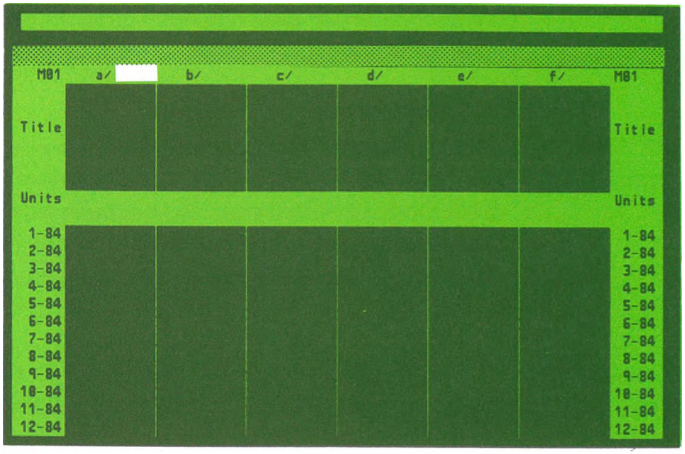
FIG. 3.1
EXAMPLES OF THE FOUR KINDS OF LAYOUT



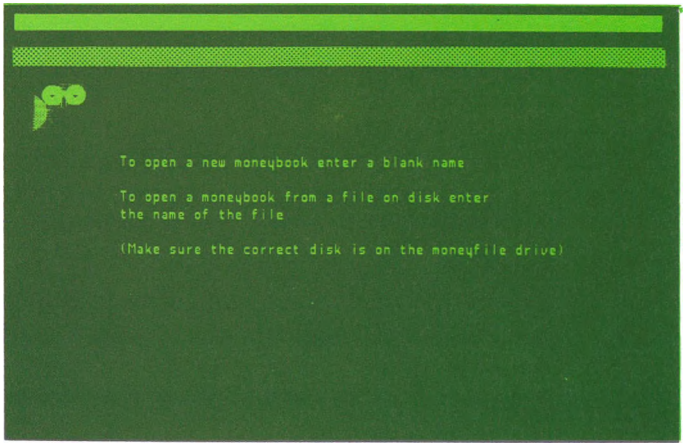
(a) Selection



(b) Service page



(c) Moneybook page



(d) Help screen

Elementary Control 3.2

Cells and the spotlight 3.2.1

Pages of the moneybook, and service screens, are arranged as forms to be filled in. The parts of the form designed to receive items of data are called *cells*. Generally one cell appears brighter than the rest – as though under a spotlight. This cell is called the *spotlit* cell.

Entering data 3.2.2

Data typed on the keyboard appear first in the top line of the screen. When return is pressed a copy of data in the top line is sent to the spotlit cell. This is how to fill cells with data. The process is called *entering*.

When an item of data has been entered from the top line the spotlight moves, or may be moved, to another cell.

3.2.3 Spotlight control keys

The spotlight can be controlled from the keyboard using spotlight control keys shown on the reference card. Experiment is recommended because no harm can be done. These keys are repeaters; in other words holding one down has the same effect as pressing it repeatedly.

3.2.4 Unacceptable items

When **return** is pressed so as to enter an item the top line is always checked to ensure it contains data of the form required by the spotlit cell. For example, the top line could contain letters when the spotlit cell required digits; in such a case there is a beep and the top line displays an error message for a few seconds. The item is not then entered in the spotlit cell but remains in the top line where it may be edited for another try.

3.2.5 Automatic progression

In general, when a moneybook page or service screen is displayed the spotlight illuminates the first cell to be filled. The spotlight then moves automatically to the next cell as each is filled.

The automatic progression of the spotlight may be overridden and stopped by pressing the spotlight control keys. But if a new direction is established (by entering data consistently) the progression of the spotlight may again become automatic in the new direction.

When the spotlight is on a title cell in a modelling column the spotlight refuses to move further down the same column as long as the title cell remains empty. This constraint prevents unidentified figures confusing a financial model. In general, should the spotlight refuse to move from an empty cell to a related cell it is because of such constraints.

3.2.6 Scrolling

Modelling pages are typically longer than can be shown on the screen. When the spotlight is moved from cell to cell down a column it should (logically) disappear below the edge of the screen. But this does not happen; the columns *scroll* upwards leaving the spotlight in view. The columns scroll back as necessary as the spotlight is raised again. The same principle, horizontally as well as vertically, applies to presentation pages.

Every part of every page of the moneybook may be viewed on the screen by directing the spotlight in this way.

Sometimes the program cannot respond to the keyboard until it has completed a calculation. In such cases the spotlight disappears from wherever it was and appears as a small flashing rectangle at the end of the top line. On completion of the calculation the spotlight resumes its usual function.

Holding down the **help** key causes the screen to display one or more paragraphs of guidance *about what should be entered in the spotlit cell*. In other words the system provides detailed and *selective* help; move the spotlight to another cell and the help would be different.

Spotlight off the page

3.2.7

The above describes movement of the spotlight on the working page. It is impossible to move the spotlight above the dividing band – or off the page – by pressing just the spotlight control keys.

The spotlight moves automatically to the top line when **leave** is pressed. (Leaving a page is discussed in 3.6.1 and 3.8.1.) But this step is not irrevocable; the spotlight may be moved back below the dividing band using spotlight control keys.

When the screen is one of those headed AVAILABLE PAGES or AVAILABLE SERVICES the spotlight cannot be moved from the top line onto the page below the dividing band because the page below has no cells for data. The spotlight remains on the prompt in the top line.

The spotlight jumps automatically to the top line when an open quote (double quote) is typed, and back to its previous location when the matching quote has been typed. For example, "tax" would be held under the spotlight but only whilst being typed.

Top Line of the Screen

3.3

Everything typed on the keyboard of the computer appears in the top line of the screen. What is typed may be sense or nonsense; only when **return** is pressed does the program assimilate what has been typed.

The technique of altering the top line – called *editing* – is explained in 3.5.

3.3.1 Response of top line

Sometimes the top line fails to respond to the keyboard. But if the keyboard should appear dead the appearance of the top line should explain why.

A flashing spot at the end of the top line shows the computer is too busy to respond for the time being.

The top line may contain a message. It would be found impossible to overtype or cancel anything in such a line. An example of such a top line is :

```
error: titles may not be blank
```

The top line does, however, remain responsive wherever there are gaps. For example when specifying a formula by which results in a column are to be calculated, the top line helps by displaying the skeleton of each formula, leaving gaps to be filled in. For example :

```
=subtract_   _minus__        _____________________
```

The rest of the line remains unresponsive to the keyboard.

Whilst a formula is displayed the spotlight illuminates the modelling column to which the formula applies. So when the gaps have been filled in, and **return** has been pressed, the whole top line is copied into the spotlit cell.

The following prompts frequently appear in the top line :

```
page please :
```

```
which service please :
```

As before, the response is typed in the subsequent gap.These prompts in the top line are always spotlit. Their function is explained in 3.6 and 3.8.

3.3.2 The cursor

In the top line is a dark rectangular spot which follows the typing but may be made to run independently, left or right, by pressing **left** or **right** respectively. This little dark spot is called the cursor.

The cursor starts at the beginning of the top line where it is difficult to see because it blends with the bordering. As each key is pressed the corresponding character appears under the cursor – which then steps one place to the right. This may continue until the top line is full (if more characters are typed each replaces the previous one at the end of the top line).

The cursor may be moved left or right to cover any character (which remains visible through the cursor) and another character typed over it. For example P can be changed to Q by this means. It is called overtyping, or *replacement*, and is the simplest form of editing. Other devices for editing are explained in 3.5.

Where there is underlining or the skeleton of a formula in the top line the cursor behaves as if the occupied parts did not exist – moving across to the next gap when **right** or **left** is pressed.

Entering data

3.3.3

The technique of putting data into cells is called *entering* and is explained in general terms in 3.2. Below are some details of the process.

When the spotlight illuminates a cell already containing data the contents of that cell are automatically copied into the top line. By the same ruling if the spotlit cell were originally empty the top line would be cleared. (In other words emptiness would be copied into it.)

Data intended for the spotlit cell are then typed in the top line – either by typing afresh or by editing what is there. At this stage anything can be assembled in the top line, sense or nonsense.

When **return** is pressed the program tries to put the contents of the top line into the spotlit cell.

If the data are of the correct form (a number if the cell requires a number, a text if the cell is to receive a column title, and so on) a copy of the top line appears in the spotlit cell obliterating any previous entry there. Nothing in the top line is changed. Then the spotlight may move, or be moved, to the next cell.

Where this manual says 'Enter' it means :

- type some data

■ edit if necessary

■ press **return**

so as to make the data (corrected if necessary) appear in the spotlit cell.

3.4 Errors

As explained above, when **return** is pressed the program tries to copy the contents of the top line into the spotlit cell. This is impossible if the data in the top line have the wrong form.

3.4.1 The error message

If the data are of the wrong form there is a beep from the computer and the top line of the screen displays an error message for a few seconds. At the end of those few seconds the erroneous data again appear in the top line; the content of the spotlit cell remaining as it was before the abortive attempt to change it.

If the user fails to read an error message when it first appears it may be made to reappear, whenever wanted, by pressing **return** again.

3.4.2 Simple correction

When the error is obvious (most errors are obvious) it is only necessary to edit the top line and press **return** again.

3.4.3 Obtaining help

If the error is not obvious from the message in the top line an amplified explanation may be displayed by pressing **help** and holding the key down.

After reading the help message one might decide not to enter data into this cell for the time being. In such a case it is best either to move the spotlight to another cell or leave the page altogether by pressing **leave**. No harm can be done either way because the bad data would not have been entered.

3.5 Editing the Top Line

Data in the top line of the screen may be edited under control of **left** and **right** – keys which make the cursor run left and right – and other editing keys with uses described below.

3.5.1 Replacement

Replacement is the simplest form of editing. The cursor may be moved over any character – which remains visible through the cursor – and another character typed over it. The replacement character may even be a space.

	All possible editing may be achieved by replacement – at worst by overtyping the existing line completely. But some useful short cuts are described below.	
Character deletion	A single character may be deleted, and the rest of the line closed up automatically, by placing the cursor over the offending character and pressing **delete**.	3.5.2
Rightward deletion	A character may be deleted, and the rest of the line to the right removed, by placing the cursor over that character and pressing **delete rest**.	3.5.3
Line deletion	The whole line may be deleted by pressing **delete line**. The position of the cursor is not significant in this case.	3.5.4
Insertion	One or more characters may be inserted anywhere in the line, the remainder of the line being pushed to the right so as to make room. Characters on the end of the line (usually spaces) are lost in the process. To achieve insertion press **insert**. Letter I then appears at the right hand end of the top line as a reminder. The deletion facility is unaffected but as long as letter I remains at the end of the line *replacement* remains impossible. The cursor should be moved to the character which is to follow the insertion then new characters may be typed. As each character is typed it appears where the cursor was. But the cursor, plus the character formerly under the cursor, plus the rest of the line are all shifted one place to the right. For example, if the cursor were placed over H in SHED, and the letters TRETC typed, then the line would display the word STRETCHED. To turn off the insertion facility, and revert to replacement, press **insert** again. The letter I then disappears from the end of the top line. The **insert** key acts as a push-push switch.	3.5.5

3.6 Selecting a Service

Along with financial modelling go some managerial chores such as opening, saving, renaming and deleting moneybooks. These chores are made as simple as possible by means of the Modeller services described individually in chapter 4. This section explains how to select any of these services and cause the appropriate service screen to appear.

3.6.1 Producing the prompt

It is possible to select a service when the following prompt is in the top line :

```
which service please :
```

This prompt may, in general, be made to go into the top line by pressing **leave** twice. On the first pressure the alternate prompt appears :

```
page please :
```

but this gives way to the prompt for a service on the second pressure. (Indeed, alternate prompts may be 'flip-flopped' by repeatedly pressing **leave**.)

3.6.2 Immediate selection

When the prompt for a service is in the top line a service may be selected immediately by typing the initial letter of the required service and pressing **return**. The service screen for the nominated service is then displayed. Completing service screens is explained in chapter 4.

3.6.3 List of available services

To see a list of available services press and release **help** whilst the service prompt is in the top line. The screen that appears is shown in fig. 3.2.

Services not currently available are not listed. The service for saving the open moneybook, for example, is not advertised until a moneybook is opened. This explains the difference between fig. 3.2 (a) and (b).

3.6.4 Help about any service

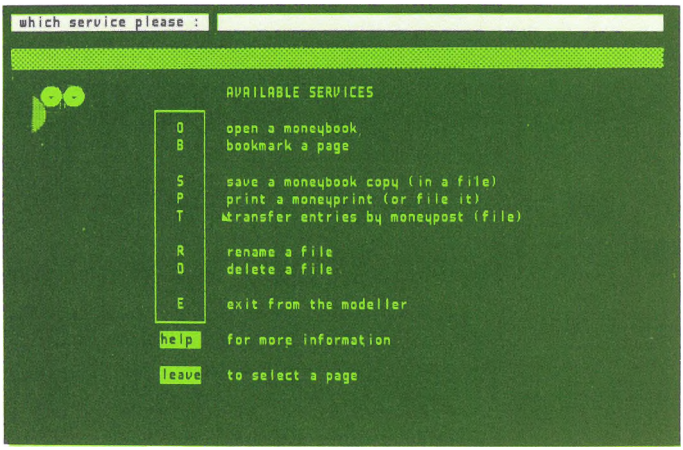
A service is selected by typing its initial letter and pressing **return** as already explained. The list of available services shows what initial letters may be typed but gives no help about the available services individually.

Nevertheless help is at hand. With the prompt for a service in the top line type any of the initial letters. Then *before* pressing **return** hold down the **help** key. The screen would then display one or more paragraphs of information about the service whose initial letter was typed.

It would be possible to read on the same screen about all the services (whether currently available or not) in the manner described above. But more thorough descriptions of the services are given in chapter 4 of this manual.

FIG. 3.2
LISTS OF AVAILABLE SERVICES

(a) Services initially available



(b) Full list of Services

3.7 Page Numbering

A moneybook has six sections; the pages are numbered separately in each. Page numbers (like car numbers) consist of letters and digits, the letter signifying the section of the moneybook in which the page belongs.

3.7.1 Contents page

The first section of the moneybook is the contents page. This is kept up to date automatically as the moneybook grows. Because there is always precisely one contents page no digits are necessary; the contents page is denoted C.

3.7.2 Key page

The second section of the moneybook is the key page. This is also generated automatically as the moneybook grows. The key page records the titles of all columns used on modelling pages. (Modelling pages are explained below). The key page also shows how the columns are used logically; for example one column is shown as being the sum of two others. The key page is denoted K.

3.7.3 Modelling pages

The third section of the moneybook contains as many as sixty-seven modelling pages, each with six modelling columns labelled a to f.

Modelling pages form the heart of a moneybook. Financial modelling involves putting data into modelling columns, performing arithmetical operations on them, combining them in various ways.

Modelling pages are numbered M01 to M67. A modelling column, on the other hand, is signified by a page number followed by a letter from a to f. For example, the second column on page M16 is denoted M16b.

3.7.4 Summary pages

Summary pages are optional.

A summary page has up to six columns, each being a copy of a modelling column. A summary page is useful for seeing selected modelling columns side by side although these columns may be pages apart in the moneybook.

Summary pages are numbered S01, S02 and so on.

Graph pages 3.7.5

Graph pages are for displaying important aspects of a model graphically. Fundamental though they are to a moneyprint they are nevertheless optional.

A graph page may display a conventional line graph, bar graph (histogram), or pie chart. It is simple to specify any of these.

Graph pages are numbered G01, G02 and so on.

Presentation pages 3.7.6

Presentation pages are for presenting results from modelling columns in a layout defined by the user of the system rather than in a standard layout imposed by the system. Presentation pages are optional. Presentation pages are numbered P01, P02 and so on.

Display of page numbers 3.7.7

The screen displays the early page numbers with two digits: M06 and G03 rather than M6 and G3. When typing a page number, however, the leading zero is optional.

The screen displays capital letters in page numbers but there is no need to press the shift key when typing the initial letter.

Summary 3.7.8

In summary, pages of the moneybook are numbered as follows :

C	Contents page (automatic)
K	Key page (automatic)
M01, M02, ...	Modelling pages (at least one)
S01, S02, ...	Summary pages (optional)
G01, G02, ...	Graph pages (optional)
P01, P02, ...	Presentation pages (optional)

Page numbers may be typed with only one digit (M6) but are always shown on the screen with two (M06).

Modelling columns are denoted by appending a letter to the page number (M06a to M06f).

Browsing in the Moneybook 3.8

When working on a moneybook one should be able to turn to any page quickly. This section explains how to turn to any page by quoting its number; how to turn the page over to its result

side and back; how to leaf through pages, forwards or backwards; how to use bookmarks for turning up critical pages at the touch of a key.

3.8.1 Producing the prompt

It is possible to select any page when the following prompt is in the top line :

page please :

This prompt may, in general, be made to appear in the top line by pressing **leave**. If **leave** is pressed again the prompt gives way to :

which service please :

and the two prompts may be 'flip-flopped' by repeatedly pressing **leave**.

3.8.2 Immediate selection

When the page prompt is in the top line a page of the moneybook may be turned up by typing the page number and pressing **return**. The nominated page then appears on the screen.

Because it is easy to forget the number of the last page in use the digits may be omitted when entering a page number. For example, M instead of M23. A solitary M causes the first page to appear which has an unused modelling column. Entering S, G or P causes the next free summary page, graph page or presentation page to appear.

3.8.3 List of page numbers

To see a list of pages numbers press and release **help** whilst the page prompt is in the top line. The screen that appears is illustrated in fig. 3.3.

Any one of sixty-seven modelling pages may be turned up, whether those before it are in use or not. However, for summary, graph and presentation pages it is only possible to turn as far as the page following the last page of that type already in use.

3.8.4 Help about page type

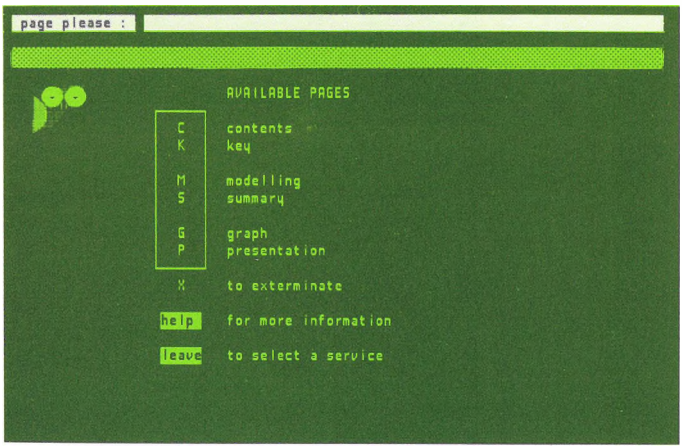
A page is turned to by typing a page number, or just the initial letter, and pressing **return** as already explained. The list of

page numbers shows what letters may be typed but gives no help about different kinds of page individually.

Nevertheless help is at hand. With the page prompt in the top line type any of the initial letters C, K, M, S, G, P. Then *before* pressing **return** hold down the **help** key. The screen would then display one or more paragraphs of information about pages of the nominated kind.

It would be possible to read the help about all the kinds of page as described above, but probably easier to refer to the more thorough descriptions in chapter 5.

FIG. 3.3
PAGE SELECTION



Turning over

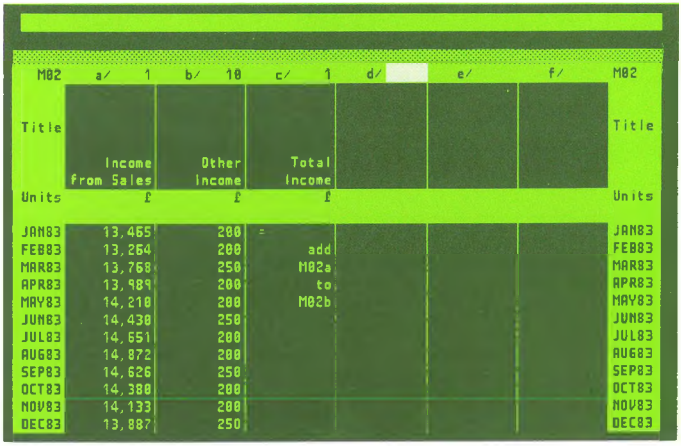
Apart from the contents page and key page, other pages of the moneybook have two sides; one showing the working, the other showing results. 3.8.5

Fig. 3.4 shows both sides of a typical modelling page. The working side illustrates two columns of data typed on the keyboard; also an instruction to make the third column the result of adding the first two, item by item. The result of the additions is shown on the results side.

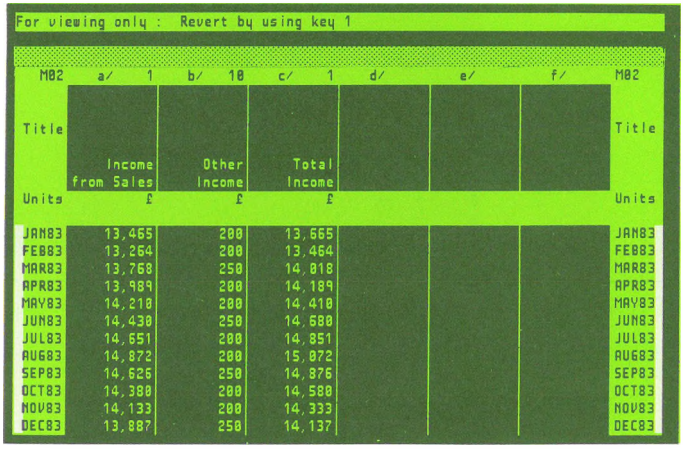
When a page is turned to, as described earlier, its working side is displayed. But it is easily turned over to its results side by pressing **f1** – then back to its working side by pressing **f1** again. (Pressing **f1** repeatedly turns the page back and forth.) More uses of **f1** and other function keys, are described in 3.8.6.

When a modelling page is included in a report its results side is printed; never its working side.

FIG. 3.4
TURNING OVER A MODELLING PAGE



(a) Working side



(b) Results side

3.8.6 Leafing through pages

When a page of the moneybook is displayed on the screen the next page may be displayed by pressing **next page** or the previous page by pressing **previous page**.

This facility is constrained to one section of the moneybook at a time :

- if the contents page or key page is displayed there can be no

leafing through pages to other sections; pressing **next page** or **previous page** would cause a beep and an error message

■ when a modelling page is displayed **next page** may be pressed repeatedly, thus displaying successive pages, until page M67 is on display; any attempt to go further would be signalled as an error. Similarly **previous page** may be pressed repeatedly until page M01 is on the screen

■ when a graph page is displayed **previous page** may be pressed until page G01 is on display; **next page** may be pressed until the page after the last graph page in current use is on the screen. For example, if G01 and G02 were the only graph pages in current use, pressing **next page** would work as far as G03

■ the constraints described for graph pages apply to summary pages and presentation pages.

Setting bookmarks

3.8.7

A bookmark is for turning directly to the results side of a marked page by pressing a single key.

A page is bookmarked by associating that page with one of the keys **f2** to **f5** using the service described in 4.3.

If, for example, **f3** is associated with the contents page then pressing **f3** causes the contents page to appear on the screen. Pressing **f3** again makes the original display reappear. Pressing **f3** repeatedly makes the screen alternate between its original display and the contents page.

If **f4** is associated with modelling page M22, for example, pressing **f4** makes page M22 appear on its results side. It cannot then be turned to its working side. Pressing **f4** again would make the original display reappear. However, it is possible to turn to the working side by adopting the procedure described in 3.8.5.

With page M22 displayed, and before pressing **f4** to get back to the original screen, it is possible to leaf through modelling pages using **previous page** and **next page** as already explained. But as each page moves by *so does the bookmark*. For example: with **f4** originally set at M22, pressing **f4** then **next page** then **next page** makes the screen show page M24;

f4 is now *reset* at M24. (To prove it press f4 to get back to the original display then see what happens when you press f4 again.)

3.8.8 Automatic bookmark

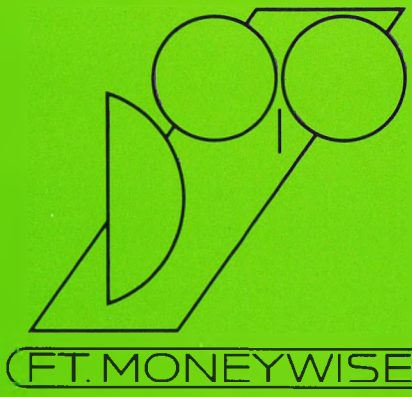
Function key f1 behaves as other bookmarks except that it is set, reset and unset automatically.

It becomes *unset* whenever the screen displays a selection of pages, a selection of services, or any of the service screens. Under such circumstances pressing f1 results in a beep and error message.

The bookmark is *set* at whatever page is currently selected. So if M6 (say) is typed in response to the page prompt f1 becomes set at page M06.

Function key f1 has already been described as a key for turning a page. This concept is not in conflict with the current description of f1 as an automatic bookmark. Because when M6 (say) is entered two things happen: the working side of M06 appears and M06 receives f1 as a bookmark. Pressing any bookmark key makes the associated page appear on its results side; in the case of f1 this is the results side of the current page. In other words the current page is turned over.

As already explained, when a page is turned to (in response to the page prompt) it is possible to leaf through adjacent pages by pressing previous page and next page. Any bookmark will follow as already described. Function key f1 is no exception, becoming the bookmark for each page in turn. Therefore, whilst leafing through pages in this way, it is possible to turn any page over by pressing f1. When a page is turned to its results side continued leafing makes successive pages appear on their results side also. Pressing f1 again makes them revert to their working side.



4

The Services

Services

General

4.1

Along with financial modelling go some chores such as copying disks and deleting files. Some of these chores are carried out by the program called the Manager as described in chapter 2. Others, described in this chapter, are carried out under control of the Modeller.

Selecting a service

4.1.1

The means of selecting a service are explained in detail in 3.6.

Briefly :

- get the prompt for a service into the top line by pressing **leave** twice if necessary
- if a list of available services (fig. 3.2) is wanted press and release **help** :
- type the initial letter of the service needed
- hold down the **help** key and read about the nominated service if desired
- press **return**.

The service screen would then be displayed.

Summary of services

4.1.2

The services are summarized below; then follows an explanation of the use of each service screen :

O Open a moneybook. This may be a new (empty) moneybook or a copy of a partially complete moneybook filed on disk

B Bookmarks. Each is an association of a key on the keyboard with a page in the moneybook. Pressing the key subsequently causes that page to be displayed

S Save as a file a copy of the moneybook which is currently open

P Print a moneyprint or save it on disk for printing later

T Transfer information by moneypost. A moneypost is a file; it

is the medium of communication between moneybooks and between this system and others

R Rename one of the files (i.e. moneybooks, moneyposts, moneyprints) currently held on disk

D Delete one of the files currently held on disk

E Exit from the Modeller and go back to the Manager.

After using a service it may not be necessary to press **leave** in order to leave the service screen. In most cases this happens automatically when the last cell has been filled.

4.1.3 Use of the spotlight

When a service screen is selected the screen appears with the spotlight on the top cell. When this cell has been filled the spotlight moves, in general, to the next cell, and so on.

However, the spotlight does not always move on. In certain cases the spotlight remains on the cell which has just been filled. The spotlight should then be moved to the next cell using the spotlight control keys.

In the rest of this chapter little mention is made of the spotlight which is assumed to be on the cell under discussion – by automatic progression or pressing keys as the case may be.

4.2 Open a Moneybook

Fig. 4.1.(a) shows the screen that appears when the prompt for a service is answered with letter O.

Before working on a moneybook it has to be opened. An open moneybook (the moneybook in the computer's memory) may be established in either of the following ways :

■ retrieving a copy of a moneybook previously saved on a disk under a unique name. In this case make sure the correct disk is on the moneyfile drive and the door to the drive is shut

■ opening a new and empty moneybook in which case there is no file name involved.

Name of moneybook	The screen initially shows a solitary cell. **FILE NAME :** If the open moneybook is to be a copy of a file on disk enter the file name here. If a new moneybook is to be started enter a blank; in other words ensure the top line is blank and press **return**. If a name is entered which cannot be found on the disk, or does not belong to a moneybook, an error message appears. The top line may then be edited for another try, the disk changed, or the process abandoned by pressing **leave**. When a name is entered which proves to be the name of a moneybook already saved on disk a *copy* of that moneybook is brought into the computer's memory to become the open moneybook. If the cell is left blank an empty moneybook is opened in the computer's memory. Once the name cell has been dealt with, more cells appear on the screen as illustrated in fig. 4.1 (b).	4.2.1
Title of moneybook	When a copy of a moneybook is brought from the disk into memory the next cell displays its title. When a new moneybook is opened this cell shows blank. **TITLE :** Enter a title for the moneybook up to 51 characters long including spaces. If there is already a title it may be left intact by pressing **return** or it may be edited first. A blank title is not allowed. The title is used to describe the contents of the file as explained in 1.5.	4.2.2
Starting date	A starting date conveys two distinct pieces of information : ■ the date of the first entry in the moneybook ■ the interval (weekly, monthly, quarterly, annually) for periodic entries in the moneybook. The second piece of information is conveyed by the *form* in which the date is expressed. There are five possibilities, each introduced by example below:	4.2.3

		50-83 Week 50 of 1983. Weekly intervals. 50-83, 51-83, 52-83, 1-84, . . . APR83 April 1983. Monthly intervals. APR83, MAY83, JUN83, . . . 1st83 First quarter 1983. Quarterly intervals 1st83, 2nd83, 3rd83, 4th83, 1st84, . . . 1983 Year 1983. Annual intervals. 1983, 1984, 1985, . . . 24 Arbitrary time scale. Unit intervals. 24, 25, 26, . . . Leap years are handled automatically; the problem of a year not comprising precisely 52 weeks is resolved later. START DATE : Enter a date in one of the forms illustrated above. In a moneybook just copied from disk there would be a starting date already in this cell; the most usual course is to leave it alone (just press **return**). In certain circumstances a starting date may be changed. For example, a project may be modelled using a starting date of 1 and working to monthly intervals. Thus the rows on modelling pages would be numbered 1, 2, 3 and so on. Eventually a decision would be made to start the project in, say, April 1986. In such a case the starting date could be changed from 1 to APR86. The effect would be to re-label the rows of all modelling pages. If quarterly intervals had been adopted when building the model then the starting date should be changed to 2nd86, not APR86. The new date should express, by its form, the time intervals to which the model was built. Another example: a starting date of 12-84 might be changed to 20-84 to reflect an eight-week slippage in plan.
4.2.4	Years of 53 weeks	Entering a starting date in weekly form (e.g. 13-83) causes extra cells to appear on the screen. A calendar year has 52 weeks and a few days. The program assumes that every year has precisely 52 weeks unless specified as having 53 weeks. This may be done by nominating 53-week years (e.g. 1984) in the new cells provided.

53-WEEK YEARS : If there are no 53-week years leave all cells blank; otherwise enter one, two or three of those years in the cells provided.

Notes

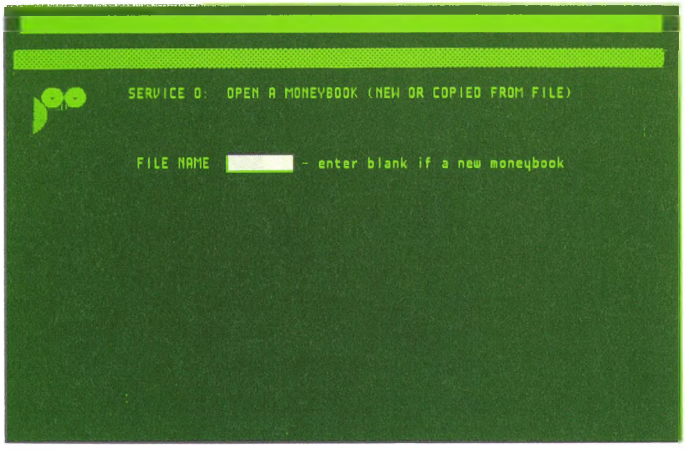
Notes are not obligatory but can be helpful. They are essentially an extension of the title. 4.2.5

NOTES : Enter up to four lines of notes, up to 51 characters in each line including spaces. Leave blank lines if desired.

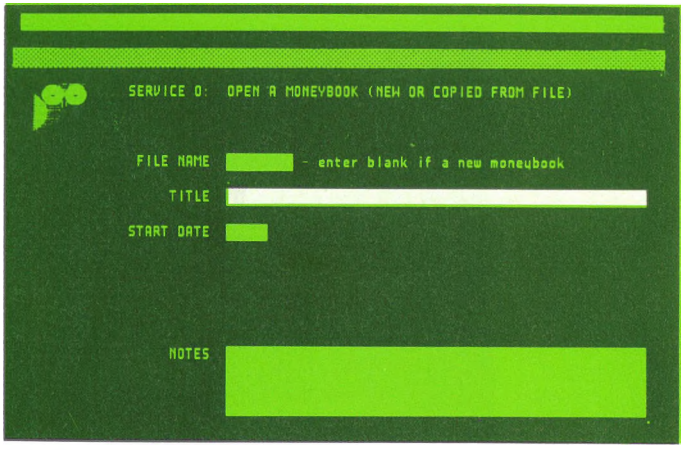
Leaving

To leave this page press **leave**; 4.2.6

FIG. 4.1
OPENING A MONEYBOOK



(a) Initial appearance



(b) All cells displayed

4.3 Bookmark Settings

Fig. 4.2 shows the service screen that appears when the prompt for a service is answered by entering B. This service is for setting bookmarks at pages in the moneybook.

A bookmark is set when one of the keys f2 to f5 is associated with a page of the open moneybook. Subsequently, on pressing that key, the associated page is displayed on the screen. Pressing the same key a second time makes the original screen reappear.

Bookmarks are explained more fully in 3.8.7.

To set a bookmark direct the spotlight to the small cell next to one of the function keys depicted on the screen :

Next to **f2 – f5**: Enter the page number (in the form defined in 3.7) of the moneybook page to be bookmarked.

Pages of any kind may be bookmarked, including contents page, C, and key page, K.

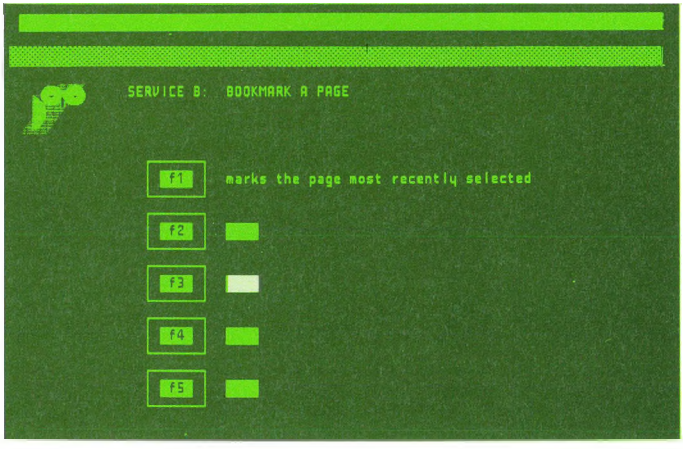
4.3.1 Page titles

On entering a page number a legend appears under the spotlit cell. This says, for example, **MODELLING PAGE M02** or **CONTENTS PAGE**. In the case of summary pages, graph pages and presentation pages the title is reproduced; for example, **Revenue Reserves and Current Balance**. The page number remains in the spotlight so it is simple to change the page number if the legend indicates the wrong page.

4.3.2 Leaving

Press leave to leave this page.

FIG. 4.2 PLACING BOOKMARKS



Save the Open Moneybook	Fig. 4.3 shows the service screen that appears when the prompt for a service is answered with S. This service is for saving a copy of the open moneybook – the moneybook in the computer's memory – as a file on disk. Ensure the correct disk is in the moneyfile drive.	**4.4**
Title	The first cell already contains a title because it is impossible to create a moneybook without one (this is explained in 1.5). TITLE : Either leave the existing title alone by pressing return or edit the top line and enter an amended title. Up to 51 characters, including spaces, are allowed in a title.	4.4.1
Notes	Notes are not obligatory; there may already be notes in one or more of these four cells. Notes are essentially an extension of the title. NOTES : Spotlight any row and enter a note or edit the note already there. Up to 51 characters, including spaces, are allowed in each of the four rows.	4.4.2
Name of file	Every moneybook saved as a file on disk must be given a name by which to retrieve it. FILE NAME: Enter the name under which this copy is to be filed. Names are composed of letters or digits or both and may be up to eight characters long. The name given determines what happens next. There are three possibilities : ■ there happens to be a file on disk with this name but it is not a file of the same kind. The three kinds are moneybook, moneypost, moneyprint. There is a beep and an error message appears ■ the name is new to the disk ■ the name is the same as that of a moneybook already filed on the disk. In the first instance the top line may be edited for another	4.4.3

attempt, the disk changed in the moneyfile drive, or the attempt abandoned by pressing **leave.**

In the second instance a message is displayed to say that the name is new and an extra cell appears :

OK TO FILE ? Enter yes (y for short) if the name is correct and is intended to be a new name. Otherwise enter no (or n) in which case the spotlight returns to the previous cell so that the name may be changed.

In the third instance a message appears saying there is already a file of this kind and of this name on disk. An extra cell then appears :

LOSE OLD VERSION ? Enter yes (y for short) if the old version is to be overwritten by a copy of the open moneybook. Enter no (or n) if the existing file is to be kept in which case the spotlight returns to the previous cell so that the name may be changed.

It is common practice to file a copy of the open moneybook under a name used previously. This may be thought of as 'updating' or 'replacing' an old file on the disk. An illustrated example of such replacement is given in 1.5.

4.4.4 Precautions

Before entering the name under which a copy of the open moneybook is to be filed ensure the correct disk is on the moneyfile drive and that the door to the drive is shut.

When a name is entered the spotlight moves automatically to the extra cell and the program waits for confirmation. Whilst the spotlight is on this 'confirmation' cell *on no account change the disk on the moneyfile drive*. Remove the spotlight (for example, by entering no) before attempting to change the disk.

4.4.5 Overflow

The disk may not have enough room for a copy of the open moneybook.

If the disk runs out of space before the moneybook has been fully copied an error message appears. If the operation was to 'update' or 'replace' an existing file then the original file would have been deleted at this stage.

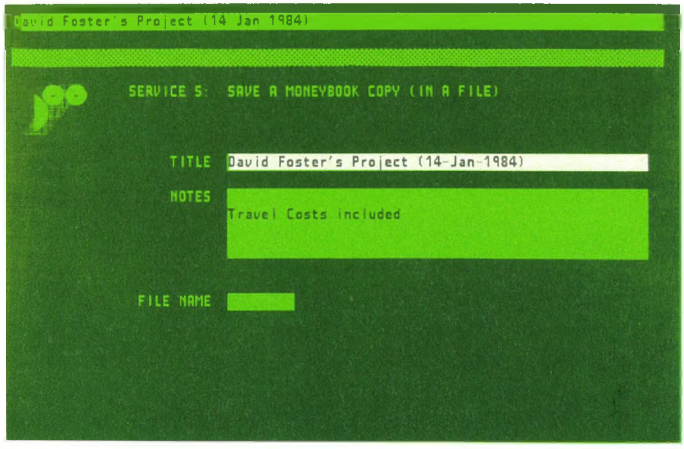
There are two remedies for overflow. The first is to make room on the current disk by deleting unwanted files; the second is to replace the disk with one less full.

Unwanted files may be deleted by leaving the current page and selecting the deletion service described in 4.8. If the disk is replaced use a disk prepared as described in 2.5. But never change disks whilst the spotlight is on the 'confirmation' cell.

Leaving

There is no need to press **leave** when copying is successfully completed; the spotlight moves automatically to the top line where a prompt invites selection of a page. 4.4.6

FIG 4.3
SAVE A FILE



Printing Reports - Moneyprint

4.5

Fig. 4.4 shows the service screen that appears when the prompt for a service is answered with P. This service is for printing a selection of pages from the open moneybook – in other words a moneyprint.

On this service screen it is possible to specify that printing is to be deferred by saving the moneyprint on the disk in the moneyfile drive. Subsequently the file would be printed under control of the Manager. Several copies could be printed before eventually deleting the file.

4.5.1 Ordinary use

The description below covers ordinary use of this service screen. However, the subject of printing is enlarged in chapter 11 where it is explained how to change :

- the list of paper dimensions shown on the right of the service screen
- the number of characters per inch (cpi) in horizontal pitch
- the number of lines per inch (lpi) in vertical pitch
- the legend which shows what type of printer is to be employed.

4.5.2 Pages

The block of cells on the left is for specifying a selection of pages from the open moneybook – in other words pages of the moneyprint.

COVER : Enter 1 if a cover sheet is wanted otherwise leave blank. A text may be printed on the cover sheet; there is a special cell for this below.

CONTENTS : Enter 1 if a page of contents is wanted otherwise leave blank.

KEY : Enter 1 if a key page is required otherwise leave blank.

The remaining cells are for specifying ranges of modelling pages, summary pages, graph pages, presentation pages. A range is expressed as two page numbers (without a qualifying letter in front) separated by a minus sign. For example 2-14, in the context of modelling pages, signifies pages M2 to M14 inclusive. A single page may be indicated by a single number, for example 3-3 may be simplified to 3. A cell left blank signifies that no pages of that particular kind are required.

MODELLING : Enter the range of modelling pages required in the moneyprint.

SUMMARY : Enter the range of summary pages required.

GRAPH : Enter the range of graph pages required.

PRESENTATION : Enter the range of presentation pages required in the moneyprint. Two cells are provided so that two separate ranges may be specified; for example 3-4 and 6-7. Either or both cells may be left blank.

Dates

4.5.3

Associated with each kind of page is a pair of date cells headed **date1** and **date2** on the screen. Dates entered in these cells should be expressed in the same form as those in the open moneybook.

Dates are irrelevant to the cover sheet, contents page, key page. The screen shows dashes in corresponding cells and it is impossible to change them. Among the remaining types of page the interpretation of **date1** and **date2** varies.

A moneybook has 168 rows (dates) of which perhaps only a dozen or two are needed in the printed report.

MODELLING : Enter two dates – between which the entries in modelling pages are to be included in the moneyprint.

SUMMARY : Enter two dates as described above, but for the summary pages. These may cover a different range from the modelling pages if desired.

Leaving either **date1** or **date2** blank implies twelve intervals starting at the interval for which the date is given. Leaving both dates blank implies twelve intervals from the starting date of the moneybook.

There is no need to limit the range of dates to the capacity of a printed page; pagination of results is automatic.

Should a specified range begin before the starting date of the moneybook – or end after its last line – the specified pages are nevertheless printed. Dashes are printed as entries wherever the range falls outside the moneybook itself.

Dates for graph pages are more complicated in their interpretation. A line graph has two dates specified: one at the origin of its time axis, one at the end of its time axis. A bar graph is the same in this respect. A pie chart is different; each pie has a date. Putting two dates on the graph page signifies two pies.

		But for understanding the explanation below it may be assumed that a pie is drawn at either end of a time axis – like a line plot with one point at each end of the line or a bar graph with just two bars. **GRAPH :** Leave both cells blank if the dates on the graph page itself are to apply. Enter one date (in either cell) to override the date at the origin of the axis. A single date overrides the date originally specified at the origin of the time axis. The date at the other end of this axis is automatically recalculated so as to keep the number of time intervals along the time axis the same as before. Every presentation page has a base date. Other dates on a presentation page may be absolute (therefore cannot be altered using this service) or may be specified relative to the base date. **PRESENTATION :** Leave both cells blank if the base date on the presentation page itself is to apply. Enter one date (in either cell) to override the base date. In the case of presentation pages and graph pages dates entered in both cells signify two presentation pages – or two plots – rather than one. Each presentation page – or plot – is treated independently in the manner already described for a single date.
4.5.4	Annotation	A cover sheet is shown in fig. 1.2. The title and comments printed on the cover sheet should be entered here. **TITLE :** Enter a title up to 51 characters long including spaces. **COMMENTS :** Spotlight and complete either or both rows. On each row may be entered any comment up to 51 characters long including spaces.
4.5.5	Draft or fine printing	There is a choice between draft printing (which is fast) and fine printing (which is slower but prettier). **DRAFT/FINE STYLE :** Enter the letter **d** or **f** (short for draft or fine) to select the desired style.

To the right of this cell is a description of the type of printer assumed to be connected. Chapter 11 explains more about types of printer.

Immediate prints — 4.5.6

A moneyprint may be sent straight to the printer or filed on the moneyfile disk.

FILE NAME : To make an immediate print enter a blank (in other words ensure the top line is blank and press **return**).

On entering a blank a question appears in the top line before printing starts :

```
is the printer connected  ?
```

This should be answered yes or no (y or n for short). If this question were answered affirmatively when the printer was not connected the program would wait, without further response, for the printer to be connected.

Answering yes when a printer is properly connected causes printing to begin. Once started, printing may be interrupted by pressing **leave** at any time; interruption occurs at the end of the current moneybook page.

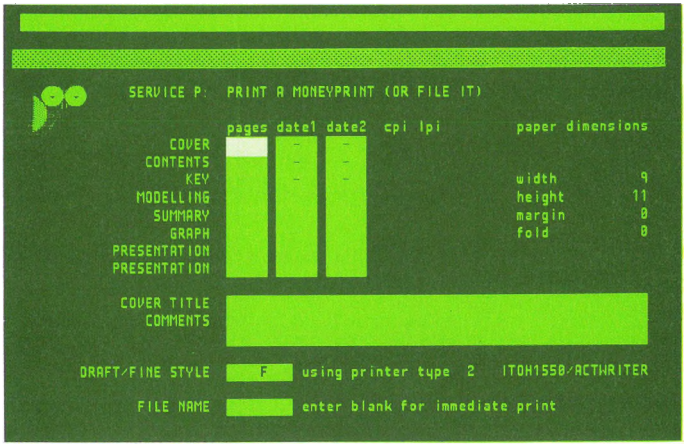
Filing a moneyprint — 4.5.7

The moneyprint may be saved on the disk in the moneyfile drive for printing under control of the Manager later. (One or more copies could be printed before finally deleting the filed moneyprint.)

FILE NAME : Enter the name to be given to the moneyprint as a file on disk. Names are composed of letters or digits or both and may be up to eight characters long.

The name given determines what happens next. The three possibilities are explained in detail in 4.4 which is concerned with saving a moneybook. But saving any file – whether moneybook, moneypost or moneyprint – involves an identical procedure. The same precautions are needed (see 4.4.4) and the same remedies may be applied if there is overflow (see 4.4.5).

FIG 4.4
PRINT (OR FILE) A MONEYPRINT



4.6 Transfer by Moneypost

Principles of the moneypost are explained and illustrated in 1.4.

Information may be copied *out* of the open moneybook into a moneypost (i.e. a file to be created on the disk). Alternatively, information may be copied *in* to the open moneybook from an existing moneypost on disk.

4.6.1 Mode

Fig. 4.5(a) shows the service screen that appears when the prompt for a service is answered with T (for Transfer). Initially there is only one cell on the page :

MODE : Enter OUT or IN or IN+ or IN– where the significance of these entries is explained below.

The four modes are :

OUT — copy entries out of the open moneybook and create a moneypost on the moneyfile disk

IN — copy entries into the open moneybook from a moneypost already filed on disk. As each item is put into the open moneybook it *replaces* the item previously stored in its place

IN+ — as IN but each item is *added* to the corresponding item in the open moneybook rather than replacing it

IN− as IN but each item is *subtracted* from the corresponding item in the open moneybook rather than replacing it.

When the mode is entered additional cells appear on the page. The pattern of cells for mode OUT is shown in fig 4.5 (b). For modes IN, IN+, IN−, the pattern is shown in fig. 4.5 (c).

Title

In OUT mode a title must be provided : 4.6.2

TITLE : Enter a title up to 51 characters long including spaces. This cell may not be left blank.

Pages

The data in a moneypost are copied from selected pages of the open moneybook. These may be modelling pages or summary pages or both. 4.6.3

MODELLING PAGES : Leave blank or enter a range of pages in the form of two numbers separated by a minus sign. For example, 9-14 means pages M09 to M14 inclusive. A single number may be used for a single page; for example 16 means page M16 only.

SUMMARY PAGES : Leave blank or enter a range of pages in the form described above. For example 2-5 means pages S02 to S05 inclusive.

The moneypost makes no record of page numbers. So it is possible, for example, to create a moneypost with summary pages 1-5, and subsequently copy them to modelling pages 25-29 of a different (but compatible) moneybook. Moneyposts carry only data from columns not column titles or other qualifying information. Implications of such transfers are described in chapter 10.

Date range

It is not necessary to transmit the whole of each page. The date range specifies a horizontal 'time band' across the open moneybook; only the data in the specified time band are affected. 4.6.4

The date range is specified, in general, as two dates:

DATE- : Enter date at start of range
to
DATE : Enter date at end of range.

Both dates must be expressed in the same form as those in the moneybook.

Either cell may be left blank to signify that the date range comprises a single row in the moneybook. (Leaving both cells blank would signify an empty moneypost.)

4.6.5 Overlapping ranges

The date range may begin before the starting date of the moneybook or end after the final date (moneybooks have 168 rows) or both. In other words the time band need not fall entirely between the top and bottom edges of the open moneybook. Implications of an overlap are:

- with OUT mode : dashes are generated automatically as though the open moneybook extended, empty, to the date which is out of range

- with IN mode : entries which fall outside the open moneybook (above its top edge; below its bottom edge) are ignored.

The 'top edge' means the first row of data in the moneybook; not column titles, units or any such qualifying material.

4.6.6 Name when mode is OUT

Every moneypost saved on disk is given a name. The moneypost is filed on the disk in the moneyfile drive.

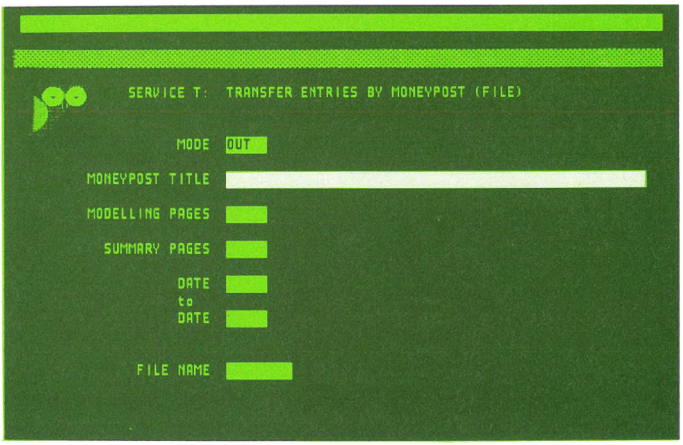
FILE NAME : Enter the name under which this moneypost is to be saved. Names are composed of letters or digits or both and may be up to eight characters long.

The name given determines what happens next. The three possibilities are explained in detail in 4.4 which is concerned with saving a moneybook. But saving any file – whether moneybook, moneypost or moneyprint – involves an identical procedure. The same precautions are needed (4.4.4) and the same remedies may be applied if there is overflow (4.4.5).

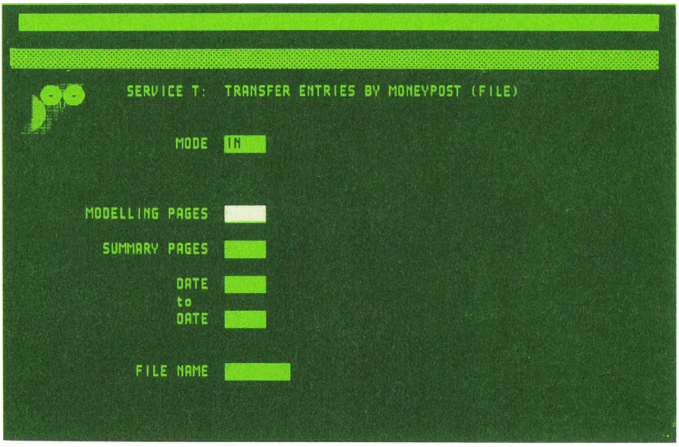
Name when mode is IN	Moneyposts are retrieved by name. **FILE NAME :** Enter the name under which the required moneypost is saved. If the given name cannot be found on the moneyfile disk, or proves to be the name of a moneybook or moneyprint rather than a moneypost, an error message appears. The top line may then be edited for another try, the disk changed, or the process abandoned using **leave**. When the given name matches that of a moneypost the title of the moneypost appears under its name for confirmation. A new cell appears : **OK TO PROCEED ?** Enter yes or no (y or n for short). Entering no cause's the spotlight to return to the previous cell.	4.6.7
Incompat-ibility	It is possible for the various ranges specified on the service page to be incompatible with the open moneybook but the incompatibility not to become evident until part way through the transfer. For example the service screen may specify a summary page which does not exist in the open moneybook. In such a case the transfer would cease. The screen would then display details of what pages had already been transferred successfully. There is more about incompatibility in chapter 10.	4.6.8
Leaving	There is no need to press **leave** when transfer is complete; the spotlight moves automatically to the top line where a prompt invites selection of a page.	4.6.9

FIG. 4.5
TRANSFER BY MONEYPOST

(a) requesting the mode



(b) mode OUT



(c) mode IN, IN+, IN–

Rename a File 4.7

Fig. 4.6 shows the service screen that appears when the prompt for a service is answered with R. This service is for giving a new name to any file – moneybook, moneypost, moneyprint – currently on disk.

There are two cells on the service screen: the top one has to be completed first.

CURRENT NAME : Enter the name of the file which is to be given a new name. The nominated file should be one of those on the disk in the moneyfile drive – the door being shut.

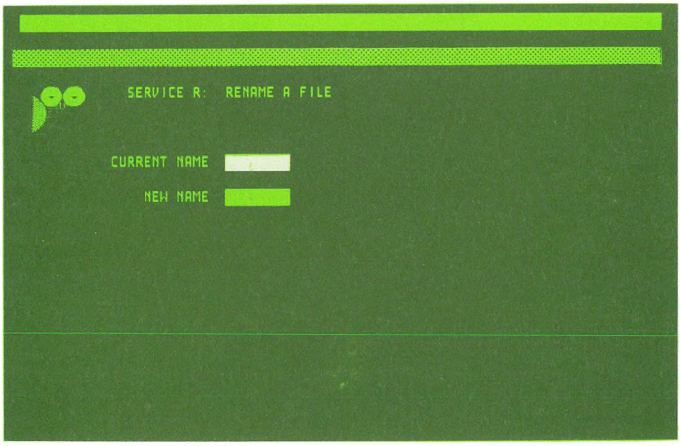
If the name entered cannot be found on the disk (or if a blank name is entered) an error message appears, the cell remaining empty. There is now a chance to edit the top line and try again. Or the disk in the moneyfile drive could be changed or the process abandoned by pressing **leave**. But once an acceptable name has been entered the spotlight moves to the second cell.

NEW NAME : Enter the new name to be given to the file nominated in the cell above. Names are composed of letters or digits or both and may be up to eight characters long. On no account change the disk on the moneyfile drive whilst this cell is spotlit.

If the name entered proves to be unique on the disk the specified change of name takes place and the spotlight moves to the top line, there being no need to press **leave**. But if the

name is not unique among files on the disk on the moneyfile drive an error message appears. There is then the chance to edit the top line and try again or press leave to abandon the whole attempt.

FIG. 4.6
RENAME A FILE



4.8 Delete a File

Fig. 4.7 shows the service screen that appears when the prompt for a service is answered with D. This service is for deleting any file (whether moneybook, moneypost or moneyprint) currently on the disk on the moneyfile drive.

There is only one cell on the service screen :

FILE NAME : Enter the name of the file to be deleted.

If the nominated file cannot be found on the disk an error message appears. The top line may be edited for another try or the disk in the moneyfile drive changed or the process abandoned by pressing leave

If the name entered is found on the disk the nominated file is deleted forthwith. There is then no need to press leave because the spotlight moves automatically to the top line.

FIG. 4.7
DELETE A FILE

Exit from the Modeller

4.9

Fig. 4.8 shows the service screen that appears when the prompt for a service is answered with E. This service is for leaving the current program (the Modeller) and returning to the Manager described in chapter 2.

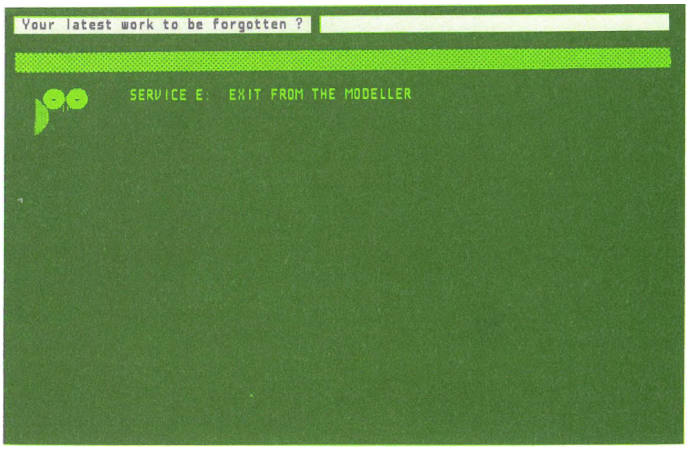
The disks should be in their start-up position (the doors to the drives shut) when this service is requested. The start-up position is described on the reference card. If the disks are wrongly placed the program refuses to leave the Modeller.

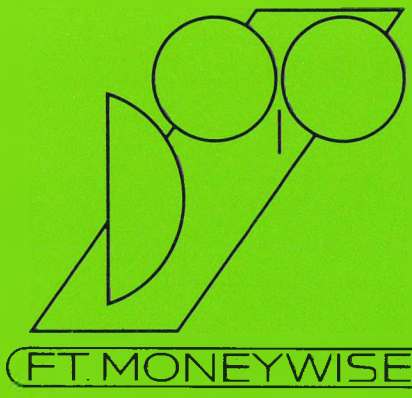
This service is usually requested straight after saving the current moneybook, in which case there are no cells to fill or questions to answer; the screen eventually changes to that displayed by the Manager. But on an attempt to leave the Modeller before saving the current moneybook the top line asks the following question to be answered yes or no (y or n for short) :

Your latest work to be forgotten ?

If the response is yes the Modeller is abandoned and the Manager's screen displayed. If the response is no the screen changes to the service screen described in 4.4. It is as though the service selected had been S (for Save) rather than E (for Exit).

FIG. 4.8
CLOSING THE MODELLER





5

Pages on the Screen

Pages on the Screen

5

The moneybook comprises pages of six possible types: contents page, key page, modelling pages, summary pages, graph pages, presentation pages. Contents and key page are generated automatically. There must be at least one modelling page but summary, graph and presentation pages are optional.

The contents page and key page have no working side but all others do.

This chapter describes the function of each type of page and explains how to complete the working side. The reader is assumed to be familiar with the mechanics of control described in chapter 3.

Contents Page

5.1

The contents page is compiled automatically and therefore has no working side.

A typical contents page is shown in fig. 5.1.

The first item on every contents page is a reference to the key page – which has a standard title. Then comes the range of modelling pages in use, also with a standard title. (The range could be misleading if many blank pages were left in the middle.)

If there were no summary pages, graph pages or presentation pages, the rest of the contents page would appear blank. But for every such page introduced there would be a line on the contents page in the appropriate category. Each line would show a page number and title; the title having been composed by the user.

When the contents page is too long for the screen it may nevertheless be examined. The spotlight keys for vertical movement may be used to scroll the page up and down. (A printed contents page is automatically paginated to fit the available stationery.)

FIG. 5.1
CONTENTS PAGE

For viewing only :

CONTENTS OF THE MONEYBOOK

TYPE	NO.	TITLE
KEY	K	Key to model
MODELLING	M01 M16	Range of modelling pages in use
SUMMARY	S01	SHARE OF PROJECT PROFITS
	S02	DISCOUNTED CASH FLOW & RETURN ON INVESTMENT
	S03	NET PRESENT VALUE & AVERAGE RATE OF RETURN
	S04	CHECK UK CASH FLOW WITH PROFITS -SET EXCHANGE TO 1.
	S05	CHECK CANADIAN CASH FLOW WITH PROFITS
GRAPH	G01	UK DISCOUNTED CASH FLOW
	G02	UK PROFITABILTY TOTAL PROJECT
	G03	PROFITABILITY - UK vs CANADA
	G04	CANADIAN PROFITABILITY - DOLLARS
	G05	CANADIAN DISCOUNTED CASH FLOW

(a) Contents page on screen

CONTENTS OF THE MONE-BOOK

TYPE	NO.	TITLE
KEY	K	Key to model
MODELLING	M01 M16	Range of modelling pages in use
SUMMARY	S01	SHARE OF PROJECT PROFITS
	S02	DISCOUNTED CASH FLOW & RETURN ON INVESTMENT
	S03	NET PRESENT VALUE & AVERAGE RATE OF RETURN
	S04	CHECK UK CASH FLOW WITH PROFITS -SET EXCHANGE TO 1.
	S05	CHECK CANADIAN CASH FLOW WITH PROFITS
GRAPH	G01	UK DISCOUNTED CASH FLOW
	G02	UK PROFITABILTY - TOTAL PROJECT
	G03	PROFITABILITY - UK vs CANADA
	G04	CANADIAN PROFITABILITY - DOLLARS
	G05	CANADIAN DISCOUNTED CASH FLOW
	G06	UK JOINT VENTURE & MANUFACTURING PROFITS
	G07	COMBINED PROFITS
	G08	CANADIAN JOINT VENTURE & MARKETING PROFITS
	G09	COMBINED SHARE OF PROFITS
	G10	COMPARISON NET PRESENT VALUE
	G11	COMPARISON OF ANNUAL PROFITS (STERLING)
PRESENTATION	P01	PRESENTATION OF RESULTS
	P02	ANALYSIS OF PROFITS

(b) Contents page as printed

Key Page

The key page is compiled automatically and therefore has no working side.

A typical key page is shown in fig. 5.2.

The key page has a block of information for every modelling page in use. In each of these blocks is a line of information about each modelling column in use.

The line of information about a modelling column contains column number, column title, and a note about what the column contains. This is the *definition* of the column. If there are no entries yet the definition says **:inactive**.

Entries in a column have two possible sources: either they were input directly or they were derived from other entries. In the first case the column definition says **:data**; in the second case the definition is a formula.

Most of the formulae are comprehensible without reference to chapter 7 in which they are all defined. For example = **multiply M01a by M01b** says that each entry in this column is obtained by multiplying corresponding elements found in columns M01a and M01b.

Thus the key page is a key to the structure of the model; it defines precisely the derivation of every entry contained.

When the key page is too long for the screen it may be examined by scrolling as explained for the contents page.

FIG. 5.2 KEY PAGE

(a) Key page on screen

k	KEY TO MODEL		k
NO.	COLUMN TITLE	DEFINITION	
M01a	1st floor rooms let	:data	
M01b	2nd floor rooms let	:data	
M01c	1st floor price	:data	
M01d	2nd floor price	:data	
M01e	weeks per month	:data	
M01f	1st floor income per week	=multiply M01a by M01c	
M02a	week1. income 4th floor	=multiply M01b by M01d	
M02b	total week1. income	=total M01f M02a	
M02c	251 total month1. income	=multiply M01e by M02b	
M02d	348 commissions	=multiply 0.07 by M02c	
M02e	349 Cleaning	=multiply M01e by 60	
M02f	374 Light and heat	:data	
M03a	351 Office rental cost	=multiply M01e by 1481.5	
M03b	Depn leasehold improvements	=multiply 238 by M01e	
M03c	Depn furniture and fittings	=multiply 109 by M01e	
M03d	rent income	=multiply -1 by M02c	
M03e	Space margin	:inactive	

(b) Key page as printed

5.3 Modelling Pages

All data in a financial model, and all rules by which data are transformed and manipulated, are recorded on modelling pages. So modelling pages comprise the essential part of every moneybook. Other pages are for presenting different aspects of the model held on modelling pages; for example a graph page may depict one row of a modelling page as a segmented pie.

5.3.1 Capacity of model

There are 67 modelling pages available for every model. Each page has 6 columns; each column has room for 168 entries. This represents enough capacity for a big model. But when a smaller model is being built the unused pages (and unused ends of columns) do not get in the way.

5.3.2 The two sides

Two sides of a typical modelling page are shown in fig. 3.4. The difference between them is apparent in the third column which contains a formula on the working side, but values derived from that formula on the results side.

Pages of reports are usually graph or presentation pages, but modelling pages may also be included. A modelling page,

when printed, is illustrated in fig. 5.3 (c). This shows the page on its results side. The working side – designed for working at the keyboard and screen – cannot be printed in this manner.

Reference to items 5.3.3

A modelling column is referred to by its page number followed by a letter from **a** to **f**. For example **M23b** denotes the second column on modelling page M23.

Each column has a title as illustrated in fig. 5.3. If the column number is forgotten but the title (or part of the title) remembered then the search facility described in chapter 8 may be used to recall the column number.

A row is referred to by its calendar date. Fig. 5.3 shows how the calendar is displayed down both sides of the modelling page. The starting date is at the top and the calendar runs for 168 time periods to the bottom of the page (as may be verified by scrolling).

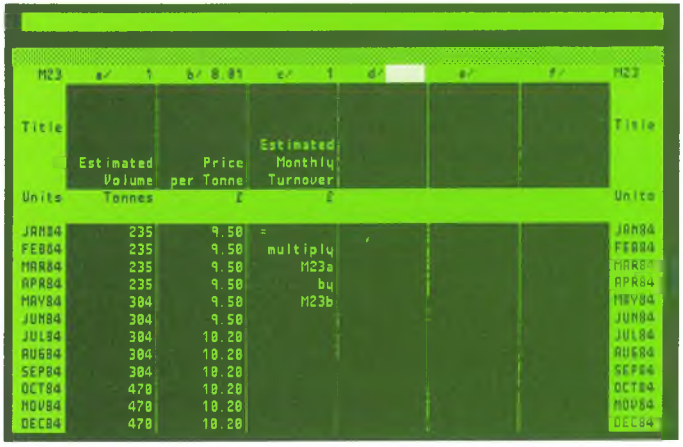
Arrangement of cells 5.3.4

At the top of each column is a cell for an item (a factor) which controls the display of subsequent values in that column. There is also a cell for the column title and a cell for a description of the units in which subsequent values are expressed. These three cells are described individually below.

When items of data are typed at the keyboard they go into the body of a column. For containing these items the column has 168 cells but they need not all be filled. Alternatively the body of the column may be treated as a single cell containing a formula from which values may be derived.

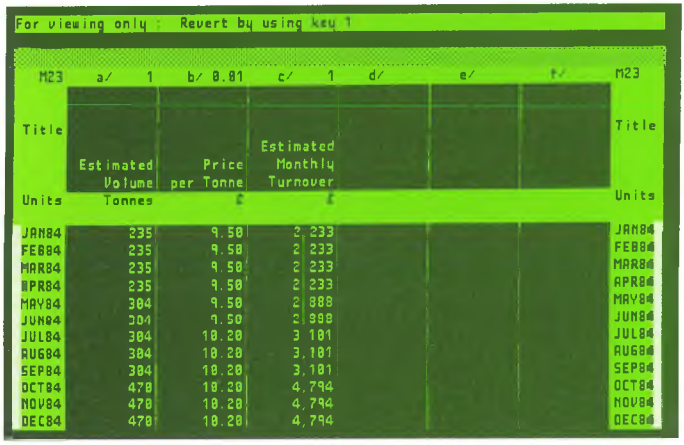
FIG. 5.3
MODELLING
PAGE

(a) Working side



M23	a/ 1	b/ 0.01	c/ 1	d/	e/	f/	M23
Title	Estimated Volume	Price per Tonne	Estimated Monthly Turnover				Title
Units	Tonnes	£	£				Units
JAN84	235	9.50	=				JAN84
FEB84	235	9.50	multiply				FEB84
MAR84	235	9.50	M23a				MAR84
APR84	235	9.50	by				APR84
MAY84	304	9.50	M23b				MAY84
JUN84	304	9.50					JUN84
JUL84	304	10.20					JUL84
AUG84	304	10.20					AUG84
SEP84	304	10.20					SEP84
OCT84	470	10.20					OCT84
NOV84	470	10.20					NOV84
DEC84	470	10.20					DEC84

(b) Results side on screen



For viewing only : Revert by using key 1

M23	a/ 1	b/ 0.01	c/ 1	d/	e/	f/	M23
Title	Estimated Volume	Price per Tonne	Estimated Monthly Turnover				Title
Units	Tonnes	£	£				Units
JAN84	235	9.50	2,233				JAN84
FEB84	235	9.50	2,233				FEB84
MAR84	235	9.50	2,233				MAR84
APR84	235	9.50	2,233				APR84
MAY84	304	9.50	2,888				MAY84
JUN84	304	9.50	2,888				JUN84
JUL84	304	10.20	3,101				JUL84
AUG84	304	10.20	3,101				AUG84
SEP84	304	10.20	3,101				SEP84
OCT84	470	10.20	4,794				OCT84
NOV84	470	10.20	4,794				NOV84
DEC84	470	10.20	4,794				DEC84

(c) Modelling page when printed

M23	a 1	b 0.01	c 1	d	e	f	M23
Title	Estimated Volume	Price per Tonne	Estimated Monthly Turnover				Title
Units	Tonnes	£	£				Units
JAN84	235	9.50	2,233				JAN84
FEB84	235	9.50	2,233				FEB84
MAR84	235	9.50	2,233				MAR84
APR84	235	9.50	2,233				APR84
MAY84	304	9.50	2,888				MAY84
JUN84	304	9.50	2,888				JUN84
JUL84	304	10.20	3,101				JUL84
AUG84	304	10.20	3,101				AUG84

Display factor

When a modelling column is begun the spotlight plays on a cell above the title. It is impossible to move the spotlight further down the column until this top cell has been filled. The item in this cell determines what all the entries in the column will look like when displayed on the screen.

Most modelling columns are for numerical values but some may contain words called 'markers'. The function of markers is illustrated in chapter 7. An example is for marking dates at which subtotals are to be formed. A marker in every sixth row against a monthly calendar would cause a subtotal to be computed for each half year on the dates marked.

The modelling pages reproduced in this manual show columns containing values of various magnitudes. Different magnitudes suggest different representations; a big sum of money might be better shown rounded, for example, as 2,500,000 rather than as 2,500,123. But a small sum would be better displayed with two places of decimals as, say, 27.45. The form of representation is determined for each column by a display factor entered in the top cell.

The display factor may be any from the list below. Its effect depends on the purpose of the column. If it is for storing data typed at the keyboard every item typed must be a precise multiple of the display factor. If the column contains a formula then all results are displayed rounded to multiples of the control factor – despite being *computed* and *stored* to nine significant figures.

The requirement for the top cell is thus:

top cell: Enter M if the column is to contain markers.
Enter a display factor from the list below if the column is to contain numerical values. The allowable display factors are :

.001	.005	.01	.025	.05
.1	.25	.5	1	2.5
5	10	25	50	100
250	500	1000	2500	5000

As an example, assume a display factor of 0.01. Then:

- allowable items typed as data for such a column would be

.02, 0.20, 1.23, −1.23, 1234.56 but not 0.246 because not more than two decimals places are permitted.

■ a value calculated by formula and stored as −9.87654321 would be displayed as −9.88 on the screen.

When a column is used for data, and the display factor subsequently changed to a larger one, then all entries currently in the column are automatically rounded – as though originally typed as multiples of the new (larger) factor. Suppose, for example, the original factor were 10 and the following entries typed: 20, −40, 60, −80. On changing the factor to 100 these entries would become 0, 0, 100, −100. (Setting the control factor back to 10 would cause no further change in the column.)

A potential loss of precision such as that described above would not happen without warning. There is a warning message and a chance to retract.

It would be found impossible to change the content of the top cell from M to a display factor or vice versa. To make such a change it is necessary first to exterminate the column as described in 12.1.4.

5.3.6 Title cell

When the top cell is successfully filled the spotlight moves to the title cell.

Title : Enter a column title up to 51 characters long including spaces.

The title appears, as typed, in the top line of the screen. On pressing **return** the title appears also in the title cell as would be expected. But the program has to fold the text to fit the cell. Folds are made at existing spaces; also at existing hyphens if any. Hyphens are inserted by the program only as a last resort. Should this hyphenation make the title look silly the remedy is to change the wording (edit the top line) and try again by pressing **return**.

A title is obligatory; it would be found impossible to move the spotlight down from an empty title cell.

Units cell	When the title cell is successfully filled the spotlight moves to the units cell. **Units :** Enter a word or number to describe the units in which the column entries are expressed (e.g. Dollars). Up to ten characters are allowed in the description. The units cells may be left blank if desired. The word or number entered has no intrinsic significance. For example, changing Dollars to Roubles would have no effect on the values in the columns. However, it is well to be consistent; for example do not enter DOLLARS in one column, Dollars in another and $ in another. This is because of a useful scaling facility, described in 9.8, which may be applied to groups of columns.	5.3.7
Body of column	As previously explained a column may contain either data or a formula. Entering an item of data against any date establishes the column as a *data column*. Entering a formula establishes the column as a *calculated column*. It all depends on which is done first. **First entry in column :** Set the spotlight on any of the 168 cells and enter an item of data. Alternatively enter a formula. Having entered an item of data it would be found impossible to enter a formula subsequently. Conversely, having entered a formula it would be found impossible to enter an item of data. Nevertheless the column may be changed from one kind of use to the other by deactivation as described in 6.2. A data column has 168 cells, all of which may be seen by scrolling. This is done by moving the spotlight up or down. Entering data is described in detail in 3.2; generating data automatically in 6.4. Entering formulae for deriving results from entries in other columns is described in chapter 7.	5.3.8
Summary Pages	There may be many modelling pages being used in a particular financial model so it may be awkward to compare columns when they are on different pages far apart. However, it is possible to copy selected modelling columns and arrange the copies side by side on summary pages.	**5.4**

5.4.1 The two sides

Two sides of a typical summary page are shown in fig. 3.4. On the working side are six cells to identify columns from the modelling pages. It is not necessary to use all six cells. On the results side the columns appear just as they do on the results side of modelling pages.

5.4.2 Uses

There are two reasons for defining a summary page. The first is to display selected modelling columns side by side for easy comparison of figures. A copy of any one modelling column may be displayed on any number of summary pages.

The second use is to assemble data from various modelling pages for transfer to another moneybook. The transfer is made by moneypost as described in 1.4. A moneypost need be no more than a few summary pages.

5.4.3 Title cell

Across the top of the working side of every summary page is a title cell. A page number (for example S02) is shown at either end.

title cell : Enter a title. This may be up to 51 characters long including spaces. This cell may not be left blank.

The title entered in this cell is used to identify the summary page when displayed or printed. This title is also quoted on the contents page.

5.4.4 Column numbers

The row of six cells on the working side is for column numbers. Cells may be left blank.

column-number cell : Enter the number of a modelling column. Alternatively, to remove an unwanted column number from the cell, enter a blank.

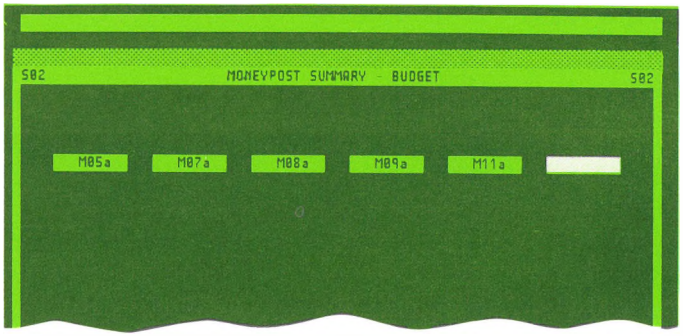
An example of a column number is M05b denoting the second column of modelling page 5.

It would be found impossible to enter the number of a modelling column which had not yet been given a title.

It is easy to find numbers of columns when titles (or fragments of titles) are known. This is done using the search facility described in chapter 8.

FIG. 5.4
SUMMARY
PAGE

(a) Working side



(b) Results side on screen

For viewing only - Revert by using key 1

S02 MONEYPOST SUMMARY - BUDGET S02

Title		VOLUME-BUDGET	TURNOVER-BUDGET	GROSS PROFIT-BUDGET	COSTS-BUDGET	CASH FLOW-BUDGET		Title
Units		TONNES	£	£	£	£		Units
	1	675	6,075	2,869	875	1,737		1
	2	675	6,075	2,869	880	1,993		2
	3	675	6,075	2,869	919	1,982		3
	4	675	6,075	2,869	889	1,955		4
	5	675	6,075	2,869	893	1,979		5
	6	675	6,075	2,869	933	1,969		6
	7	675	6,075	2,869	902	1,941		7
	8	675	6,075	2,869	907	1,966		8
	9	675	6,075	2,869	946	1,955		9
	10	675	6,075	2,869	916	1,928		10
	11	675	6,075	2,869	920	1,952		11
	12	675	6,075	2,869	960	1,942		12

(c) Summary page when printed

S02 MONEYPOST SUMMARY - BUDGET S02

	M05a 1	M07a 1	M08a 1	M09a 1	M11a 1		
Title	VOLUME-BUDGET	TURNOVER-BUDGET	GROSS PROFIT-BUDGET	COSTS-BUDGET	CASH FLOW-BUDGET		Title
Units	TONNES	£	£	£	£		Units
1	675	6,075	2,869	875	1,737		1
2	675	6,075	2,869	880	1,993		2
3	675	6,075	2,869	919	1,982		3
4	675	6,075	2,869	889	1,955		4
5	675	6,075	2,869	893	1,979		5
6	675	6,075	2,869	933	1,969		6
7	675	6,075	2,869	902	1,941		7
8	675	6,075	2,869	907	1,966		8
9	675	6,075	2,869	946	1,955		9
10	675	6,075	2,869	916	1,928		10
11	675	6,075	2,869	920	1,952		11
12	675	6,075	2,869	960	1,942		12

5.5 Graph Pages

Graph pages are for displaying nominated modelling columns graphically. There are three ways of displaying modelling columns :

- as conventional line graphs with the time axis running from left to right
- as a bar graph (a histogram) also with a horizontal time axis
- as a segmented pie.

All three kinds of graph are illustrated here.

To create a graph page it is necessary only to indicate which kind of graph is wanted, nominate the modelling columns involved, and specify dates. The rest (scaling, labelling axes, arrangement of the page) may be left to the system.

5.5.1 The two sides

The working side of a graph page is first seen to contain a title cell and another small cell for specifying the type of graph wanted. Depending upon the type entered (line, bar or pie) other cells appear as appropriate. The three arrangements on the working side are shown in fig. 5.7 to 5.9.

The results side is, of course, the graph itself. Graphs are depicted in the figures quoted above.

5.5.2 Title cell

Across the top of the working side of every graph page is a title cell. A page number is shown (for example G03) at either end.

title cell : Enter a title. This may be up to 51 characters long including spaces. This cell may not be left blank.

The title entered in this cell is used to identify the graph page when displayed or printed. This title is also quoted on the contents page.

5.5.3 Type of graph

The second cell is for specifying what kind of graph is wanted :

GRAPH TYPE : Enter the word Line or Bar or Pie according to the type required. It is not necessary to use capital letters or complete the word, the initial letter is enough.

New cells then appear on the screen. These are appropriate to the type of graph chosen.

It is permissible to display the working side of a completed graph page then change the contents of just this cell to see the same data graphed differently.

Dates

The dates entered in the next two cells are interpreted differently according to the type of graph. On line graphs and bar graphs the dates define, respectively, the origin and end of the time axis. But pie charts do not have a time axis; dates have a different interpretation. Entering only one date indicates that one pie is to be drawn; entering two dates implies two pies on the page. 5.5.4

DATES : For lines or bars enter the date at the origin and at the end of the time axis. For one pie on the page enter the date of the pie (in either cell).

For two pies on the page enter the date of each pie. The dates entered in these cells must have the same form as dates in the moneybook.

Bar graphs may have up to 30 intervals on the time axis. For example, from JAN81 any date up to JUN83 may be entered in the second cell. Line graphs may have up to 60 intervals on the time axis.

Column numbers

The next row of cells is for column numbers : 5.5.5

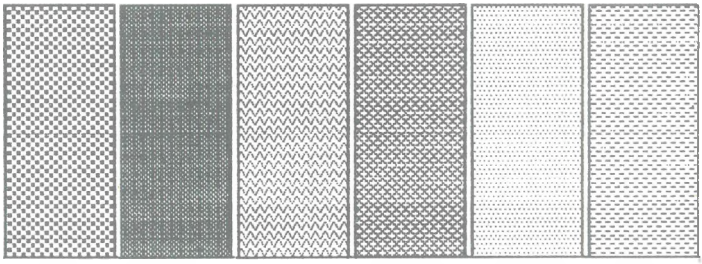
COLUMN NUMBER : Enter the number of the modelling column to be graphed. An example is M05b which denotes the second column on modelling page 5.

It is not necessary to put a column number in every cell in the row. On a line graph up to three columns may be graphed; on a bar graph or pie chart up to six columns may be represented.

Fig. 5.5 illustrates the patterns employed to distinguish one area from another. A pattern is associated with a particular column by putting the column number in the cell labelled with the word *check*, *gauze*, *wavy* and so on, according to the pattern desired. The same principle applies to the type of line in a line graph.

FIG. 5.5
PATTERNS OF SHADING AND LINE

(a) Shading patterns



(b) Types of line

5.5.6 Bar ordering & stacking

The following is unique to bar graphs.

Assume a modelling column headed 'salaries' and another headed 'overheads'. A bar graph designed to compare these expenditures would show the respective bars side by side in each time period. On the other hand a graph designed to illustrate total expenditure would show the respective bars one on top of the other. The desired arrangement may be specified as described below.

In each time period there is, in general, a group of bars. In each group there may be up to six bars side by side, or up to six bars stacked vertically, or up to six bars of which some are arranged side by side and some stacked vertically.

For specifying the desired pattern the bars are given relative positions. The sideways position of each bar is specified by a number from 1 to 6, the lateral order being from left to right. The stacking level is specified by a number from 1 to 6 running upwards.

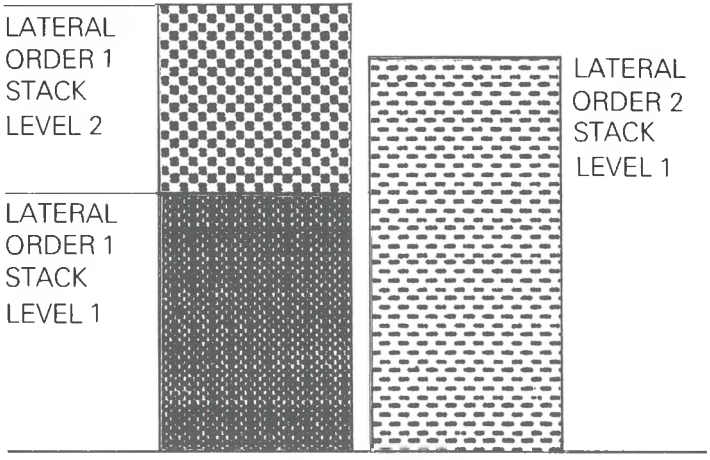
Returning to the previous example, when 'salaries' and 'overheads' are to be presented side by side in pairs 'salaries' may be given a lateral order of 1 and 'overheads' a lateral order of 2. The stacking level is not relevant.

To present 'salaries' stacked on top of overheads 'salaries' should be given stacking level 2 and 'overheads' stacking level 1. Each must be given the same lateral order.

The lateral and stacking positions described above are relative rather than absolute. Thus in the example immediately above the stacking levels could have been given as 6 and 1 (say) instead of 2 and 1.

Stacking level is not relevant to the first example above; lateral order is specific to the second. But it is possible to design a bar graph in which lateral and vertical orders are simultaneously relevant; for example two bars side by side and a third on top of the left-hand bar. This case is illustrated diagrammatically in fig. 5.6 which indicates the lateral order and stacking level to be allocated to each bar.

FIG. 5.6
LATERAL AND VERTICAL ORDER



LATERAL ORDER : Leave blank if not relevant.
Leave blank if the lateral order is to be the same as the order of column numbers across the screen. Otherwise enter a number from 1 to 6 to signify the relative position of this bar in the group. The smallest number signifies the leftmost bar.

When two or more bars in the group are given the same number for lateral order this means they share the same position and have to be stacked.

STACK LEVEL : Leave blank if not relevant.
Otherwise enter a number from 1 to 6 to signify the stacking level of this bar relative to others in the same lateral position. The smallest number signifies the bottom bar.

If both rows of cells are left blank it implies a side-by-side arrangement as though the lateral order cells contained 1, 2, 3, . . . and the stacking level cells contained 1, 1, 1, . . .

It is possible for the unwary to specify an inconsistent pattern of data in these two rows of cells. For example, 1, 1, 1, . . . for lateral order would say all bars were to share the same lateral position; in other words sit on top of one another. So it would be silly to specify 1, 1, 1, . . . for stacking level also. In such a case the program would override the impossible specification by stacking the bars as though stacking levels had been specified as 1, 2, 3, . . .

5.5.7 Unit bars

The heights of bar shown in fig. 5.8 vary from one time period to the next, having been scaled automatically so that the tallest would fit the page. However, the bars may be plotted all to the same unit height instead. The resulting bar graph would then show how proportions (rather than absolute values) vary with time. Each bar would serve the same purpose as a pie chart but with layer-cake effect rather than a circular pie. The vertical scale against the layer cake is graduated from zero to unity.

This facility is useful only where bars are stacked on top of each other.

UNIT BARS : Enter yes or no (y or n for short) to indicate whether bars are all to be plotted to the same unit height or not. Alternatively leave blank to signify no.

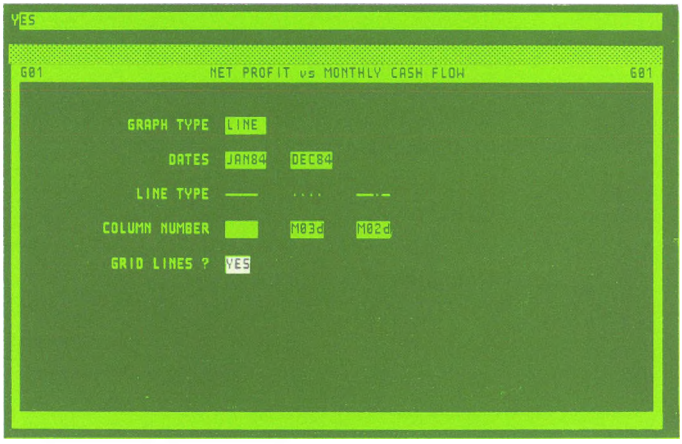
Grid lines

It is possible to have a grid superimposed on a line or bar graph. A grid is illustrated in fig. 5.7. A grid is useful if the bar graph is intended to be used quantitatively rather than qualitatively. In other words a grid is advisable if actual values are going to be read off the graph. 5.5.8

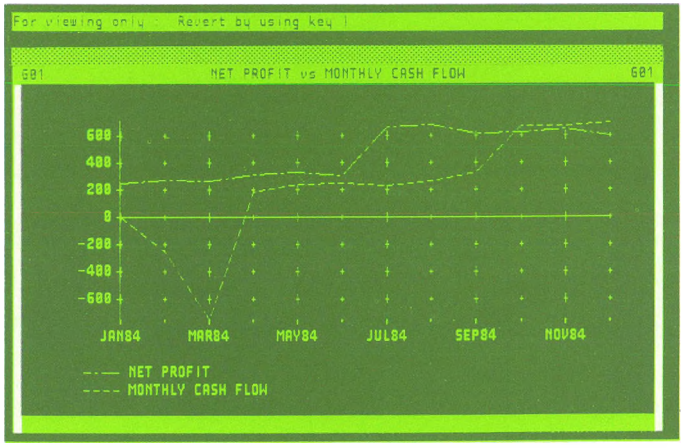
GRID LINES : Enter yes or no (y or n for short) to indicate whether a grid is wanted or not. Alternatively leave blank to signify no.

FIG.5.7
LINE GRAPH

(a) Working side



(b) Results side on screen



(c) Graph page (line) when printed

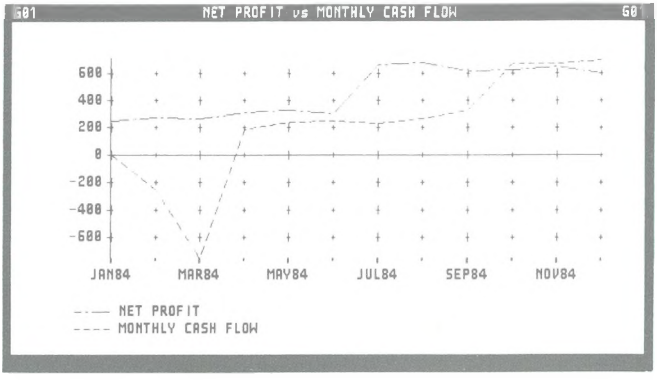
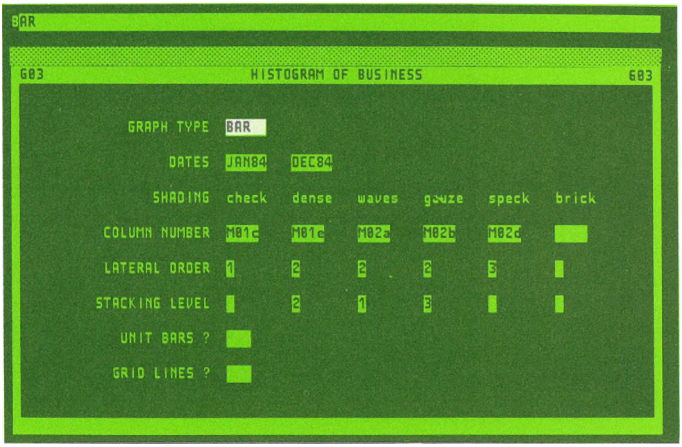
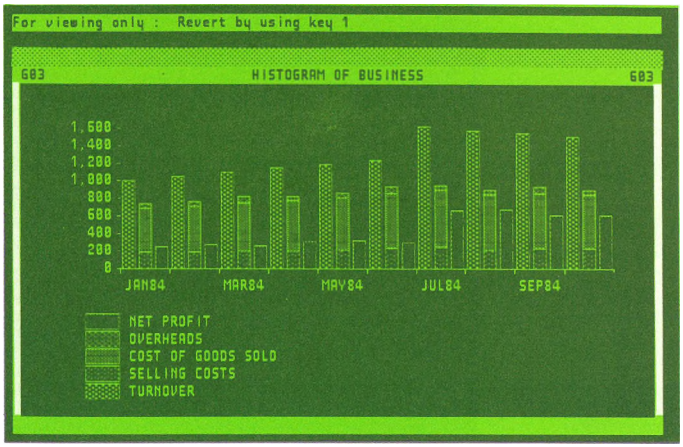


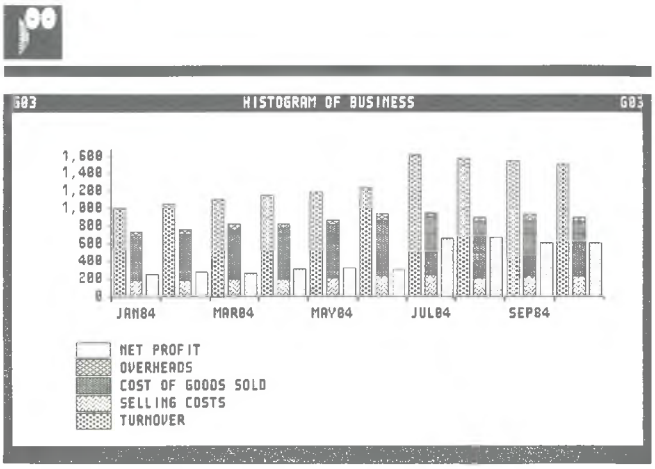
FIG. 5.8
BAR GRAPH



(a) Working side



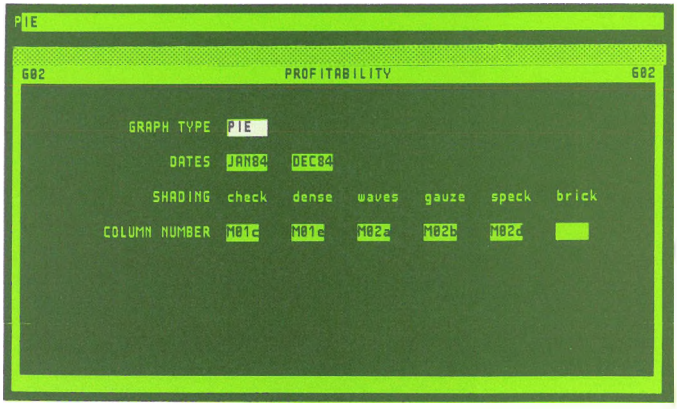
(b) Results side on screen



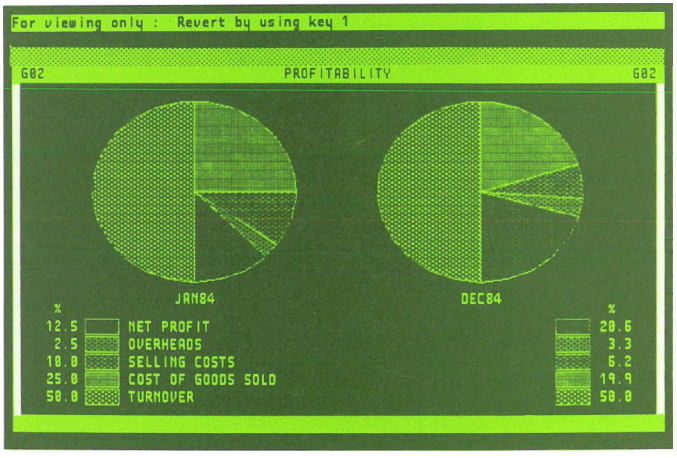
(c) Graph page (bar) when printed

FIG. 5.9
PIE CHART

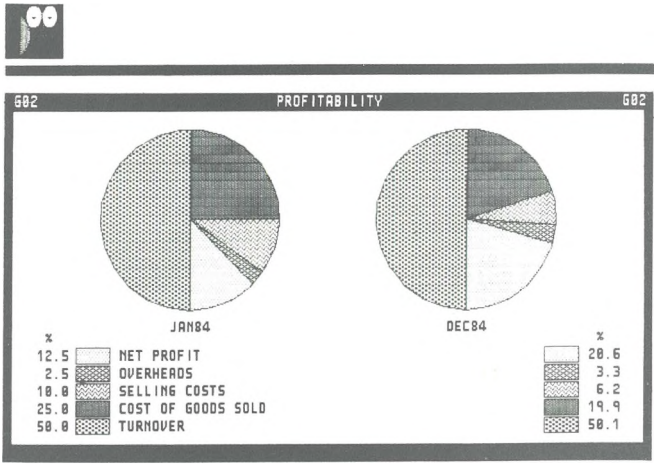
(a) Working side



(b) Results side on screen



(c) Graph page (pie) when printed



Presentation Pages

5.6

Any page in the moneybook may be printed on paper as well as displayed on the screen. Apart from the presentation page every other kind of page has a standard layout appropriate to its function. But a presentation page may have any layout desired.

A company may have a house style in which its financial reports are prepared; such house styles may be defined on presentation pages. The scope of possible page designs is too wide to be covered by example but fig. 5.10 should be enough to illustrate the potential available when designing a presentation.

The two sides

5.6.1

Two sides of a typical presentation page are illustrated in fig. 5.10. The working side comprises:

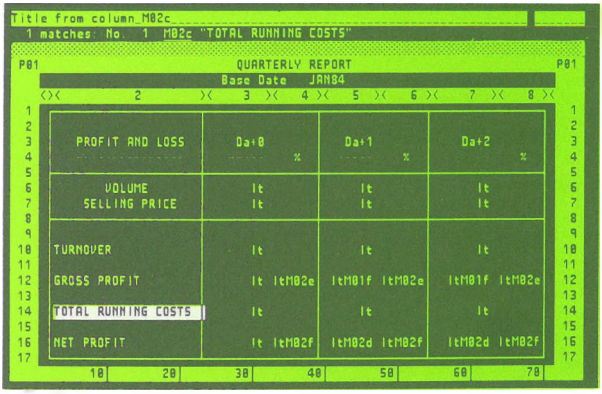
- title cell
- a base-date cell
- a 'window' onto a block of cells.

The block of cells is 28 cells wide and 71 cells deep. Initially all are empty. This block of cells is destined for printing. However, the title and the base date are not printed.

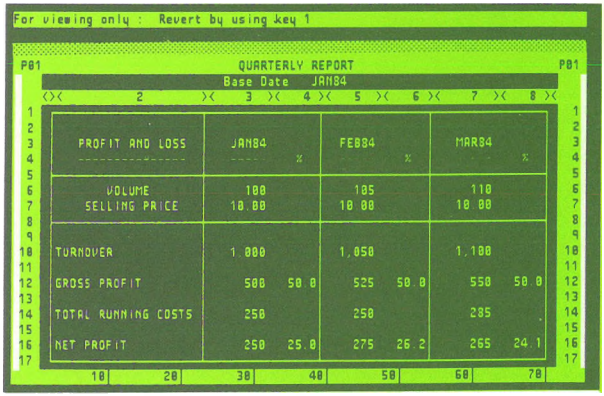
Each cell in the block may hold a definition of what should appear in the corresponding position on the results side of the page. This may be a column title, a value from a modelling column, a horizontal line, a date, or other feature.

Having defined what is to appear in the corresponding position on the results side it is a simple matter to turn over, by pressing f1, to check that it is really there.

FIG. 5.10
PRESENTATION PAGE



(a) Working side



(b) Window view to results side

PROFIT AND LOSS	JAN84	%	FEB84	%	MAR84	%
VOLUME	100		105		110	
SELLING PRICE	10.00		10.00		10.00	
TURNOVER	1,000		1,050		1,100	
GROSS PROFIT	500	50.0	525	50.0	550	50.0
TOTAL RUNNING COSTS	250		250		285	

(c) Presentation page when printed

Arrangement	The block of cells is 28 wide and 71 deep. But this does not imply a fixed width of column on the page; widths may be altered individually. Fig. 5.10 illustrates a presentation page with the first column wider than the others. And cells may be joined to one another so that a column heading, for example, may be made to span two or more columns of figures. Lines may be ruled horizontally and vertically wherever they are wanted. It is enough to specify which cells have the lines; the program joins up all corners automatically. Fig. 5.10 illustrates ruled lines.	5.6.2
Size of paper	The presentation page is normally too big to be seen on the screen all at once. The screen is a window which may be moved over the page horizontally or vertically under control of the spotlight keys.	5.6.3
Title cell	Across the top of the working side of every presentation page is a title cell. A page number is shown (for example P02) at either end. **title cell** : Enter a title. This may be up to 51 characters long including spaces. This cell may not be left blank. The title entered in this cell is used to identify the presentation page on the screen and is also quoted on the contents page. This title is not printed.	5.6.4
Base date	Below the title is a cell for the base date. The base date is not printed. A presentation page includes many items each of which is associated with a date. For example, a cash-flow forecast has the months of the year written across the page; each column of figures is thus associated with a different date. It is usual (but not essential) to specify all such dates *relatively* to a single base date as described later. The advantage in doing so is that the time span of a presentation page may then be shifted (say from APR84 to APR85) by a single change to the base date. Even when dates on the presentation page are not given relative to a base date it is still necessary to enter a base date in	5.6.5

this cell; a blank is not permitted. Initially this cell is automatically primed with the starting date of the moneybook.

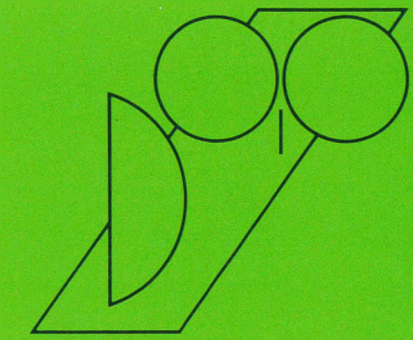
base date : If the date already in this cell is the required base date press **return** otherwise enter the required base date. The base date should have the same form as dates in the moneybook.

5.6.6 Body of page

The body of the presentation page comprises a matrix of cells. Initially these cells are empty. Into any cell may be put :

- a date, absolute or relative to base date
- a text, left or right justified or centered
- the title from a modelling column
- a description of units (e.g. Dollars) copied from a modelling column
- an item copied from a specified modelling column
- a scaling legend
- the total made by adding any sequence of items in a modelling column
- the difference between any two items in a modelling column
- a straight line ruled horizontally or vertically.

Techniques for achieving the above are described in chapter 9.



6

Modelling Data

Modelling Data

6

Data for a model are entered in modelling columns for subsequent manipulation. There are two ways by which an item of data may be entered from the keyboard :

- typed directly
- generated automatically from the value above it.

This chapter describes the allowable forms of entry (number or marker) that may be typed directly. It also explains how to use automatic generators by which regular sequences of entries may be placed in successive cells.

Kind of Column

6.1

Not all columns are able to receive data typed at the keyboard. Marker columns are able to receive markers, data columns are able to receive numbers, but calculated columns are unable to receive either. The various kinds of column are summarized below.

Numbers versus markers

6.1.1

A modelling column is designated a marker column or number column according to what is initially put into the cell above the title. In the top cell :

- M signifies a marker column, its entries being words rather than numbers
- any display factor signifies a number column (display factors: .001, .005, .01, and so on are tabulated in 5.3.5).

It is impossible to put words into a column of numbers or vice versa. To change such fundamental use of a column it has to be 'exterminated' and defined afresh. The means of extermination are described in 12.1.4.

Data versus calculated columns

6.1.2

There is a further distinction among columns of numbers. A column of numbers may be :

- a data column; in other words a column which receives entries typed at the keyboard
- a calculated column; a column containing a formula by which implied entries are derived from other columns.

The distinction is made by putting either a number or a formula into a column which has not yet been used. Such a column is said to be 'inactive'. To change a data column to a calculated column it is necessary to 'deactivate' the column first.

6.1.3 Summary

The three kinds of column defined above are :

- marker column
- data column
- calculated column.

6.2 Deactivation

A column cannot be changed from a data column to a calculated column until it is deactivated. To deactivate a data column:

- direct the spotlight anywhere in the dated part of the column to be deactivated
- type the letters de

The top line should now show :

```
Deactivate_
```

At this stage the process of deactivation may be abandoned by moving the spotlight off the threatened column, but to proceed:

press **return**

The body of the column should now appear blank, the display factor, title and units remaining as they were. In this state it is possible to enter either an item of data or a formula and so re-define the column as a data column or calculated column.

6.3 Kinds of Entry

A data column requires numbers; a marker column requires markers. Numbers and markers are defined below. The absence of a number or a marker is signified by a dash. Entries which are dashes are also defined below.

Numbers	Every number entered in a data column must be a multiple of the display factor for that column. The display factor is in the cell above the title. As an example, if the display factor is 10 then −120, −10, 0, 10, 30, 45,670 are all acceptable items. The program would not accept 12, 10.5 or −25. The magnitude of any number typed at the keyboard should be less than ten million times the display factor. Thus with a display factor of 10 acceptable numbers lie in the range −99,999,990 to +99,999,990. (5 or 25 in the display factor counts as 1 when computing an allowable magnitude.) Numbers typed at the keyboard should have no more than three decimal places and no more than seven significant digits. When typing a number it is permissible to include commas in the conventional places; specifically every three digits leftwards from the decimal point. For example 1234567000 may be typed 1,234,567,000 without error. It would be found impossible to include commas in places other than those defined.	6.3.1
Markers	Marker columns have a letter M in the cell above the title in place of a display factor. A marker column may contain only markers in its cells. A marker is a text comprising up to 51 characters including spaces – just as in a column title. Marker columns are ten spaces wide, therefore long markers are not seen in their entirety when a modelling page is displayed on the screen. Only their first ten characters are displayed. But if the spotlight is moved onto a row of the marker column the marker in that row appears full length in the top line of the screen for inspection. The absence of a number or marker is indicated by a dash (a minus sign).	6.3.2
Dashes	When a column is inactive the body of the column consists of blank cells. But as soon as an item of data is put into any one of those cells all the other cells automatically become filled with dashes. The item initially entered may itself be a dash – after which every cell in the column would contain a dash.	6.3.3

A number may be changed to a dash by spotlighting the cell, putting a minus sign alone in the top line, and pressing **return**. The same applies to a marker in a marker column.

A dash in a number column is treated as zero when involved in the arithmetic of a formula (for example when adding two columns in which some entries are dashes).

6.4 Generated Sequences

In a typical model there are columns of figures that display a regular pattern. At its simplest, a column headed 'Monthly Salary' might have precisely the same figure in every row. A column headed 'Loan', on the other hand, might show a more complicated pattern; an initial sum growing at a specified rate according to the law of compound interest.

Sequences such as those mentioned above may be generated automatically using the generators described below. Generators not only save the tedium of typing the same number over and over again, they also avoid the errors that occur when a complicated formula is resolved repeatedly on a hand calculator.

Every generator is applicable to a whole column or part of a column. The generators are :

- Grow: apply the compound interest formula to successive entries at a specified rate

- Interpolate: fill in missing entries between a given pair of entries by linear interpolation

- Repeat: copy a given entry, or sequence of entries, repeatedly

- Step: add a fixed increment to each entry so as to create the next.

The rest of this section explains the use of these generators.

Starting position of spotlight	Each value in a sequence is generated from the value above it. It follows that no sequence could be generated unless there were already a 'base' value above it. To generate any sequence the spotlight should first be moved to the cell where its first element is to be placed – this cell being immediately below the base value referred to above. (If the spotlight is moved to the top of a column there is an implied dash above it.)	6.4.1
Selecting a generator	With the spotlight on the first cell two initial letters of the generator should be typed: **gr, in, re, st** to signify grow, interpolate, repeat, step respectively. The top line is then filled in automatically but with gaps for data to be supplied. The effect of entering data in these gaps is explained separately for each generator below. Some of the gaps are for items which eventually appear in the column. Such numbers should be multiples of the display factor shown above the column title. Other gaps are for small integers. Having filled all the gaps the generator is started by pressing **return**.	6.4.2
Stretching the sequence	Having successfully started the generator the spotlight may be moved downwards. (Conversely, moving the spotlight upwards – above its starting position – causes the generator to be abandoned.) Each time the down key is pressed the spotlight moves down one cell but cells left behind remain spotlit. Thus a bright rectangle extends down the column. Inside this rectangle may be seen the sequence of values generated from the base value. (The base value is the one immediately above the rectangle.) The sum of the values in the rectangle is continually displayed at the end of the top line for inspection. The rectangle may be further stretched by moving the spotlight down or compressed by moving the spotlight up again. As the rectangle stretches it covers any items already in the column; as the rectangle is compressed again these entries reappear.	6.4.3

The values generated are calculated to full precision, then rounded to the nearest multiple of the display factor shown above the column title. It is just as if the user had calculated these values and typed them. They would be stored to the precision shown on the screen.

When the sequence has the required span it may be frozen by pressing **return**. The top line is then cleared automatically and the spotlight reduced to a single cell.

6.4.4 Grow

The top line shows :

grow from item above spotlight at_ _%(per_ _intervals)

In colloquial speech a rate of interest of 'seven and a half percent' means 7.5% per annum. But it is not enough to enter just 7.5 in the first empty gap because 'per annum' is *not* implied; the relative time span must be given in the second gap. If the moneybook has a monthly calendar, and 7.5% per annum is intended, then the number to enter is 12. On the other hand if 7.5% per month is intended then the number to enter is 1. Leaving this gap blank implies 1 by default.

The following illustrates a stretching sequence when the rate is 7.5% per 12 entries on a base value of 100.00 :

100.00	100.00	100.00	100.00
100.60	100.60	100.60	100.60
	101.21	101.21	101.21
		101.82	101.82
			102.44

6.4.5 Interpolate

The top line shows :

interpolate between item above spotlight and_ _____

The figure entered in the empty gap appears immediately in the spotlight and remains as the last value as the sequence is stretched. Values between are interpolated linearly.

The spotlight may start in the top row in which case the 'above item' is assumed to be a dash.

The following illustrates a stretching sequence when the value in the gap is 200.00 :

100.00	100.00	100.00	100.00
200.00	150.00	133.33	125.00
	200.00	166.67	150.00
		200.00	175.00
			200.00

Repeat

The top line shows : 6.4.6

repeat the block of_ _(no.) items above spotlight

This is a simple copying process. When the value in the gap is 1 then the base value (the one above the original spotlight position) is copied into every cell of the stretching rectangle.

Entering a value such as 4 implies repeating the 4 values originally above the spotlight. It does not matter if there were less than 4 values originally above the spotlight because there is an implied column of dashes there.

The following illustrates a stretching sequence of 3 entries. There were originally only two cells above the spotlight; they contained 10 and 20 as illustrated :

10	10	10	10	10
20	20	20	20	20
-	-	-	-	-
10	10	10	10	10
	20	20	20	20
		-	-	-
			10	10
				20

Step

The top line shows : 6.4.7

step in increments of_ _from item above spotlight

This is a simple sequence in which the increment supplied is added to the current value to get the next. The increment may be negative.

The following illustrates a stretching sequence when the increment specified in the gap is 2.5 :

10.0	10.0	10.0	10.0
12.5	12.5	12.5	12.5
	15.0	15.0	15.0
		17.5	17.5
			20.0

If the initial position of the spotlight had been the top cell then the sequence would be 2.5, 5.0, 7.5, . . . because of the implied dashes above the top cell.

7

Modelling Formulae

Modelling Formulae

A modelling column may contain a formula by which its entries are to be calculated. The formula is expressed on the working side of a modelling page as a cryptic sentence such as : 7

```
=
    add
  M23a
    to
  M23b
```

denoting other modelling columns (M23a and M23b) which are to be added, row by row, to produce entries for the column in which the formula appears. The page may be turned over to see the results as a column of numbers in place of the formula.

This chapter describes all available formulae and explains how to use them.

Calculated Columns

The various kinds of modelling column are defined in 6.1. They are : 7.1

- marker column
- data column
- calculated column.

The columns containing formulae are calculated columns. An inactive column is made into a calculated column by putting a formula into it. Such a column must have a display factor in the cell above the title. This display factor (.001, .005, .01 and so on, as listed in 5.3.5) determines the form of number displayed on the results side of the modelling page but not the precision to which the number is calculated.

There can be only one formula in a calculated column. If a second formula is entered, as later described, it replaces the formula already there. It is impossible to enter data in a calculated column; to do this the column must first be deactivated so that it is no longer a calculated column.

7.2 Deactivation

Deactivation is described in 6.2 in the context of data columns. The following procedure is for calculated columns.

With the spotlight on the column to be deactivated type =de. *The top line should then show :*

```
=deactivate
```

To proceed press return. Otherwise move the spotlight off the threatened column.

The deactivated column may then be made into a calculated column by entering a formula or made into a data column by entering an item of data.

7.3 Selecting a Formula

Each formula begins with an equals sign. The rest of the formula is shown in the form of a sentence with gaps to be filled. Every formula is composed in the top line. When it has been composed it is automatically folded into the body (the dated part) of the column on the working side of the page. This happens on pressing return.

An example of a formula in the top line is :

```
=add__ _M23a_ _to_ _M23b_ _____
```

This is the formula shown at the beginning of this chapter in its folded form – as it would appear in the body of a modelling column.

To select one of the available formulae, type an equals sign followed by the first two letters of the keyword (=ad in the example above). The rest of the top line then appears automatically with one or more gaps to be filled from the keyboard.

Use of the keyboard for filling gaps in the top line is explained in 3.3. Briefly, use right and left to move the cursor from one gap to the next.

The formula in the top line contains gaps for items of data typed at the keyboard. When a gap is not left blank the item may be either of the following :

- a column number, for example M23a, to denote a column of values
- a value, for example 12.5 or −16.

A value should have no more than seven significant figures with no more than three of them after the decimal point (if any).

When a value is entered in a gap in place of a column number it is equivalent in effect to a column containing this single value in every row.

A value is not permitted in any gap in any of the following formulae :

=average

=maximum

=minimum

=total

Other items to be put in the open gaps are described in the context of individual formulae. When these other items are words it is usually enough to type the initial letter but the first two letters are necessary to distinguish maximum from minimum.

A value may be positive or negative. A value with no preceding sign is positive; a preceding minus sign signifies a negative value as one would expect. But a column number may also be preceded by a minus sign. This minus sign signifies the opposite of every value in the nominated column. Positive values are then treated as though they were negative; negative values as though positive. (No changes are made in the nominated column itself.)

In formulae for average, maximum, minimum and total it is permissible to specify a **range** of column numbers. A range is specified by entering two column numbers separated by the word 'to'. For example **M12f to M12a** which occupies three successive gaps. In this example the range signifies the six columns M12a to M12f inclusive. More than one range may be specified in a single formula.

The first column number to specify a range may be preceded by a minus sign; for example **−M12a to M12f**. The minus sign here implies a minus sign in front of every column number in the range.

7.5 The Formulae Defined

The formulae are individually described later; below is a list of their keywords and structure. The list is alphabetical, as is the subsequent presentation.

The % in braces indicates that the gap may be left blank or contain %. Words in braces show options, one of which must be entered.

In every case the effect of a formula is to form a new column of results which may be seen by turning the modelling page over. The formula itself remains on the working side.

Here is a summary of the formulae :

=add_ _to_ _____

=average_ __ __ __ __ __ __ __ __ __

=brought forward_ _then_ _____

=compound_ _with_ _at_ _%

=divide_ _by_ _(%) _____

=if_ _is_ {more / less _ / other} _than_ _use_ _otherwise__

=interest at_ _%_ _on__ {credit / debit} __balance of_ __with_ _____

=maximum_ __ __ __ __ __ __ __ __

=minimum_ __ __ __ __ __ __ __ __

=multiply_ _by_ _%_ _____

=periodic_ {average / maximum / minimum / total} _of_ _between entries in__

=present value of_ _discounted at_ _% per_ _intervals

=rate_ _% per_ _intervals

=realize_ _at_ _% after_ _intervals

=round_ _with_ _to nearest_ _____

=shift_ _by_ _____

=spread_ _by_ _% through_ _intervals

=subtract:_ _minus_ _____

=tax_ _%_ _of_ _____

=total_ _ _ _ _ _ _ _ _ _ _____

=value_ _____

These formulae are described individually below.

Add

7.5.1

The top line shows :

=add_ _to_ _____

The effect is to create a column whose entries are the sum of corresponding elements in the nominated or implied columns.

Example:

=add_ _−3_ _to_ _M11a_____

Result	Implied	M11a
2	−3	5
7	−3	10
12	−3	15
17	−3	20

(The same result could be achieved using Subtract instead of Add but with +3 in the second gap.)

Average

7.5.2

The top line shows :

=average_ _ _ _ _ _ _ _ _ _ _

where column numbers (not values) should be put into the gaps. Any gaps may be used.

Results are formed by taking the average (the arithmetic mean) of elements in corresponding rows of the nominated columns. Items which are dashes are ignored during this process, not treated as zero.

Example:

=average__M11c____M02a__ __M02b__ — —

Result	M11c	M02a	M02b
14.00	10	30	2
2.67	10	−6	4
5.00	10	0	5
7.50	10	–	5

7.5.3 Brought forward

The top line shows :

=brought forward_ _then_ _____

The first gap is filled with a value.

The effect of the formula is to create a special column called a **brought-forward** column. This column has the value specified in the first gap as its initial entry; remaining entries are all equal to the value given in the second gap or reproduced from the column nominated in the second gap postponed by a single time interval.

Example:

=brought forward__100__then_ _____

Result	Implied
100	–
–	–
–	–
–	–

An example of the above brought-forward column in use is given in 7.5.4.

The top line shows :

=compound_ _with_ _at_ _%

In its simplest application the first and third gaps are left blank; the column nominated in the second gap being summed down to each successive entry, in other words accumulating that column.

Example 1:

=compound_ _with__M26a__at_ _%

Result	M26a
10	10
20	10
30	10
40	10

The above result would be identical if the value 10 had been entered in the second gap in place of M26a.

A value may be entered in the first gap to give a starting point of compounding.

Example 2:

=compound__100__with__M26a__at_ _%

Result	M26a
110	10
120	10
130	10
140	10

A rate of compound interest may be entered in the third gap. In any one time interval the full rate is applied to the amount accumulated to the end of the previous interval, but only half the rate to the movement in the current interval.

Example 3:

=compound__100__with__M26a__at__20__%

Result	Implied	M26a	Implied	
131.00	100	10	20	i.e. 120%×100.00+110%×10
168.20	100	10	20	120%×131.00+110%×10
212.84	100	10	20	120%×168.20+110%×10
266.41	100	10	20	120%×212.84+110%×10

As explained earlier a gap may contain a column number or a value. In the above example the interest rate of 20 could be replaced with a column number denoting a column of varying interest rates. Also the value of 100 could be replaced by a column number whose first entry would supply the value to be used.

The compound formula has a special use in conjunction with a brought forward formula as demonstrated in the next example.

Example 4:

M26b =compound__M06f__with__M26a__at__20__%

M06f =brought forward__100__then__M26b_____

Apparently M26b and M06f have looped definitions and therefore would be incapable of resolution. But provided that these are the only two columns forming a loop then results would be forthcoming.

Result(M26b)	Result(M06f)	M26a	Implied
131.00	100.00	10	20
168.20	131.00	10	20
212.84	168.20	10	20
266.41	212.84	10	20

7.5.5 Divide

The top line shows :

=divide_ _by_ _ _____

Results are formed by dividing corresponding elements in the first nominated column by those in the second.

The third gap – the little one – may be left blank or a percentage sign inserted. A percentage sign in this gap has the effect of multiplying all results by 100. Thus in the example below the first result would be 100.00 rather than 1.00, and similarly for the remaining results.

Example:

=divide__10__by__m03e__ _____

Result	Implied	M03e
1.00	10	10.00
−1.00	10	−10.00
*	10	0.00
1000.00	10	0.01

An asterisk is displayed on the results side because of division by zero.

If

The top line shows :

=if_ _is_ _than_ _use_ _otherwise_ _____

In the second gap should be entered the initial letter of one of the following words :

more

less

other

In all other gaps should be a column number or value. An empty gap signifies a dash; hence an implied column of dashes.

The effect is to create a column with entries copied from columns nominated in the two final gaps. At each time interval one or other of these columns is chosen according to the logic defined.

The logic is simply a comparison which yields the result true or false. This result, in turn, decides whether the entry is taken from the column nominated in the fourth or fifth gap respectively.

The comparison is made between corresponding entries in columns on either side of the comparative phrase. This phrase is made complete by the word in the second gap; for example 'is less than'.

Example 1:

=if__m02a__is__more__than__M02b__use__M36c__
otherwise__M36d____

Result	M02a	M02b	M36c	M36d
125	2	1	125	−67
431	2	−1	431	−143
−280	6	6	279	−280
990	−2	−3	990	−20

Notice that because 6 is not more than 6 the logic yields false rather than true. Notice also that −2 is more than −3.

Example 2:

=if__m02a__is__other__than__2__use__ M36c__otherwise__

Result	M02a	Implied	M36c	Implied
125	2	2	125	–
431	2	2	431	–
–	6	2	279	–
–	−2	2	990	–

Notice that −2 is other than 2.

7.5.7 Interest

The top line shows :

=interest at_ _% on_ _balance of_ _with_ _

In the second gap should be entered the initial letter of one of the following words :

debit

credit

In each of the other gaps should be the column number or value given elsewhere in a related compound formula. The correspondence between gaps in the related compound and interest formulae is shown by the following example :

=compound__M06f__with__M26a__at__20__%

=interest at__20__% on__
debit__balance of__M06f__with__M26a__

=interest at__20__% on__
credit__balance of__M06f__with__M26a

where M06f nominates a brought-forward column created by means of the brought-forward formula. This column is transformed by the compound formula as already explained.

The effect of the interest formula is to reveal separately the sums of interest already debited and credited so as to achieve the balances computed by the compound formula. The interest formula is an adjunct to the compound formula and must be used with the same arguments in the gaps.

If the account is known to remain in credit then it is unnecessary to apply the interest formula for debit interest, and vice versa. If the account swings between credit and debit the interest formula has to be used twice as illustrated above.

Maximum

7.5.8

The top line shows :

=maximum_ _ _ _ _ _ _ _ _

requiring from one to nine column numbers (not values) in the gaps. Any gaps may be used.

Results are formed by picking the maximum of the elements in corresponding rows of the nominated columns. Items which are dashes are excluded from the process; not treated as zero.

Example

=maximum_ _M21b__M21c__ _M21c__ _ __

Result	M21b	M21c	M21d
12	12	6	0
0	−100	0	−1
−1	−100	–	1
−1	−3	−2	−1

7.5.9 Minimum

The top line shows :

```
=minimum_  _  _  _  _  _  _  _  _
```

requiring from one to nine column numbers (not values) in the gaps. Any gaps may be used.

Results are formed by picking the minimum of the elements in corresponding rows of the nominated columns. Items which are dashes are excluded from the process; not treated as zero.

Example:

```
=minimum____m13a____m13b____m13c___  _  _  _
```

Result	M13a	M13b	M13c
0	12	0	3
3	12	–	3
−100	−100	0	−1
−3	−3	−2	−1

7.5.10 Multiply

The top line shows :

```
=multiply_  _by_  _  _____________________
```

Results are formed by multiplying corresponding elements in the first nominated column by those in the second.

The third gap – the little one – may be left blank or a percentage sign inserted. A percentage sign signifies that all results are to be divided by 100. Thus in the example below the first result would be 3 rather than 300 and similarly for the remaining results.

Example:

```
=multiply____10__by__M03d_  _____________________
```

Result	Implied	M03d
300	10	30
−60	10	−6
0	10	0
−420	10	−42

The top line shows :

=periodic_ _of_ _between entries in_ _____

This is really four distinct formulae. In the first gap should be entered the initial letter (or two initial letters) of one of the following words :

average

maximum

minimum

total

The second gap is for identifying the column of values on which the chosen formula is to operate.

In the final gap a column number is required. The nominated column is conventionally a marker column. However, it could also be a column of numbers in which case every entry that is not a dash would act as a marker.

The marker column breaks the previously nominated column into subcolumns. Each subcolumn runs from the previous subcolumn down to – and includes – the row with the marker. The word in the first gap defines what formula is to be applied to the values in every subcolumn.

The words average, maximum, minimum, total, denote the same operations as the formulae average, maximum, minimum, total except that the periodic formula acts on successive rows of the same column rather than successive columns across the same row.

Example 1:

=periodic__maximum__of__M11b__between entries in__M17c_____

Result	M11b	M17c
–	30	–
30	–6	FEB
–	0	–
0	–42	MAR

Example 2:

=periodic__total__of__10__between entries in__M17c_____

Result	Implied	M17c
–	10	–
20	10	FEB
–	10	–
20	10	MAR

7.5.12 Present value

Assume the starting date of the moneybook is JAN86. Assume also that in FEB90 a car is to be bought at a probable cost of 20,000. How much money must be invested at 12% p.a. in JAN86 in order to pay for the car in FEB90 ? The answer is 'the present value of that car discounted at 12% p.a.'

The top line shows :

=present value_ _discounted at_ _% per_ _intervals

The column nominated in the first gap contains various sums of money, each associated with a date in the calendar of the moneybook. Each of these sums has a present value on the starting date of the moneybook. These are the present values calculated.

The last two gaps are for specifying the discount rate (illustrated as an investment rate in the introductory example). The first value specifies a percentage; the second its theoretical duration. For example, if the moneybook employs a monthly calendar then a discount rate of 7.5% per annum would be specified as 7.5 and 12 (i.e. 12 time periods per annum).

Example:

Assume the moneybook starting date is JAN86 and cars are to be bought in both FEB90 and APR90.

=present value of__M1e__discounted at__12__% per__12__intervals

Result	Calendar	M01e
–	JAN90	–
12591	FEB90	20,000
–	MAR90	–
12355	APR90	20,000

Rate

The top line shows :

7.5.13

=rate_ _% per_ _intervals

Each entry of the resulting column is a percentage rate of compound interest per time interval. The value is equivalent to the nominated rate over the given number of intervals. For example 1.531 is the percentage rate per month equivalent to 20% per 12 months.

Example:

=rate__M08a__% per__12__intervals

Result	M08a	Implied
1.531	20	12
1.531	20	12
1.531	20	12
1.914	25	12

Realize

The top line shows :

7.5.14

=realize_ _at_ _% after_ _intervals

Column numbers or values may be put in the gaps.

This formula enables a column of figures to be variously proportioned and these proportions assigned to the resulting column with various delays.

Example 1:

=realize__M47d__at__100__% after__2__intervals

Result	M47d	Implied	Implied
–	90	100	2
–	500	100	2
90	40	100	2
500	–	100	2
40	130	100	2

The number of intervals after which realization is to occur may be specified as any value but is interpreted as the nearest whole number (e.g. 0.5 as 1). A negative number would be treated as zero.

A number of intervals expressed as zero implies immediate realization as illustrated in the following example. A dash, on the other hand, signifies that there is to be no realization at all.

Example 2:

=realize__M47d__at__100__% after__M26c__intervals

Result	M47d	Implied	M26c
–	90	100	3
500	500	100	0
40	40	100	0
90	–	100	–
–	130	100	–

The following example shows the result of realizing less than 100% of the affected values.

Example 3:

=realize__M47d__at__20__% after__M48b__intervals

Result	M47d	Implied	M48b
–	90	20	2
–	500	20	1
18+100=118	40	20	2
–	–	20	–
8	130	20	2

A factor greater than 100% may be used.

The following example illustrates disposal values of assets acquired at prices shown in M48a, but written down according to the pattern of percentages in M48b. The numbers of intervals between acquisition and disposal are recorded in M48c. The percentage to be applied is found by counting down the column of percentages from the first entry. The corresponding value in M48c specifies how far to count.

Example 4:

=realize__M48a__at__M48b__% after__M48c__intervals

Result	M48a	M48b	M48c
–	10,000	100	1
9,000	6,000	90	3
–	500	80	–
4,000	4,000	70	0
4,200	800	60	2

Notice that the fourth item is disposed of in the period in which it was acquired.

Round

The top line shows :

7.5.15

=round_ _with_ _to nearest_ _____

Column numbers or values may be put in the gaps. A blank gap signifies a dash; hence an implied column of dashes.

The effect is to create a column of values rounded to a specified accuracy. Two applications of the formula are illustrated below; one for rounding to the nearest unit (e.g. nearest dollar), the other for 'batching'.

Example 1:

Round to nearest unit

=round__M12b__with__ __to nearest__1_____

Result	M12b	Implied	Implied
17	17.49	–	1
18	17.50	–	1
−17	−17.49	–	1
−18	−17.50	–	1

Notice that 17.50 is rounded up rather than down. The effect could be altered by entering −0.005 in the second gap; then the value to be rounded would be 17.495 which would round to 17. The last value would round to −17 instead of −18.

Rounding to unity (or .01 to adjust to the nearest cent or penny) is indicated where there are subtotals, and these are expected to add precisely to a grand total.

Example 2:

Batching

=round__M12c__with__100__to nearest__200_____

Result	M12c	Implied	Implied
200	150	100	200
200	200	100	200
400	240	100	200
400	280	100	200

Column M12c defines some minimal requirement (e.g. of plastic washers). The 200 specifies the size of batch to be dealt with (200 washers to a box). The 100 is a 'margin' to prevent under-ordering. The result then represents an ordering pattern of washers to meet the requirement. Every entry is a multiple of the batch size.

7.5.16 Shift

The top line shows :

=shift_ _by_ _____

This formula is intended for modelling the effect of moving the values in a column forward or backward a whole number of intervals. A column number is put in the first gap and the value of the shift in the second gap.

Example 1:

=shift__M53b__by__ −2_____

Result	M53b	Implied
112	75	−2
27	40	−2
93	112	−2
–	27	−2
–	93	−2

If the value given is not an integer it is treated as the nearest whole number (−3.5 becomes −4, 3.5 becomes 4).

Example 2:

=shift_M27f_by_1.3

Result	M27f	Implied
–	80	1
80	40	1
40	60	1
60	20	1

etc.

Spread

The top line shows :

=spread_ _by_ _% through_ _intervals

Column numbers or values may be put in the gaps. A dash in the final gap does not, however, signify zero; it signifies all remaining rows of the column.

This formula is to model the effect of delayed and partial payments. Instead of receiving the full sum when due, part of it is received when due, another part during the next time interval, and so on. If the product of the percentage and the number of time intervals is less than 100 it signifies that part of the payment is never recovered.

Example 1:

=spread_M07a_by_25_% through_3_intervals

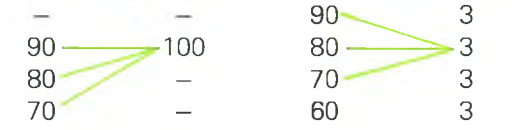
Result	M07a	Implied	Implied
25	100	25	3
25	–	25	3
25	–	25	3
–	–	25	3

Notice that only 3×25% = 75% of the value in column M07a is received; the remainder being lost.

Percentages are applied always from the top of the column of percentages.

Example 2:

=spread__M07b__by__M07c__% through__3__intervals

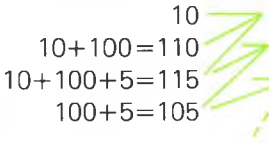


Result	M07b	M07c	Implied
–	–	90	3
90	100	80	3
80	–	70	3
70	–	60	3

The following example is to illustrate accumulation of results :

Example 3:

=spread__M07d__by__10__% through__3__intervals

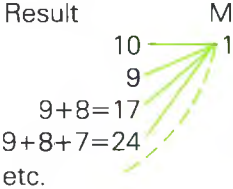


Result	M07d	Implied	Implied
10	100	10	3
10+100=110	1000	10	3
10+100+5=115	50	10	3
100+5=105	–	10	3

The final example is to illustrate the effect of a dash specifying the number of time intervals :

Example 4:

=spread__M07a__by__10__% through__M06f__intervals



Result	M07a	Implied	M06f
10	100	10	1
9	90	10	–
9+8=17	80	10	–
9+8+7=24	70	10	–

etc.

Subtract

7.5.18

The top line shows :

```
=subtract:_  _minus_  _____
```

Each element is formed by subtracting corresponding elements in the nominated (or implied) columns.

Example:

```
=subtract:__M11b__minus__10_____
```

Result	M11b	Implied
20	30	10
−16	−6	10
−10	0	10
−52	−42	10

(The same result could be achieved using Add instead of Subtract, but with −10 instead of 10).

Tax

7.5.19

The top line shows :

```
=tax_  _% of_  _____
```

Column numbers or values may be put in the gaps.

The resulting column represents tax at a specified percentage on the amounts recorded in the nominated column. If any of these amounts is negative the corresponding tax for that amount is shown as a dash. However, this negative amount is then set against subsequent positive amounts if any.

Example:

```
=tax__50__% of__M01f_____
```

Result	Implied	M01f
25	50	50
50	50	100
–	50	−100
150	50	400

7.5.20 Total

The top line shows :

```
=total_  _  _  _  _  _  _  _  _  _
```

requiring column numbers (not values) in the gaps. Any gaps may be used.

Results are formed by summing values in corresponding rows of the nominated columns.

Example:

```
=total__M12a___  ___M12b____M12c___  _  _  ___
```

Result	M12a	M12b	M12c
18	12	6	0
−101	−100	0	−1
−6	−3	−2	−1
0	0	0	0

7.5.21 Value

The top line shows :

```
=value_  ____________________________________
```

If a value is put into the gap the result is a column in which every entry has the given value.

Example 1 :

```
=value__10_____________________________________
```

Result	Implied
10	10
10	10
10	10
10	10

If a column number is put into the gap the resulting column is simply a copy of the nominated column.

Example 2:

```
=value__M11b_____________________________________
```

Result	M11b
30	30
−6	−6
0	0
42	42

Value Expression

The top line shows :

=value _____

where the single gap should be filled with an expression. An example of an expression is :

=value M23a * 5/9 - M23b + 200_____

which means take five-ninths of the first value found in column M23a, subtract the first value found in M23b, then add two hundred - and so on for successive values in the column being formed.

In all other formulae the arrangement is automatically set out on the top line leaving specific gaps to be filled with clearly defined items of data. By contrast, when using the =value formula, the expression is composed entirely by the user of the system. As a result the system is not able to check the sense of the formula to the same degree.

An expression is composed of elements bound together by operators. An element is a column number such as M23a or a number such as 200. An element may also be a function such as sqrt(M23c) which implies a column of numbers of which each is the square root of the corresponding number in M23c.

The operators which bind elements together are:

+ add
- subtract
* multiply
/ divide
^ raise to the power. Thus 3 ^ 2 means three squared (in other words nine).

The ^ may be written as the word 'power' if desired; thus (3**power**2) means (3 ^ 2).

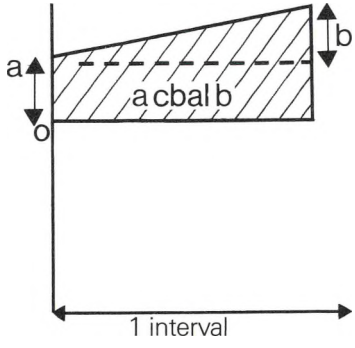
Round round to a multiple of ... Thus (1.234**round**0.01) would yield 1.23; (1.235**round**0.01) would yield 1.24.

max the maximum in a pair. Thus (123**max**250) would yield 250; (-10**max**0) would yield 0. However a dash behaves as though not there at all; (-10max-) would yield -10

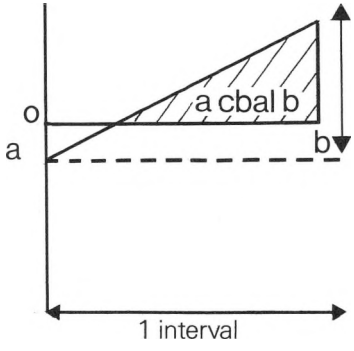
min the minimum in a pair. This operator has a behaviour corresponding to **max**. (To find the **max** or **min** of several elements, use the operator successively: 5**min** 4**min** 3**min** 2 yields 2).

sign the sign of the element on the right is applied to the absolute value of the element on the left. Thus (3**sign**6) yields 3; (-3**sign**6) yields 3; (3**sign**-6) yields -3; (-3**sign**-6) yields -3 (3**sign**0) yields zero; (3**sign**-) yields -

cbal the effective credit balance when the first element represents the opening balance and the second element represents the movement, assumed evenly spread, over the time interval.



Example 1



Example 2

dbal the effective debit balance. As for **cbal**, except that the area measured is the area enclosed under the zero balance line.

(The result is a dash for example I above; it is the area of the unshaded triangle in example 2).

shift a column shifted a whole number of time intervals into the future or past. A number (not an expression) must be given after the operator; a number such as 2.5 would be rounded to 3.

Example: M26c**shift**2 means treat every entry in M26c as though delayed by two time intervals, treating results in the first two intervals as dashes.

Example: (M26c+M26d+100)**shift**-3 means that all values made by adding corresponding entries in M26c and M26d plus 100 are assumed to be shifted back three intervals, the first three entries in M26c and M26d not being involved at all.

The functions available for creating an element from another element are:

abs absolute value. Thus **abs**(2) and **abs**(-2) both yield 2

ln natural logarithm. Thus **ln**(2.718) the log of e, yields 1. The argument of the function should not, of course, be zero or negative.

exp exponential (natural antilog). Thus **exp**(1) yields 2.718 or e

sqrt square root. Thus **sqrt**(4) yields 2. The argument should not, of course, be negative.

prior prior value. 'Prior value' means the value of the expression just computed for the previous time interval. Thus if **prior**(10) were the only element in an expression the result would be a column with the same entry in each time interval. The first entry, by nature of its position, has no 'prior value'. That is the reason for the argument (the 10 in the example above). The argument of **prior** supplies the 'prior value' for the first element.

Example: =value prior(10)+1
generates 11 in the first time interval
12 in the next
13 in the next, and so on.

pos positive value; yielding the value of its argument when the argument is greater than zero, otherwise a dash. Thus **pos**(6) yields 6; **pos**(-6) and **pos**(0) both yield a dash.

neg negative value; the function corresponding to **pos**. Thus **neg**(-6) yields -6; **neg**(6) and **neg**(0) both yield a dash.

a minus sign in front of an element implies that the value used to form the expression is to be reversed in sign. (As an operator the minus sign comes **between** elements but it may also be used as a prefix, like the name of the function, in expressions such as :

-M26a*1.5).

There are also two special constructions permitted in expressions. The first is a percentage sign written after the element it refers to :

% treat the preceding element as a percentage. Thus 6% means 0.06 and could be expressed equally well as 6/100

if The second construction is a logical expression which takes the value of its first or last element according to the result of the comparison described. Thus :

1.5 if 20>30 else 2.5

would yield 2.5 (twenty is not greater than thirty) whereas :

1.5 if 20<30 else 2.5
1.5 if 20 #30 else 2.5

would both yield 1.5 because twenty is less than thirty, likewise twenty is not equal to thirty.

Three comparisons allowed are :

> more than
< less than
other than (not equal)

To achieve a test for equality simply reverse the construction for inequality. Compare the previous example :

2.5 if 20 #30 else 1.5

The above examples are to explain principles and would not be used in practice; everyone knows 20 is less than 30. A more realistic construction would be :

M01a if M26a<M26b else M01a*115%

Operators in expressions have precedence just as they do in conventional arithmetic. 2+3*5 to most people means 2+(3*5) rather than (2+3)*5 because multiplication has greater precedence than addition. However, brackets may be used to override the order of precedence built into the program; the above expression may be typed as 2+3*5 or as 2+(3*5) or as ((2+3)*5) to achieve the desired interpretation.

Where no brackets are specified the program effectively supplies them, adopting the precedence defined by the list below, reading from top to bottom. In this list are groups of functions and operators of equal precedence: for instance * and /. In cases of equal precedence the program supplies conceptual brackets scanning the expression from left to right. Thus 2*4/3 would be evaluated as ((2*4)/3) rather than 2*(4/3)).

Here is the order in which the program supplies a conceptual pair of brackets :

1st	**shift**
2nd	elements followed by percentage signs; 2*3%+4 becomes 2*(3%)+4

3rd	function and its argument; 2*sqrt6/8 becomes 2*(sqrt6)/8
4th	power; 2*3^2/3 becomes 2*(3^2)/3
5th	round, max, min, sign, cbal, dbal; 2min3*4max5 becomes (2min3)*(4max5)
6th	*, /
7th	+, -
8th	<, >, #
9th	if
10th	else

The following example illustrates the automatic supply of conceptual brackets to an expression that has none :

=value 2*sqrt9*16%*4max5*2
2*sqrt9*(16%)*4max5*2
2*(sqrt9)*(16%)*4max5*2
2*(sqrt9)*(16%)*(4max5)*2
etc. down to
((((2*(sqrt9))*(16%))*(4max5))*2)

In the example in 7.5.2 the formula says the results are to be formed by averaging corresponding items from modelling columns M11c, M02a, M02b. These columns could be data columns; on the other hand they could themselves be calculated columns. These, in turn, could refer to yet other calculated columns.

So an impossible calculation could be specified without the program being able to detect the mistake. For example the formula might nominate a column which, when results are to be calculated, happens to be inactive. Or one of the values in a column of divisors could turn out to be zero. In such situations the modelling page may still be turned over, but results impossible to calculate would then be shown as an asterisk. In some cases an explanatory message is displayed.

When a modelling page is turned over, formulae in its calculated columns are evaluated. But if the page is turned back and forth these calculations are not performed over and over again; the results previously calculated are retrieved from memory. A page is recalculated only if there has been a change to any of the columns upon which the results side depends. This strategy makes for speed. When a change is made to any model only the affected columns of the model are recalculated.

Calculations are performed and stored to full precision. However, when a page is turned over the results in each calculated column are displayed to the nearest multiple of the display factor for that column. This may be verified by changing such a display factor to a smaller one and noting the effect on results.

8

Moneysearch

Searching

A moneybook may have many modelling pages in use and up to six times as many columns. It is impossible to remember the titles and column numbers of all modelling columns and impractical to record them with pencil on paper as the model is constructed. There is, however, a facility for displaying (on the second line of the screen) the corresponding title when any column number is typed at the keyboard. The facility may be used for displaying the corresponding column number when the column title – or any remembered fragment of that title – is typed. The logical dependence of one column on another may also be explored.

This facility, called moneysearch, is described in this chapter.

The second line of the screen is called the search line and usually appears blank.

The Search Line

No matter what is currently on the screen – a selection of services, a service screen, a selection of pages, a page of the moneybook – typing an opening quote takes the spotlight straight to the top of the screen which then appears as follows without disturbing the rest of the screen :

```
Search : "
```

If this were to happen accidentally the spotlight could easily be moved back to where it came from. The original content of the top line may be restored, and the spotlight sent back to its former position, by deleting the opening quote.

The opening (and closing) quote is on the key denoted " on the reference card.

The opening quote introduces a searching key as explained later. This searching key may be edited in the top line as described in 3.5. The search is initiated by typing a closing quote. When a closing quote is typed the program carries out the search specified. The information sought is then displayed in the search line and the previous content of the top line is restored. The searching key (what was typed between the quotes) is shown underlined.

Possible kinds of search are described individually below.

8.2 Finding a Column Number

To find a column number when the title, or just part of the title is known, type the remembered part in the search line. For example:

Search : "Value added tax"

The response of the search line might be :

3 matches No. 1 **M22e** "Value added tax due"

showing that there are, in the moneybook, three column titles incorporating the searching key (which is shown underlined). M22e is the first match – the one with the lowest column number – and M22e is shown bright in the search line.

To display the second match, press **next match**. The response might be :

3 Matches No. 2 **M22f** "Value added tax paid"

Pressing **next match** again might produce :

3 Matches No. 3 **M27d** "Value added tax"

The list of matches is circular, so the display may be scanned again by continuing to press **next match**. Or the list could be scanned the other way round by pressing **previous match**. There is always a blank entry between the last and first entries so the key would have to be pressed twice at this point.

In this example the third match is precise; the entire title underlined. Were this not so the circular list would be extended to include 'pending' matches as explained in 8.5.

The column number shows bright. It may be entered in the top line (without retyping) by pressing **insert match** as explained in 8.5.

8.3 Finding a Column Title

To find a title when the column number is known type the column number. For example :

Search : " **M27d** "

The response of the search line might be :

1 matches No. 1 M27d "Value added tax"

with the title of the nominated column – shown bright and underlined – successfully found. If column M27d were not in use no title would appear between the quotes.

Every column number in the moneybook is unique. So when the searching key is a column number (rather than a title) the search line declares precisely one match.

The form of the search line illustrated above is the same as that shown in 8.2 except for the underlining. The searching key is the part that is underlined; in the above case the searching key is the column number.

The column number shows bright. It may be entered in the top line (without retyping) by pressing **insert match** as explained in 8.5.

Logical Dependence

8.4

A calculated column has a formula on the working side of the page; this formula refers to other column numbers. So a calculated column is logically dependent on other columns.

Before a column is altered in content, or is deactivated or exterminated, it is possible to check whether other columns are logically dependent on it.

The column number or its title is first typed as a searching key as described in 8.2 or 8.3. The search line should now display both the column number and full title. For example :

2 matches : No. 2 **M06a** "Managers' Salaries"

Now press **next use.** The search line would then display one of the formulae in which M06a is used. Pressing **next use** again would make the search line display the next formula in which M06a is used, and so on. The formulae appear in the order of the column numbers that are on the left of the equals sign. The following is an example of the changing search line as **next use** is repeatedly pressed :

M07b = add **M06a** to M06b

M23f = multiply M23e by **M06a**

M06a = add M52b to M01a

This list shows every column logically dependent on M06a; the number M06a being on the right of the equals sign. But the final item in the list is the *definition* of the column; it has the column number on the left. The example above shows that M06a is immediately dependent on two other columns. Many lists end with the column number (on the left) being defined as 'data'.

The list is circular, the circular path running first through the uses of M06a (if any), then through the definition of M06a itself, then back to the search line displayed before **next use** was originally pressed. This list may be scanned the other way round by pressing **previous use**.

It follows that pressing **previous use** rather than **next use** in the first instance would cause the search line to display the column definition straight away. The quickest way to leave the circular list is to press the **next match** key. **previous match** key. The latter action, in this example, might make the search line display :

2 matches : No. 1 **M05f** "Salaries & Overheads"

Throughout the operations described above, the column number which is the subject of the search appears bright. It may be entered in the top line (without retyping) by pressing **insert match** as explained in 8.5.

8.5 Modelling by Column Title

The search line is most useful when modelling. For example, a column entitled 'Total Expenditure' is to be the sum of 'Salaries' and 'Overheads'. The formula is simple, but what were the column numbers given to 'Salaries' and 'Overheads'? The easiest way to find out – without leaving the modelling page – is to search. The first search might yield :

6 matches : No. 1 **M22e** "Salaries"

whilst the top line shows a formula with vacant gaps:

=add_ _to_ _____

With the cursor in the first gap, and M22e in the search line, press **insert match**

The effect would be :

=add__ M22e __to__ _____

The column number of 'Overheads' may be put into the second gap in precisely the same way.

The principle illustrated above is *modelling by column title*. It is not necessary to remember column numbers. Nor is it necessary to remember titles precisely; a list of partial matches may be scanned rapidly. Nor is it necessary to type the column numbers.

In general, during the searching operation described in this chapter, the column number which is the subject of the search shows bright. To copy this column into the top line press the **insert match** key. Pressing **insert match** causes a copy of the column number showing bright in the search line to appear in the top line – at the current position of the cursor.

Pending Columns

8.6

In the example in 8.2 there is a precise match between the search key and the column title. Sometimes there is no precise match; there are only partial matches or no matches at all.

In such cases the list of partial matches (if any) is automatically extended. The extension comprises column numbers of all columns that do not yet have titles. These are arranged in ascending order of column number.

The extended list remains circular so it is possible to keep pressing **next match** to get back to the partial matches at the beginning. But the extended list is usually long so it is quicker to use **previous match** than go all the way round the list. The purpose of adding vacant columns to the list of matches is to enable them to be reserved for future use – by allocating titles – without having to turn up a modelling page with vacant columns.

Suppose the following title were typed as a searching key :

Search : "Income tax monthly"

Unless this title were already in use the list of partial matches (if any) would be extended to include the vacant columns as

already explained. After scanning the partial matches the first item in the pending list would appear. For example :

Pending : M36a "Income tax monthly"

This says that M36a is a vacant column which may be reserved and given the title shown. To do so press **insert match.** (Or press **next match** until the desired column number comes up, then press **insert match.**)

The rest is automatic. Column M36a is now entitled "Income tax monthly" as maybe verified by turning up page M36. Furthermore M36a disappears from the pending list because it is now a precise match.

It is impossible to put into a calculated column any formula that refers to columns which do not yet exist. For example the formula **=add M41a to M42a** would not be accepted unless M41a and M42a already existed. But these column numbers could be reserved – hence be acceptable in the formula – in the manner described above. This is the usual reason for reserving columns.

Pressing **insert match** causes a column to be reserved, and a title allocated, as already described. It also causes the bright column number in the search line to be copied into the top line – at the current location of the cursor – as explained in 8.5. The purpose of reserving columns is explained in the paragraph above. A formula would be in the top line with the gaps vacant. So as each column is reserved its column number is automatically copied into a gap in the top line without retyping.

8.7 Criteria for a Match

The sequence of characters typed between quotation marks is called the searching key. Matches with column titles are made by the criteria explained below. For this explanation assume a searching key as follows :

"and over"

The distinction between a capital letter and a small one is ignored. So the following titles would be matched :

and over

And OVER

Spaces in the key break it into fragments; in this case 'and' followed by 'over'. The first fragment is shunted along the title to find a match, spaces in the title being significant. Because spaces are significant there would be no match with :

Ian Dover Ltd

If a match is found on the first fragment the second fragment is placed to the right of it and shunted along as before to find a further match. Thus the following titles would be matched :

Hand over fee

Handover fee

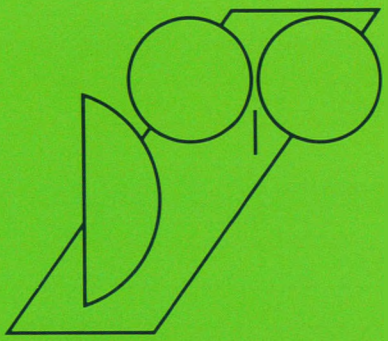
H and L Co. (Rover) Ltd.

The fragments are placed one after the other in this manner but never in reverse order. There would be no match with :

Over and out

This method finds the matches a person would make 'naturally'.

A special case is a null searching key – a closing quote straight after the opening quote – made by pressing " twice. This null key matches every column title.



9

Presentation Page

Presentation Page

A moneybook may have presentation pages. These pages contain figures and text items from modelling pages but in an arrangement composed by the user of the system. Other kinds of page have standard composition. 9

A composition is specified on the working side of the presentation page. The presentation page should have a title (for reference from the contents page) and a base date. The way to include these items is explained in 5.6. The remainder of the presentation page is initially blank – a rectangular array of empty cells. This chapter explains how to fill cells on the working side so as to compose the presentation desired on the results side.

The working side of the presentation page allows control of the following :

- different widths of column
- ruling of horizontal and vertical lines
- annotation
- left, right or central justification
- abstraction of any information (dates, titles, units, entries, totals, differences) from modelling columns.

The effect of any operation can be seen immediately by turning the page to its results side.

Structure of Page and Cells

The presentation page is initially a block of empty cells, 28 across, 71 down, all initially 11 character positions wide. 9.1

Viewing the page

The working side of an empty presentation page is shown in fig. 9.1 where only the top left hand corner is seen. This area contains six and a half columns and seventeen rows. But if the spotlight is moved below row seventeen the page scrolls upwards. Similarly, if the spotlight is moved towards column seven the page scrolls leftwards. The screen is thus a window onto the presentation page. The window frame may be moved up, down, left, right, so as to show any part of the page in the window. 9.1.1

9.1.2 Turning the page

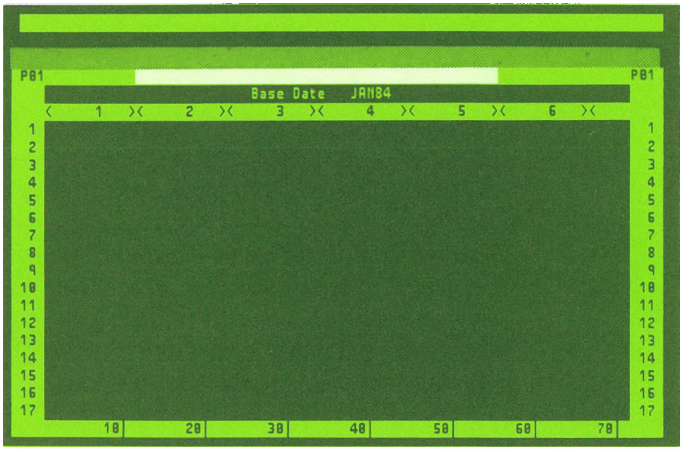
As with other pages of the moneybook (except contents and key pages) the presentation page may be turned over, by pressing **f1**, to see the effect of the composition specified on the working side. An elegant layout may be achieved by studying the results side critically, making small improvements to the composition on the working side, turning the page to see the effect, and so on. A change is easy to make.

9.1.3 The empty cell

Each cell is a sequence of character positions which can be made as narrow or as wide as required. The means of doing so are explained later. The final character position – called the terminator – is special. It is the one through which a vertical line may be ruled. (It also has an emergency use if numbers turn out to be much bigger than expected. This is explained in 9.8.)

Cells may be joined to each other sideways or vertically so as to create rectangular blocks of text of any desired size. The means of doing this are described later.

FIG. 9.1 WORKING SIDE OF BLANK PRESENTATION PAGE



Method of Filling Cells

9.2

The cells on the working side of a presentation page are filled in the same way as calculated columns on a modelling page. Two code letters are typed at the keyboard; the program responds by completing the remainder of the top line leaving gaps to be filled from the keyboard.

For a calculated column the top line contains a *formula* for the required calculation. On a presentation page the equivalent of the formula is called the *compositor*; it is a formula for composition.

9

Selecting a compositor

9.2.1

A compositor is selected by typing the initial letters of its keyword in precisely the same way as a formula (or generator) is selected. The compositor is then satisfied by filling the gaps and pressing **return** – just as for a formula. And as with a formula, the cursor is moved from gap to gap by pressing **left** and **right**

Keeping the top line

9.2.2

There is a facility unique to compositors; it is the small gap at the end of the line.

When dealing with calculated columns the formula disappears from the top line as soon as the spotlight is taken off the current column. If the spotlight is moved to another calculated column the formula in the newly-spotlit column appears in the top line. Precisely the same happens with compositors as long as the small gap at the end of the top line is left blank.

However, the keep facility may be used :

Final gap: Leave blank if the top line is to change on moving the spotlight to another cell. Enter letter **k** (the gap responds by showing the word 'keep') if the top line is to be *kept* when the spotlight is moved to another cell.

This facility is provided because in tabular layouts there are rows and columns of similar entries; for example a row of entries right across the page, each derived from the same modelling column. This demands a row of identical compositors. It would be tedious to select the same compositor, and fill its gaps, every time the spotlight was moved to the next cell. It is much less trouble to keep the top line. Then all that is needed is to press **return** every time the spotlight is moved to the next position across the row.

An example of a top line in which this facility is used is :

item from column__M23d__at date_ _____keep_

which, if put into successive cells across the presentation page, would signify that successive elements of modelling column M23d are to be arranged across the page.

9.2.3 Erasure

To put a compositor into a spotlit cell the first two letters of the compositor are typed, items are put into the gaps, then **return** is pressed. The contents of the top line then appear in the spotlit cell in abbreviated or symbolic form as explained later.

From time to time it becomes necessary to erase the contents of such cells. This is done by using the 'eraser' or 'blank compositor'.

Erasure: Type two spaces instead of two letters at the beginning of the top line. Direct the spotlight to the cell whose contents are to be erased. Press **return**.

There is a byproduct of the 'eraser'. Holding down the **help** key whilst the left of the top line is blank causes the screen to display a list of available compositors.

9.3 Geometry of Page

Any column may be made wider or narrower. Lines may be ruled horizontally through adjacent cells; vertically through terminators of cells stacked one above the other. Any cell may be joined to the cell on its left, or to the cell above, so as to

make blocks of text in different sizes.

Width of columns

With the spotlight on a cell type the letters **wi**. The top line becomes : 9.3.1.

width_ _characters across cell_____ _

requiring an integer in the first gap. For example, to make a column of cells twenty characters wide type 20 in the first gap.

After pressing return the response is immediate. The spotlit column of cells changes in width to the specified number of character positions. If the page is turned over it will be seen that both sides are adjusted.

The specified width includes the terminator so in the above example there are 19 characters for storing the data (text or value). In a column of numbers the width should not, without forethought, be set to less than eleven. There is more about this in 9.8. However, a column of cells may be reduced to a width of one character if its only purpose is to provide terminator cells for a vertical line. This use is explained below.

The width of a column may be changed either when the column is empty or when it is full of data.

Ruling lines

With the spotlight on a cell type the letters **li**. The top line becomes : 9.3.2

line_ _____ _

requiring one of the following letters in the first gap:

h to signify a horizontal line through the cell

v to signify a vertical line through the terminator

The use of an empty gap is explained below.

After pressing return the response is immediate. If letter **h** is entered the line is drawn horizontally through the middle of the cell. If letter **v** is entered the line is drawn vertically through the terminator.

A horizontal line precludes any other use of the cell through which it is drawn but a vertical line is drawn through the terminator without disturbing any item already in that cell. (The undisturbed item could be a horizontal line; the cell would then contain crossing lines.)

A line, horizontal or vertical, may be rubbed out by leaving the gap in the top line blank, then entering the blank by pressing return. Crossing lines would both be rubbed out by this procedure.

It is seldom necessary to specify crossing lines in the same cell. All corners, and most crossings, are resolved automatically and neatly. To appreciate this it is only necessary to specify some lines forming a rectangular box (more adventurously a box containing a grid of crossing lines) and see the result on the screen. Experiment is recommended.

9.3.3 Joining cells

With the spotlight on a cell type the letters jo. The top line becomes :

requiring in the first gap one of the following letters :

u to signify upwards

l to signify leftwards.

After pressing return the spotlit cell contains the legend JoU or JoL. It says that this cell is now part of the one above or to its left respectively. It is meaningless to put U into cells in the top row or L into cells down the left-hand side.

Up to fifty cells may be connected in this manner so it is possible to make joined-up blocks of any practical size. The shape should always be rectangular.

Joined-up blocks are for displaying texts, not numbers. The text should be put in the top left cell of the block using any of the following compositors all of which are described in this chapter :

■ Text

■ Title

■ Units

■ Item (when from a marker column)

The text spreads out to occupy the joined-up block inside which it may be justified or centred as described later. The effect may be seen by turning the page over. Any cells containing the **Jo** legend, but not being properly joined to a cell containing text, would appear with an asterisk on the results side.

If a vertical line is ruled through a joined-up block it acts as a barrier to the text in that block. The text would appear to the left of the line and an asterisk to the right.

Date and Implied Dates

9.4

The empty presentation page has a title (for reference from the contents page) and a base date. Various other dates may be put into cells on the presentation page; these dates being defined absolutely or relatively. When given relatively they are measured relative to the *base date*.

Relative dates

9.4.1

An absolute date must be given in the same form as those in the moneybook. Thus if the calendar in the moneybook runs JAN85, FEB85, . . . it would be a mistake to enter a quarterly date such as 1st85 on the presentation page.

A relative date is typed as a plus or minus sign followed by an integer. For example +0, +2, +13. A relative date signifies a number of time periods (appropriate to the calendar of the moneybook) added to the base date. So, for example, if the base date is JAN85 then +0 signifies JAN85, +2 signifies MAR85, +13 signifies FEB86. Relative dates may also be negative, so −2 would signify NOV84.

Date into a cell

9.4.2

A date is put into any cell as follows. With the spotlight on the cell to receive the date type the letters **da**. The top line becomes :

date_

requiring an absolute or relative date in the first gap. For example +2.

After pressing **return** the spotlit cell would retain the date in the form Da +2 (in general it would show the letters Da followed by the date in the form in which it was typed).

On the results side of the page any relative dates are shown resolved. Thus if the page were turned over the Da +2 would appear as MAR85 (assuming a base date of JAN85 as before).

9.4.3 Other compositors

Other compositors include the phrase **at date** in the line followed by a gap. This gap may be filled with a date in the manner already described for the Date compositor.

These compositors are: Difference, Item, Total.

After using any of these compositors the spotlit cell would contain the first two letters of the compositor (Di, It or To) along with the rest of the information from gaps in the top line. This information would include a date if the date cell were not left blank. For example :

It M23a 2

But the gap for the date may always be left blank; the above example would then become :

It M23a

and the date for this cell (every cell with Di, It or To is associated with a date) would then be inferred from some other cell in the manner described below.

9.5 Implied Dates and Columns

In general, where compositors have a gap for a date it is permissible to leave the gap blank as described above. Likewise where compositors have a gap for a column number it is permissible to leave the gap blank. Leaving a gap blank *implies* a date or column number by default. Implied dates and columns are defined below.

9.5.1 Implied dates

Every cell on the presentation page which contains one of the following compositors: Date, Difference, Item, Total, is

associated with a date – whether a date has been put in the cell or not. If no dates are given in the manner described in 9.4.2 or 9.4.3 then the date of every such cell is the base date by default. But once a date is put into a cell other cells below it (and to its right) receive the same date by implication. Every cell in this zone of influence – defined fully below – infers the same implied date.

The location of the zone of influence depends upon whether other dates are put into cells in the same row. There are three possibilities; the date may be :

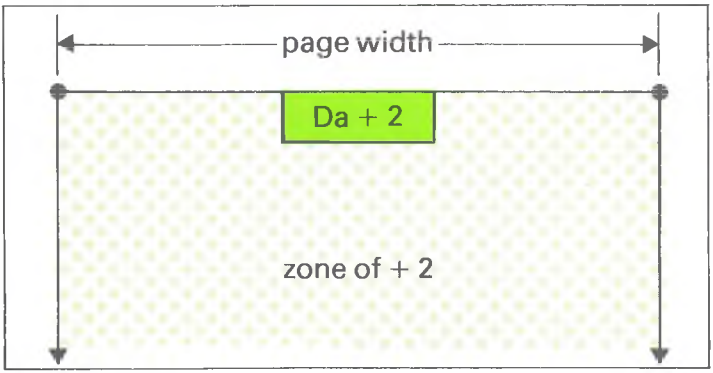
(a) the only date in the row

(b) the first of several dates in the row

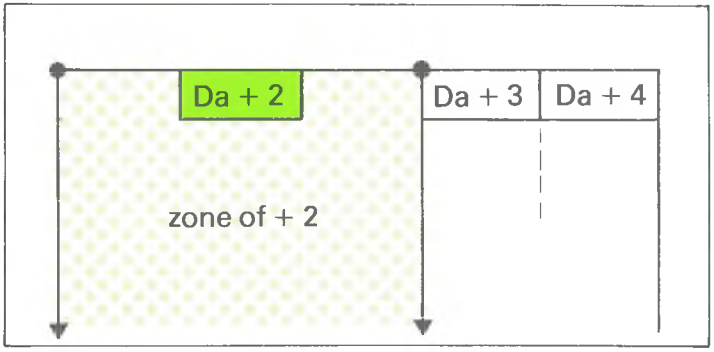
(c) the second, or subsequent, date in the row.

The zones of influence are depicted in fig. 9.2 for these three cases. If these diagrams are immediately comprehensible there is no need to read the explanation which follows.

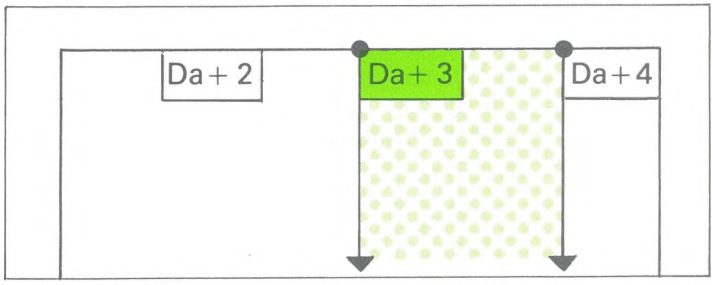
FIG. 9.2 ZONES OF INFLUENCE



(a) Only one date in the row



(b) First of several dates



(c) Second or subsequent date

Consider first the width of the zone of influence. In case (a) the border extends right across the row. In case (b) the border runs from the beginning of the row to a point just before the next dated cell. In case (c) the border includes the current cell and runs to a point just before the next dated cell – or to the end of the row if there are no more dated cells.

In every case the vertical border includes the current row and runs downwards either to the bottom of the page or as far as the next row of dated cells.

9.5.2 Implied columns

Every cell on the page which contains one of the following compositors: Difference, Item, Scale, Title, Total, Unit, is associated with a modelling column – whether a column number has been put in the cell or not. For example, a cell might contain either of the following :

It M23a +2

It +2

where the column number in the second example is implied by default.

Every cell containing a specific column number has a zone of influence, all cells within that zone inferring the same column number.

The zone of influence of a column is determined by the same principles as the zone of influence of a date. The principles are illustrated in fig. 9.2. There is, however, one difference in principle; whereas the omission of crucial dates implies the

base date there is no 'base column' to play a corresponding part. Omission of an essential column number is signalled on the results side of the presentation page by an asterisk. There would be an asterisk in cells unable to infer – from other cells – an implied column number by looking upwards and leftwards.

Purpose of zones of influence

9.5.3

Suppose dates are to be arrayed across the top of a presentation page and titles down the left-hand side. Column titles are specified by the Title compositor which requires a column to be nominated. So the two kinds of zone intersect as illustrated in fig. 9.3

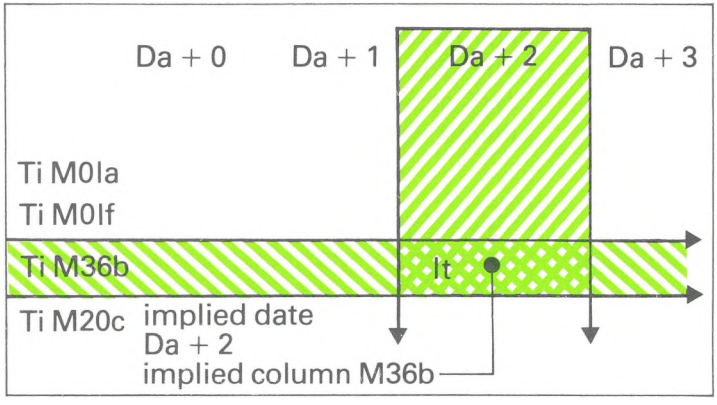
In each area where date and column zones intersect each other both a date and a column number is implied. So any compositor used in that area may have its date gap (if any) left blank and its column number gap (if any) left blank.

Referring to fig. 9.3 an item from a modelling column may be placed in any position using the Item compositor with the two main gaps blank. Used with K in the final gap the whole page would be completed rapidly by directing the spotlight to each cell in turn and pressing **return**.

However, there is nothing to prevent a date or column number being specified in which case it would override the implied value and set up its own zone of influence.

Some thought – and experience – should convince the reader that zones of influence, as described, cover the presentation page in the most 'natural' way possible.

FIG. 9.3
IMPLIED DATES & COLUMNS



9.6 Handling Text

There are four sources of text for cells on the presentation page :

- annotation from the keyboard
- titles of modelling columns
- units (e.g. Dollars) from modelling columns
- texts from marker columns.

9.6.1 Size and Shape

In every case the text is limited in length to the usual 51 characters including spaces. This imposes no limitation on annotation from the keyboard because any block of text may be treated as several smaller blocks on top of (or next to) one another, up to 51 characters to each.

Any text may be left justified, right justified, or centralized. This is achieved using the Justify compositor as explained later.

The text may be too long for display in the spotlit cell. The end of the text would then be invisible but would remain in existence. Suppose, for example, the word LONGER were put into a cell only five characters wide. The cell would then appear to display the word LONG. (This is only four characters; the terminator position is not used.) But if the cell were subsequently widened to seven character positions the word LONGER would be seen in full.

A text sent to a tall narrow group of cells is automatically folded to fit – in the same manner as titles of modelling columns. Folds are made at existing spaces; also at existing hyphens if any. Hyphens are inserted by the program only as a last resort. The folding techniques are ingenious and too subtle for explanation here; the reader is urged to experiment with tall narrow cells to see what happens.

9.6.2 Text for annotation

This compositor is for transferring annotation from the keyboard straight to the presentation page. With the spotlight on the cell to receive the text type the letters **te**. The top line becomes :

requiring any text that would fit the first gap. On pressing **return** the text typed in the gap is transferred to the spotlit cell.

Title from a column

9.6.3

With the spotlight on the cell to receive the text type the letters **ti**. The top line becomes :

requiring the number of a modelling column (for example M23f) in the first gap. The gap may be left blank if the column number is to be inferred from a zone of influence.

On pressing **return** a copy of the title of the specified modelling column is transferred to the spotlit cell.

Units

9.6.4

Recall that in every modelling column there is a cell between the title and the body of the column. This cell is for a short legend to describe the units in which numbers in the column are expressed. For example, Dollars.

With the spotlight on the cell to receive a text type the letters **un**. The top line becomes :

requiring the number of a modelling column (for example M23f) in the first gap. The gap may be left blank if a column number is to be inferred from a zone of influence.

On pressing **return** a copy of the units legend of the specified modelling column is transferred to the spotlit cell.

A legend in the units cell of a modelling column is not obligatory so the effect of this compositor might be to transfer a blank legend.

Item from marker column

9.6.5

A modelling column may contain numerical data, a formula or markers. Markers are texts, each up to 51 characters long, stored as entries in a marker column. Any marker may be copied to a cell on the presentation page as described below.

With the spotlight on the cell to receive the text type the letters **it**. The top line becomes :

item from column_ _at date_ _____ __

requiring the following entries in the first two gaps:

- a column number (e.g. M26a)

- a date (e.g. JUN86 or 6)

These uniquely define a marker by column and row respectively.

Either or both gaps may be left blank in which case the implied column or implied date is inferred.

On pressing **return** a copy of the specified marker is copied to the spotlit cell.

The Item compositor described above is described again later in the context of numerical entries.

9.6.6 Justification

The contents of a cell may be justified to the left, to the right, or centralized. (This applies to all types of entry but there should be no need to justify numerical results.)

With the spotlight on a cell containing text type the letters ju. The top line becomes :

justify_ _____ __

requiring a letter in the first gap :

l for left

r for right

c for centre.

On pressing **return** the spotlit text is justified left or right, or centred, according to the letter in the gap. Any wide spaces in the text are first reduced to a single space. Then, if the text has to be folded, extra spaces are introduced where necessary to fill out the rows. The reader is urged to experiment by changing from l to r to c and watch the different results.

The first gap may be left blank. A blank signifies no justification.

If a text already justified were to be 'unjustified' in this way any extra spaces removed during the earlier process of justification would reappear.

When several cells are joined (using Join) the Justify compositor should be applied only to the top left-hand cell; the one that stores the text. To see the full result of justification the page has to be turned to its results side.

The Justify compositor has no effect on an empty cell.

Numerical Entries

9.7

There are three ways of locating entries in a modelling column for display on the presentation page:

- as a single entry using the Item compositor
- as the total of a given number of consecutive entries using the Total compositor
- as the difference between two entries in a modelling column using the Difference compositor.

The means of transferring entries, subtotals and differences from modelling columns to the presentation page are described below.

Numbers may have to be scaled to fit the cells provided for them. The provision of a cell for a scaling legend (the word THOUSANDS or MILLIONS) is discussed in 9.8.

A single entry

9.7.1

With the spotlight on the cell to receive an entry from a modelling column type the letters **it**. The top line becomes :

item from column_ _at date_ _____ _

requiring the following items in the first two gaps:

- a column number (e.g. M16a)
- a date (e.g. MAY86 or +2)

These uniquely define an entry by column and row respectively.

Either or both gaps may be left blank in which case the implied column or date is inferred.

On pressing **return** the nominated entry is copied to the presentation page. A record of the entry appears in the spotlit cell on the working side. For example:

```
lt M15a
```

But on the results side the entry itself is displayed.

When one entry is copied from a modelling column to a presentation page it is usual for several others to be copied as well. This calls for the use of letter K in the final gap :

```
item from column_   _at date_   _____keep__
```

Then it is only necessary to move the spotlight from cell to cell, entering implied column and date at each cell by pressing **return**. An illustration of zones of influence is shown in fig. 9.3.

9.7.2 Total

A subtotal may be computed from a nominated modelling column and transferred to the spotlit cell on the presentation page. This subtotal includes a specified number of values taken down to a specified date.

With the spotlight on a cell to receive the subtotal type the letters **to**. The top line becomes :

```
total of column_   _at date_   _over_   _intervals____ _
```

requiring the following entries in the first three gaps:

- a column number (e.g. M20f)
- a date (e.g. JUL87) to give a 'dated entry'
- a whole number of entries (e.g. 4) such that the last is the 'dated entry'. All these entries are added to form the total required.

Fig. 9.4 (a) illustrates some cells of a modelling column from which a total is to be derived. This illustration uses the example data above.

Either or both of the first two gaps may be left blank in which case the implied column or date is inferred.

Should scaling be necessary a subtotal is treated the same way as each of the elements summed. Scaling is explained in 9.8.

Difference 9.7.3

A difference may be computed between two values in a nominated modelling column and transferred to the spotlit cell on the presentation page. The date of one entry is specified; also the number of time intervals by which to locate the previous value to be subtracted. The method is depicted in fig. 9.8 (b).

With the spotlight on a cell to receive the difference type the letters **di**. The top line becomes:

difference in column_ _at date_ _over_ _intervals_ _

requiring the following items in the first three gaps:

- a column number (e.g. M20f)
- a date (e.g. JUL87) to give a 'dated entry'
- a whole number of entries (e.g. 4) such that the last is the 'dated entry'. The first of these entries is then subtracted from the 'dated entry' so as to compute the required difference.

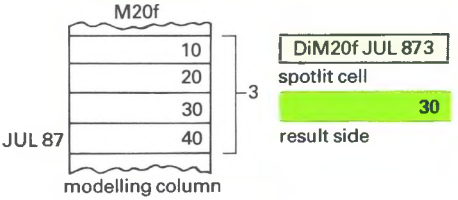
The illustration in fig. 9.4 (b) employs the example data above. (Notice that no changes are made to the modelling column itself.)

Either or both of the first two gaps may be left blank in which case the implied column or date is inferred.

FIG. 9.4 TOTALS AND DIFFERENCES
total of column__ M20f__at date__JUL87__
over__ 4__intervals__

(a) Total compositor

difference in column__ M20f__at date__JUL87__
over__3__intervals__



(b) Difference compositor

9.8 Automatic Scaling

When a modelling column is displayed all its entries are displayed in the same form. When there is a decimal point, for example, it does not wander. The form of display depends on two things :

- the display factor declared at the top of the column (e.g. .01)
- the magnitude of the largest number to be displayed.

9.8.1 Mechanics of scaling

If the magnitude of the largest number permits, numbers in the modelling column are displayed to the same number of decimal places as the display factor and as a precise multiple of it.

Example 1:

Display factor .01
Largest value to be displayed 12345.6789

The number is first rounded to seven significant figures: 12345.6800

To fit the column width of ten character positions only seven digits can be used: 12345.68

The resulting number can be displayed in the preferred form: 12,345.68; all other numbers are displayed in like form.

On presentation pages the rounding to seven significant figures still applies.
When the preferred form is not possible, decimal places are sacrificed.

Example 2:

Display factor .01
Largest value to be displayed 1234567.89

Rounding gives:	1234568.00
Digits to fit column:	1234568
Form of display:	1,234,568

If sacrifice of the decimal fraction is not enough the numbers are automatically scaled by a thousand or a million.

Example 3:

Display factor .01
Largest value to be displayed 12345678.9

Rounding gives:	12345680.0
Digits to fit column:	1234568 × 10
Adjust scaling:	12345.68 × 1000
Form of display:	12,345.68

but with the word THOUSANDS in a special cell above the column of numbers.

By the same procedure the number 12345678900 would cause the displayed form to be 12,345.68 but with the word MILLIONS in the scaling cell.

A similar procedure is applied to numbers on the presentation page but there are important differences to do with 'groups'.

9.8.2 Groups

On a modelling page there may be two columns, each with the same display factor and the same units legend. For example :

But the similarity is not enough to ensure that numbers in both columns would be displayed the same way. If, for example, the biggest number for display in the profit column were 7,654,321, and in the loss column 43.21, the displays of these columns would turn out differently.

On the presentation page, however, all entries from the same *group* of columns – not just from the same column – would be displayed the same way. In the above example both columns would be members of the same group.

Columns belong to the same group if they have the same display factor as well as an identical units legend. (Upper and lower case letters are distinct; pounds and Pounds are not the same legend.)

9.8.3 Width of cells

Modelling columns are all ten character positions wide; on the presentation page the columns may be set to different widths individually. The allowable width range is from 1 to 51 character positions in any column.

It is not advisable to make presentation cells narrower than 11 character positions (10 for the number; 1 for the terminator) unless the contents are sure to be small. When it is impossible for a number to fit in a cell by scaling, as described above, an asterisk is inserted into the cell.

Cells for scaling legends may be created on the presentation page using the Scaling compositor described below. Subsequently, if any value in the group requires scaling, all entries in the group are automatically scaled and the appropriate legend put into the cell – or cells – created for that particular group. However, a cell for the scaling legend is not obligatory so the program may have nowhere to put the legend. In such a case the terminator of every cell in the group is pressed into service as a cell for the legend. The legend is abbreviated to T for THOUSANDS, M for MILLIONS. The

appearance of some results scaled in this way is illustrated below :

246M
0M
−7M

Scaling legend

With the spotlight on a cell which is to contain the scaling legend of a group type the letters **sc**. The top line becomes : 9.8.4

scaling legend for items from column_ _____ _

requiring a column number (for example M16b) in the first gap. The gap may be left blank if the column number is to be inferred from a zone of influence.

On pressing **return** a nominated column number would be recorded in the spotlit cell on the working side of the presentation page. There would be a gap in the case of an inferred column number. Examples are:

Sc M16b
Sc

The effect is to make a cell for a scaling legend which would be blank on the results side or contain the word THOUSANDS or MILLIONS as necessary. This cell would apply to all entries in the group of modelling columns of which the nominated column is a member.

Any number of these cells may be created for each group of modelling columns. The aim is to make it clear to the reader of the presentation page whether the results being studied are scaled or not; if so by how much.

Rearrange - ment

Areas of the presentation page may be blanked out, shifted laterally, shifted vertically or laid on top of other areas. In doing so the page may be rearranged or a part of the page (say a column) duplicated. **9.9**

The two compositors for doing these things are :

- Copy
- Move

and these are described below. They are powerful compositors to be used with care; it is possible to wipe out a complete composition in a moment of carelessness. The cautious user saves a copy of the moneybook before applying these compositors.

9.9.1 Copy

This compositor causes a copy of one area of the presentation page to be laid over another area of the page. The two areas (copied from and copied to) may overlap.

Fig. 9.5 defines the action of this compositor pictorially and generally. Practical applications are discussed in later sections.

With the spotlight on the cell which is to become the top left-hand cell of the copy type the letters **co**. The top line becomes :

```
copy_   _cells down_   _cells across,
                    starting at cell in row_   _col_   __   _
```

requiring integers in the first four gaps. The required integers are denoted D, W, R, C respectively in fig. 9.5.

On pressing **return** the spotlit cell becomes the new top left-hand corner of the D rows and W columns originally located at row R column C. Any portion of the area to be copied which is not overlapped by the copy remains exactly as it was.

9.9.2 Move

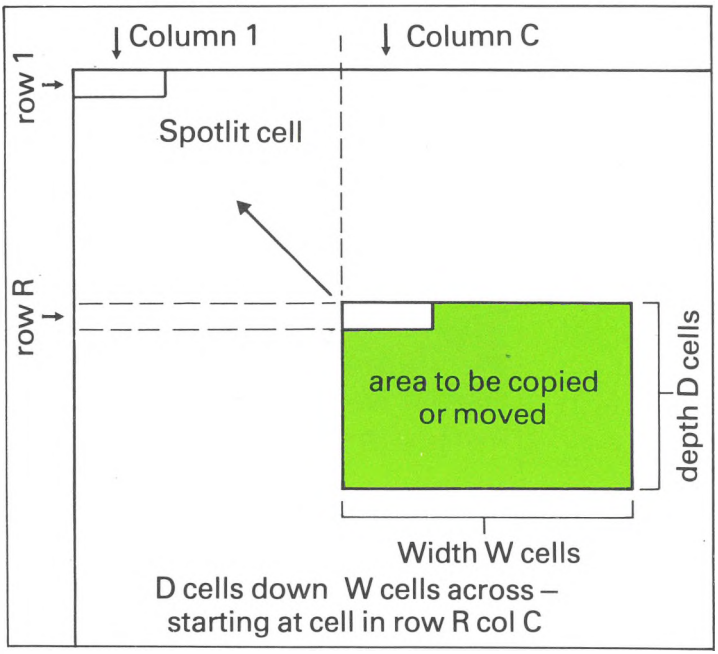
This compositor works the same way as Copy but with one exception; every cell in the area to be moved is blanked out after it has been copied. Thus a blank area is left behind; the full rectangle if there is no overlapping.

With the spotlight on the cell which is to become the top left-hand cell type the letters **mo**. The top line becomes :

```
move_   _cells down_   _cells across,
                    starting at cell in row_   _col_   __   _
```

requiring integers in the first four gaps. The required integers are denoted D, W, R, C respectively in fig. 9.5.

FIG. 9.5
VARIABLES FOR COPY & MOVE



Page boundary

Values given for D and W (fig. 9.5) may be arbitrarily large; for example 99 and 99. This implies such a large area to be copied or moved that much of it would comprise imaginary cells lying beyond the page boundaries. These imaginary cells are assumed to be blank. 9.9.3

Similarly, values given for R and C may be arbitrarily large or the gaps left blank. In either case the top left-hand cell is specified as lying outside the page boundaries. This, in turn, implies blank elements in all R rows and W columns.

By specifying artificial values a blank area may be laid over part of the presentation page thereby blanking out some of the rows or columns (or all of them if done without care).

Application

Three applications are shown below to illustrate duplication of part of a column, deleting a row, inserting a column. 9.9.4

It is common for a presentation page to contain repeated parts of columns – all identical. These may be generated from a single column using Copy. For example, the screen shown in

fig. 9.6 (b) may be generated from that in fig 9.6 (a) using the following top line :

```
copy____10____cells down____1____cells across,
        starting at cell in row____7____col____2___keep
```

The spotlight is moved to the right, column by column, and the top line entered each time by pressing **return.**

A row of entries (row 9) could be blanked out by entering the following top line whilst the spotlight is on row 9 column 1.

```
copy____1____cells down____99____cells across,
        starting at cell in row____9____col____99___ __
```

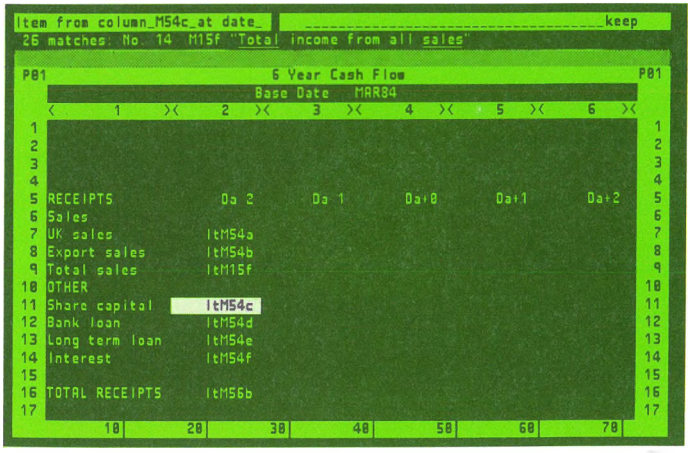
The resulting screen is shown in fig. 9.6 (c).

An extra column may be inserted between existing columns 3 and 4 by moving column 4 and everything to its right. The spotlight would be at the top of column 5.

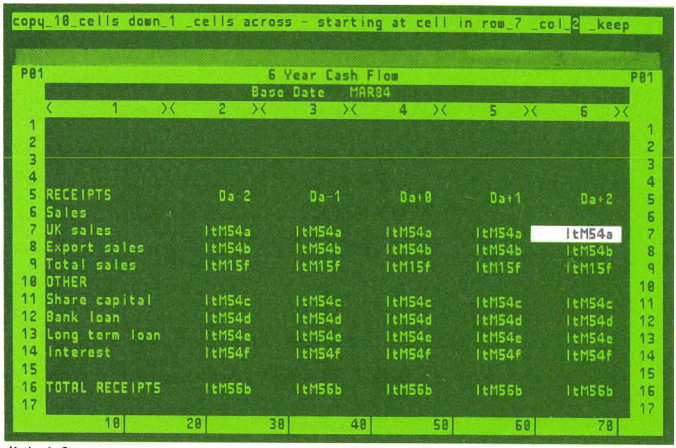
```
move____99____cells down____99____cells across,
        starting at cell in row____1____col____4___ __
```

The resulting screen is shown in fig. 9.6 (d).

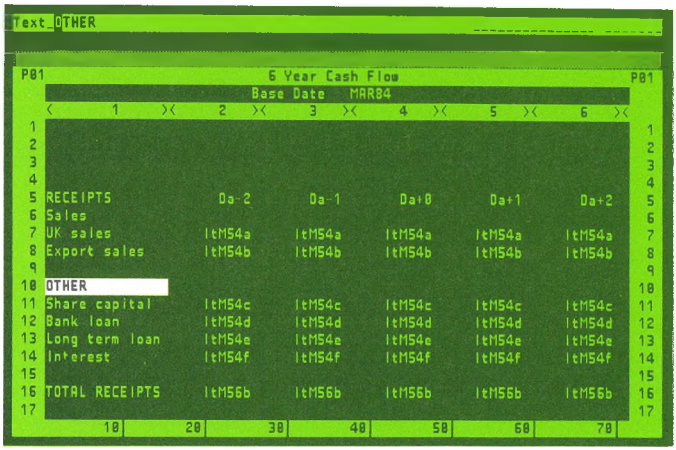
FIG. 9.6
APPLICATIONS OF COPY & MOVE



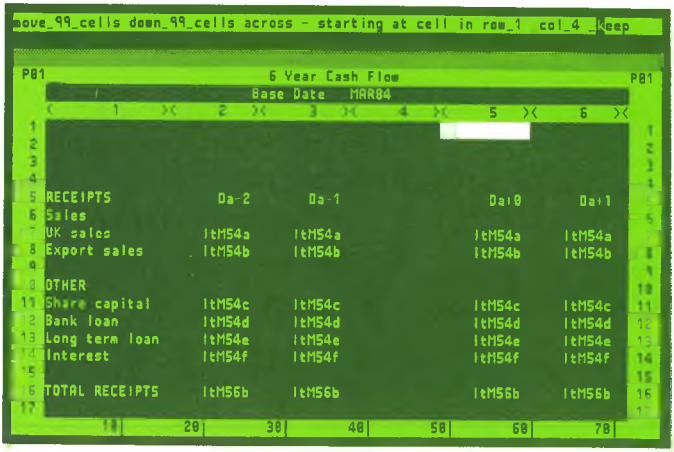
(a) Before copying identical columns



(b) After copying identical columns



(c) Deleting a row



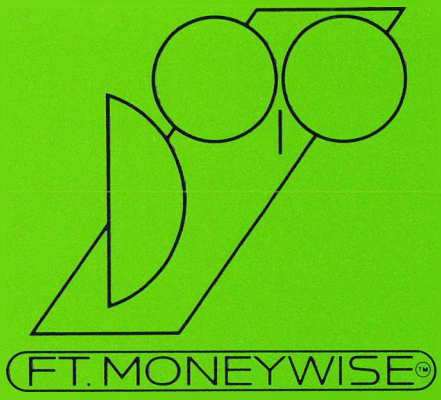
(d) Inserting a column

9.10 Summary of Compositors

The compositors are listed alphabetically below :

copy_ _cells down_ _cells across,
starting at cell in row_ _col_ _____ _
date_ _____ _
difference in column_ _at date_ _over_ _intervals_ _
item from column_ _at date_ _____ _
join to cell in direction_ _____ _
justify_ _____ _
line_ _____ _
move_ _cells down_ _cells across,
starting at cell in row_ _col_ _____ _
scaling legend for items from column_ _____ _
text_ _____ _
title from column_ _____ _
total of column_ _at date_ _over_ _intervals_ _____ _
units from column_ _____ _
width_ _characters across cell_ _____ _

The final gap is for an optional letter **k** (for keep) in every case.



10

Structure of the Moneypost

Structure of the Moneypost

10

The moneypost is the vehicle by which information is transferred between moneybooks.

The concept of a moneypost is introduced in 1.4 and fig. 1.4. Briefly, a moneypost is a file stored on disk. The file contains a selection of pages of a moneybook. The entries on this file may subsequently be copied into a different moneybook. Alternatively the data in the moneypost file may be transferred into a database or word-processing system on the same or a different computer. Similarly the foreign database or word-processing system may generate a file of data, in the same form as a moneypost, which may be copied into a compatible moneybook.

The means of sending a moneypost – and receiving a moneypost from some other moneybook – are described in 4.6. Briefly, a time band is established across the open moneybook by specifying a pair of dates. A selection of modelling pages and summary pages is also specified. When sending a moneypost entries within the specified time band on the specified pages are copied *out* of the open moneybook to a disk file. When receiving a moneypost entries on the disk file are copied, or summed (or even negated and summed) *in* to the specified time band on the specified pages of the open moneybook.

This chapter defines the structure of moneyposts.

A moneypost may be incompatible with the moneybook intended to receive it. The subject of compatibility is examined in this chapter.

File Structure

10.1

The moneypost is a text file. The term 'text file' means a file of characters coded in ASCII form on floppy disks. The file name must be extended by the characters MWP (e.g. TRANS.MWP) if the source of the file is foreign to MONEYWISE.

The moneypost comprises a sequence of items, each on a line by itself. In other words every item in a moneypost is delimited by the carriage return and line feed characters in ASCII form.

There are five kinds of item :

title

number

text

asterisk

terminator

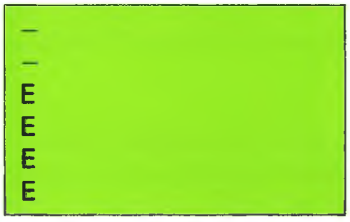
These five kinds of item are described below, following an example moneypost.

When a moneypost is being sent (mode = OUT) all items are generated automatically and would therefore be in the correct form for receipt (mode = IN). But a definition of syntax is nevertheless needed so as to enable the moneypost to be used as the interface between MONEYWISE and other systems for financial modelling and accounting.

10.1.1 Example moneypost

The following shows what a moneypost would look like if printed. (Moneyposts are not usually printed.) The text to the right of the vertical line is explanation; it is not part of the moneypost. It is usual to call each line of such a file a *record*.

Data from branch to H.Q.	First record: always the title
1,234.567	Numerical item
1,202.000	Numerical item
*	Bad item
E	Terminator
0.10	Numerical item
0.15	Numerical item
−25.75	Numerical item
−100.00	Numerical item
—	Numerical item
—	Numerical item
E	Terminator
' January	Text
' February	Text
' March	Text
' April	Text



Text
Text
Terminator
Terminator
Terminator
Terminator

The above is a moneypost comprising a single page of a moneybook, therefore six columns are represented. Each column is terminated by letter E.

The first two columns come from calculated columns or data columns of a moneybook. The third comes from a marker column. (Items in a column may be numbers or text but not a mixture of both.) The three E's terminate empty columns on the page. Longer moneyposts comprise more pages.

Title

When a moneypost is sent (mode = OUT) the title entered at the top of the service screen becomes the first record of the moneypost. The title is limited to 51 characters including spaces; if a moneypost generated by a foreign system had more than 51 characters in the title the excess would be ignored on receipt. 10.1.2

Number

Numbers originally given as data are copied out in the same form in which they are displayed on the screen. Calculated numbers are copied out with seven significant figures and never more than three places of decimals. 10.1.3

Numbers received may have no more than three places of decimals. However, it is not necessary for numbers in the moneypost to be precise multiples of the display factors of the columns which are to receive them.

A zero item may be represented as zero or as a dash (minus sign).

If commas are included they should be positioned every three characters leftwards from the decimal point; nowhere else.

10.1.4	Text	Texts from marker columns are copied out preceded by an apostrophe followed by a space. Then follows the text of the marker. Texts received from a moneypost should begin with an apostrophe followed by a space. Then the text itself must follow, not exceeding 51 characters including spaces. Characters in excess of this number would be ignored.
10.1.5	Asterisk	When sending a moneypost (mode = OUT) the source of numbers may be a data column or a calculated column. If the source is a data column all items, by definition, have the correct syntax. But if the source is a calculated column there may be trouble – division by zero for example. On the results side of the page the result would be replaced by an asterisk. The same course is adopted when sending a moneypost; an asterisk is sent to the file but no further entries from that column are sent. If, when receiving a moneypost, an asterisk is destined for a data column, transmission ceases as soon as the asterisk is encountered.
10.1.6	Terminators	Every column is terminated by a terminator record – a solitary capital E. When a moneypost is sent (mode = OUT) the number of items per column is determined by the dates on the service screen. These dates define the time band hence the number of entries per column to be transmitted. If a column on the nominated page is empty, however, no values are sent to the moneypost; just the terminator. Three such columns are illustrated above. On receiving a moneypost (mode = IN) no error is reported if the time bands in the moneypost and open moneybook do not correspond. Items are copied sequentially from moneypost to nominated column. If there are more items in the moneypost the excess are ignored once the receiving column is satisfied. If there are less items in the moneypost then the receiving column is only partially filled.

Compatibility	A moneypost sent from one moneybook may be received by another with different time span and page selection. The moneypost carries nothing but sequential items of data with no column numbers or dates recorded. Some implications of this are discussed below.	**10.2**
Time band	Suppose the time band of the sending moneybook began in JAN83. If the time band of the receiving moneybook began in FEB83 then moneypost entries for January would go into the moneybook as though they applied to February. There is no check. As explained in 10.1.6, if there were more items in the moneypost than in the time band of the receiving moneybook, the excess would be ignored. Conversely, if there were less items in the moneypost the receiving time band would be only partially filled. A time band may be specified which overlaps the top or bottom row of the moneybook. Implications of this are described in 4.6.5.	10.2.1
Calculated columns	When a moneybook is being sent (mode = OUT) items in calculated columns are sent – from the results side – in numerical form. When a moneypost is being received (mode = IN) items destined for a calculated column are ignored. No message is displayed to say that the data for the column have been ignored.	10.2.2
Consistency	Items received from a moneypost must be in the correct form: numbers for data columns, texts for marker columns. If there is inconsistency transmission ceases and an error message is displayed.	10.2.3
Summary Pages	When a moneypost is being sent (mode = OUT) items on summary pages are sent from the results side. But when a moneypost is being received (mode = IN) the receiving columns are the modelling columns nominated on the working side of the summary page.	10.2.4

10.2.5 Asterisks

If an asterisk destined for a data column is intercepted transmission ceases and an error message is displayed.

11

Printed Pages

Moneyprints are the physical product of the system described in this manual.

Moneyprints may be printed quickly in draft style as illustrated by fig. 11.2(a) or more slowly in fine style as illustrated by fig. 11.2(b). This chapter describes the control of printing style and layout using the service screen that appears when the letter P is typed in response to the prompt for a service.

A service screen is reproduced in fig. 11.1 for convenient reference when reading this chapter.

A satisfactory print layout is usually achieved by filling the empty cells of fig. 11.1 according to the instructions given in 4.8. But occasionally it may be necessary to change some of the other pieces of information shown on the screen :

- the list of paper dimensions shown on the right of the service screen
- the number of characters per inch (cpi) in horizontal pitch
- the number of lines per inch (lpi) in vertical pitch
- the legend which shows what type of printer is to be employed.

This chapter describes the implications of such data and explains how they may be changed.

FIG. 11.1 PRINT SERVICE SCREEN

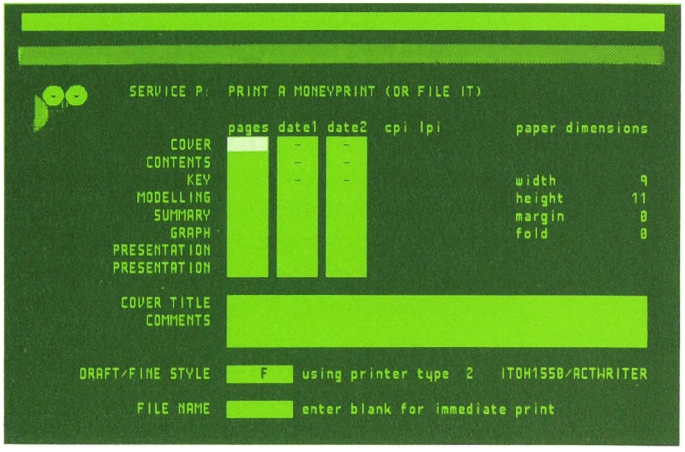


FIG. 11.2
DRAFT AND FINE STYLES

6 Year Cash Flow

	DEC84	DEC85	DEC86	DEC87	DEC88	DEC89
RECEIPTS						
DEBTORS						
UK sales	93,269	981,720	1,748,215	2,020,987	2,204,956	2,364,367
Export sales	-	219,690	435,062	549,563	700,670	904,931
OTHER						
Share capital	100,000	-	-	-	-	-
Bank loan	75,000	-	-	-	-	-
Long term loan	25,000	-	-	-	-	-
Interest	16	0	0	21,938	71,645	125,923
TOTAL RECEIPTS	293,285	1,201,410	2,183,276	2,592,488	2,977,271	3,395,222
PAYMENTS						
CREDITORS						
Production	51,615	489,705	874,251	1,033,285	1,161,512	1,221,101
Overheads	429,328	786,752	815,441	1,007,024	1,253,141	1,564,634
VAT			72,612	89,764	88,300	99,744

(a) Printing in draft style

6 Year Cash Flow

	DEC84	DEC85	DEC86	DEC87	DEC88	DEC89
RECEIPTS						
DEBTORS						
UK sales	93,269	981,720	1,748,215	2,020,987	2,204,956	2,364,367
Export sales	-	219,690	435,062	549,563	700,670	904,931
OTHER						
Share capital	100,000	-	-	-	-	-
Bank loan	75,000	-	-	-	-	-
Long term loan	25,000	-	-	-	-	-
Interest	16	0	0	21,938	71,645	125,923
TOTAL RECEIPTS	293,285	1,201,410	2,183,276	2,592,488	2,977,271	3,395,222
PAYMENTS						
CREDITORS						
Production	51,615	489,705	874,251	1,033,285	1,161,512	1,221,101
Overheads	429,328	786,752	815,441	1,007,024	1,253,141	1,564,634
VAT			72,612	89,764	88,300	99,744

(b) Corresponding page in fine style

11.1 Pitches

The spotlight may be moved across from the date cells and be positioned at cells (otherwise invisible) beneath the headings **cpi** and **lpi**. These signify horizontal pitch measured in characters per inch and vertical pitch measured in lines per inch respectively.

These cells are usually left blank to signify automatic selection. The pitches selected automatically are suitable for most applications. Intervention may be needed to achieve some special layout or when the type of printer is set to 1 (see 11.3) but not switched to 10 cpi and 6 lpi.

The horizontal and vertical pitches may be varied from page to page by putting numbers in the cells under cpi and lpi. This may be done by spotlighting each cell and entering a value just as

	with ordinary cells. However, the pitch cells are usually left blank.	
Horizontal pitch	On most printers a selection of horizontal pitches is available. When a pitch cell is left blank on the service screen one of the available pitches is selected automatically such that the printing conforms to the page width specified on the right of the screen. If a pitch is entered on the screen the widest available pitch is adopted that is no wider than the pitch entered. If no available pitch meets this requirement then the closest pitch to that on the screen is adopted. Even so it is possible for the print area to be too narrow for the required material in which case the rightmost characters would be lost. The remedy is to adjust the page or margin width as described later.	11.1.1
Vertical pitch	A typical printer provides pitches of 8 and 6 lpi. Others permit a greater range; for example, 8, 6, 4 and 3 lpi. When a pitch cell is left blank the program selects one of the above pitches automatically as follows. First a pitch of 8 lpi is tried and the necessary number of printed sheets computed. Call this number N. Then pitches of 6, 4 and 3 are tried in turn. The widest pitch is adopted that would allow the text still to fit on N sheets. If a pitch is entered on the screen it must be 8, 6, 4 or 3. The widest available pitch is adopted which is not wider than that entered. If no available pitch meets this requirement then the available pitch closest to that on the screen is adopted.	11.1.2
Permanence	When pitches are entered under cpi and lpi for one or more pages these values are saved as properties of the moneybook.	11.1.3

11.2 Paper Dimensions

The spotlight may be moved to the right to the part of the screen where four paper dimensions are recorded. These dimensions may be spotlit and changed in the same way as data in ordinary cells.

There is a fundamental difference between paper dimensions and data in ordinary cells. Paper dimensions, once changed, retain their new values even when another moneybook is opened.
The significance of the paper dimensions is shown in fig. 11.3. All dimensions are measured in inches.

■ Width is the permissible travel of the print head and is not directly related to the size of stationery in the printer (e.g. narrow pages may be printed on wide paper).

■ Height is the distance between perforations, or, in the case of individual sheets, the feed distance from the top of one sheet to the top of the next

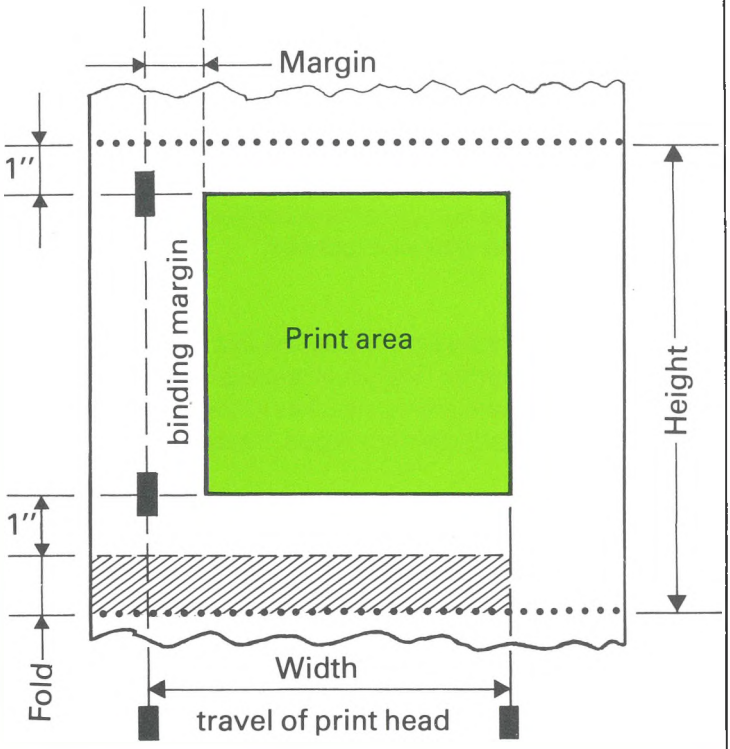
■ Margin is the width of filing margin measured from the home position of the print head

■ Fold applies only to stationery in individual sheets. It specifies a dead space (on which there may be no printing) between consecutive sheets. This item should normally be zero when using fan-fold stationery.

The print area is declared to be (Width minus Margin) inches wide and (Height minus Fold) inches deep. The print area is further reduced (by two inches on a presentation page or by three inches on other pages) to allow adequate space at the top and bottom of each sheet for standard headings.

For the print area to be located as shown in fig. 11.3 the paper must be inserted such that the print head is initially about an inch below the top edge of the first sheet of output.

FIG. 11.3
PAPER DIMENSIONS



Types of Printer

When the spotlight is moved just to the right of :

Using printer type

it is possible to enter a number to denote the type of printer connected.

A value of 1 indicates a basic printer capable of printing only in draft style. Characteristics of draft style are described in 11.4. A printer of type 1 is assumed to operate at 10 cpi and 6 lpi unless specified otherwise.

A type 1 printer should be specified if a moneyprint about to be filed will subsequently be processed by another computer system.

A value from 2 upwards signifies one of the more elaborate printers that may be used with the system. Entering a number

causes the name of the associated printer to be displayed. For example, the Epson FX/RX-80 is shown to be associated with 4 as follows:

```
using printer type 4 EPSON FX/RX-80
```

The reader may discover what printers it is possible to connect by pressing help.

The number entered remains set – even when a new moneybook is opened.

11.4 Draft and Fine Style

Printing in draft style is fast; printing in fine style is slower but prettier. The usual practice is to use draft style until confident there are no mistakes in the model or improvements to be made before a report is submitted.

Draft style is indicated by a letter D on the service screen in the appropriate cell. However, if the printer type is set to 1 (on the same line of the screen) this implies draft printing because the 1 specifies a simple printer incapable of fine printing.

The only limitation imposed by specifying draft, rather than fine, printing is that lines are drawn using full stops and colons.

12

Changes to a Moneybook

Changes to a Moneybook

12

Changes to a moneybook are easily made; the means of making changes – which sometimes require a column to be deactivated or exterminated first – are described in this chapter.

When experimental changes are made (in other words 'What-if?' questions asked) a copy of the moneybook to be altered should first be saved. The reason is simple: after making a change it is easy to forget what was there before. But if a copy is saved before any changes are made there is no need to remember (and subsequently restore) the original figures. The need to be methodical when choosing names for filed moneybooks is emphasized in this chapter.

The two essential features of making a change to a moneybook are as follows :

- the new information displaces the old so the old information is lost unless a copy of the moneybook is filed before the change is made
- the effect of any change is immediately propagated throughout the moneybook; its influence may be seen by turning up any of the pages affected.

Making a Change

12.1

The contents of most cells may be changed easily without altering the structure of the moneybook. Other changes, however, demand structural changes. Both kinds of change are discussed below.

Simple changes

12.1.1

Changes to most cells of the moneybook may be made in three steps :

- move the spotlight to the cell (after which the contents of the cell appear in the top line of the screen)
- edit the top line (this could involve deleting the top line and retyping it)
- press return.

The effect of such a change may be seen immediately on turning the page by pressing f1.

On making any change its effect throughout the moneybook is immediate. Other affected pages may be turned up so as to verify this.

12.1.2 Modelling data

In the body of a data column the number in any cell may be changed to another number as just described. Likewise in the body of a marker column the text in any cell may be changed to another text. Also the formula in a calculated column may be changed to another formula.

A modelling column may be :

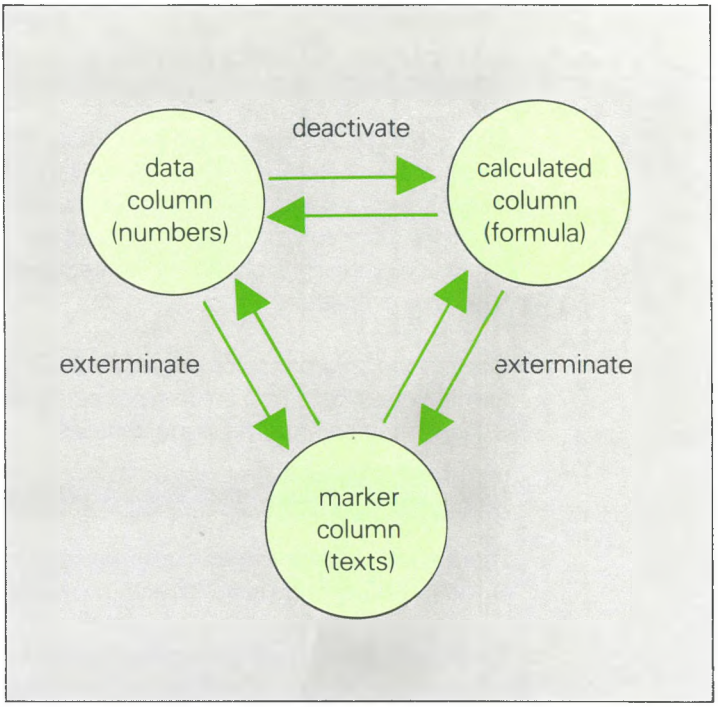
- a data column (containing numbers)
- a marker column (containing texts)
- a calculated column (containing a formula)

and, whereas the contents of any column may be changed to other contents of the same kind, changing to another kind is impossible by the simple means described above. The column must first be deactivated or exterminated.

Deactivation causes the loss of everything in the body of the deactivated column – the numbers or the formula – but title, units and the logical dependence of other columns upon it are preserved. Extermination, on the other hand, removes everything – as though that column had never existed.

Fig. 12.1 shows whether the required change involves deactivation or extermination. Each circle represents a different kind of modelling column; the pairs of arrows represent conversions from one kind of column to another. On each pair of arrows is indicated the necessary procedure (deactivation or extermination) before the required change is possible.

FIG. 12.1
CHANGING THE TYPE OF A COLUMN



Deactivation

Deactivation is described both in 6.2 and in 7.2. 12.1.3

Briefly: with the spotlight on the column to be deactivated clear the top line. If the column contains a formula then type =**de**. If the column contains data entries type **de**.

Deactivation has to be confirmed by pressing **return** or refused by moving the spotlight away from the column in jeopardy.

The deactivated column may be made into a calculated column by entering a formula or made into a data column by entering a number in any of its cells.

The deactivated column retains its display factor, title and units. Any calculated columns dependent on this column remain dependent upon it.

It is impossible to put a text into a cell of a deactivated column. To do this it is first necessary to exterminate the column.

12.1.4 Extermination

To exterminate a modelling column – or a page containing modelling columns – the prompt for a new page should be in the top line. If it is not already there press **leave**. The prompt is :

Page please :

to which the response should be X (or x), followed by a space, followed by a column number; for example **X M16a**. This would signify a single column to be exterminated. Alternatively a page number could be given – for example **X M16** – to signify all occupied columns on the nominated page. Then **return** should be pressed.

If any of the columns to be exterminated is referred to by a formula elsewhere (in a column not being exterminated) there is a beep and an error message appears :

Column(s) to be Xterminated are referred to by others

There is also a beep and an error message if an empty column or totally empty page is nominated by mistake.

But if the columns to be exterminated are neither referred to by others nor empty an ominous cross appears over the material about to be exterminated. The top line displays a question seeking confirmation to proceed :

O.K. to Xterminate ?

and this must be answered yes or no (y or n for short).

If this question is answered 'no' the cross disappears from the columns in jeopardy.

If the question is answered affirmatively (type y, then press **return**) the contents of all the columns under the cross disappear entirely; display factor, title, units, body of column and all. All references to the exterminated columns also disappear from the contents page, key page, summary pages, graph pages and presentation pages. It is as if the exterminated columns had never existed.

When extermination is refused, on grounds that the column is referred to by others, it is simple to discover which are the

other columns concerned. They may be searched for as described in chapter 8. Briefly: type the column number in quotes. The search line then shows, for example :

1 matches No. 1 M16a "Wages & Salaries"

Then successively pressing **next use** would reveal all columns which make use of M16a in their formulae.

Summary, graph and presentation pages may be exterminated as described above. Type letter X followed by a space. Then type the number of the page to be exterminated, for example S1, G3, P2. Then press **return**.

Any bookmark associated with an exterminated page is automatically released.

Effects of a Change

A change is made on the working side of a page but the primary effect of such change is usually to be seen on the results side. To see this effect it is only necessary to press **f1** after which the page may be turned back to its working side by pressing **f1** again.

Other effects of the change would be evident on other pages – graph pages in particular. Bookmarks may be set to such pages so that they may be turned up quickly after making the change. The means of setting bookmarks are described in detail in 3.8.7, but briefly :

- press **leave** to make the top line prompt for a page number
- press **leave** again to make the top line prompt for a service
- enter B (or b) for the bookmarker service.

The service screen for bookmarks should then appear. Page numbers of any kind (C, K, M, S, G, P) may then be entered in cells corresponding to bookmarker keys **f2** to **f5**.

Subsequently, on making a change to the moneybook, it is possible to display pages with sensitive data (on their results side) by pressing corresponding bookmarker keys. So to optimize a change – say to find a selling price that would just

prevent the profits curve dipping into loss – several values could be tried. On each trial the profits graph would be displayed by pressing its bookmarker key.

Suppose a moneybook had three graph pages, each sensitive to an adjustment of the kind described above. There is nothing to prevent each of these pages being associated with its own bookmark but this is not really necessary. If page G02 were given the bookmark f2 then pressing f2 would cause display of page G02. But pressing previous page would then cause display of G01. Alternatively next page would cause display of G03. In general, when bookmarks would be close together in the same section of the moneybook (M, S, G, P) it is enough to set a single bookmark and make use of the keys for leafing through pages : previous page and next page

12.3 Filing a Copy

A moneybook is a growing and changing organism. The effect of every addition and every change spreads through the moneybook. It is easy to make an experimental change by replacing a few numbers, only to forget what values were originally there. So it becomes impossible to restore the moneybook – with certainty – to its state prior to the experiment.

Disasters such as that described above are easily prevented: a copy of the moneybook should be saved before making the experiments and afterwards restored as necessary.

The means of saving the open moneybook on a file are described in 4.6. Briefly :

- press leave to make the top line prompt for a page number
- press leave again to make the top line prompt for a service
- enter S (or s) for the save service.

The service screen for saving a copy of the open moneybook as a file should then appear.

When completing the service screen it is possible to record a modified title and a new set of notes with the filed copy. This feature is helpful for keeping track of filed moneybooks which proliferate unless filed systematically. There is more about keeping track of files in chapter 13.

13

File Management

File Management

13

Before experimenting with a moneybook a copy should be saved as previously explained. But it is also advisable to take such copies regularly so that an entire moneybook is not lost should something go wrong with the current version. One way to take back-up copies systematically is described in this chapter.

A moneybook may hold confidential information; some advice about privacy of files is given in this chapter.

No disk, whatever its quality, should be considered completely reliable. This chapter recommends duplication of disks so as to avoid losing programs and files.

Back-up Copies

13.1

It is good practice to file a copy of the open moneybook at regular intervals whether experimenting or not. It is always possible to make silly changes in a moment of mental aberration; a copy made the day before could then be restored with relief.

To guard against operational errors such as the silly changes discussed above it is enough to take regular copies without changing the disk in the moneyfile drive. However, there is added security in changing this disk and little effort involved in doing so. Saving on a separate disk is especially recommended if a colleague is to be allowed access to one's moneybook.

Whether filing on the same or another disk it is essential to be systematic. Without a system files proliferate; it soon becomes impossible to know what they hold and why they have been kept. Two methods of identifying back-up files and preventing proliferation are:

- composing a suitable title and descriptive set of notes on the service screen when filing a copy of the open moneybook

- adopting a cyclic (or other systematic) scheme for naming the file.

These two methods of organising back-up files are discussed separately below.

13.1.1 Title and notes

When the open moneybook is filed its title and notes may be altered on the service screen.

Suppose, for example, the title and notes in the open moneybook were as follows :

```
David Foster's Project
Travel costs included
```

These might be edited on the service screen so that the title and notes on the filed copy would be :

```
David Foster's Project (Backup)
Travel costs omitted
Backup copy made on 11.6.83.
```

The above title and notes are displayed on the screen when this file is later retrieved.

13.1.2 File names

A manageable system is essential when naming files. Recall that a previous copy of a moneybook – if on the same moneyfile disk – is wiped out if the name is used again. (There is a warning displayed and a chance to retreat under such circumstances.)

The naming system could work cyclically, always holding two back-up copies on the disk. Every time a copy of the open moneybook is filed it is made to replace the older of the two already there. This system could be implemented as described below, but this is only an example; the reader is sure to think of better schemes :

- begin every file name with the initials of the title (DFP for the previous example)

- Append OLD to the name of the older copy, NEW to the name of the newer.(DFPOLD and DFPNEW in the previous example)

- When filing DFP always use the name DFPOLD so as to replace the older version

- immediately swap the names DFPOLD and DFPNEW.

The best way to swop names is to use the renaming facility (see 4.7) three times:

rename DFPNEW as X;

rename DFPOLD as DFPNEW;

rename X as DFPOLD.

Privacy 13.2

There are three kinds of file that can be stored on disk :

Moneybook

Moneypost

Moneyprint

Moneyposts and moneyprints are stored in character form. Anyone able to use the computer's operating system – even in the simplest way – could cause moneyposts and moneyprints to be printed. So there is no inherent privacy in them. Moneybooks, on the other hand, are stored in a form comprehensible only to the MONEYWISE system so only those who have access to this system may examine moneybooks left on a moneyfile disk.

The last sentence in the paragraph above is not strictly true; 'cracking' codes is a game enjoyed for its own sake by many computer enthusiasts; the moneybook is no proof against them.

The only rule for proper security, therefore, is to ensure that confidential files are on disks locked away. If it is essential to pass information in disk form to others, the information should be prepared as a moneypost – taking care there are no confidential files on the same disk.

Disk Management 13.3

A moneybook (or other file or program) may be lost without warning through a variety of causes beside the stupidity of operation already discussed. Other reasons could be :

- power surge
- power failure

- fire
- failure of disk drive
- overheating of disk surface

and more.

For protecting moneybooks against failures in operating procedure a systematic back-up system is recommended. For security against physical damage the back-up copies should be stored somewhere away from the computer.

Copies of moneybooks, moneyposts and moneyprints may be made on any disk already prepared for files – this disk is simply put in the moneyfile drive just before copying. But it is also possible to copy a complete disk (including programs as well as files) using the Manager as explained in 2.6. In this case any disk will do – it does not have to be prepared.

Users of hard disks should transfer files at regular intervals to floppy disks for safe keeping. Because of the relatively large amount of information on a hard disk its failure is potentially more disastrous than that of a floppy.

14

Capacity

Capacity

The capacity of every moneybook has specific limits; for example the maximum number of modelling pages and the number of rows on each. Specific limits are given in this chapter. Other limits cannot be specified in simple terms; they become evident when exceeded.

When saving a moneybook, moneypost or moneyprint it is possible to exceed the capacity of the disk. This chapter summarizes the remedies available should this happen.

When working on large moneybooks it is possible to exceed the capacity of various parts of the memory. This chapter explains what remedies are available in such circumstances.

If the disk or the memory overflows it does not mean that work is lost or a file damaged. It is usually possible to create space, on disk or in memory, and continue with the action that was interrupted.

14

Specific Limits

14.1

The following limits on capacity may be specified by number or formula.

Pages

14.1.1

There is precisely one contents page and one key page. There may be up to 67 modelling pages from M01 to M67. Denoting summary pages, graph pages and presentation pages by S, G, P respectively, the limit on their number is imposed by the expression 8S + 16G + 18P being no greater than 500. If this limit were reached it might be possible to sacrifice a presentation page, for example, in order to gain an extra graph page.

Columns

14.1.2

There may be up to 402 modelling columns, each comprising as many as 168 rows. It is still allowable to refer to items beyond row 168 (and prior to row 1) and the program assumes these items are dashes.

14.2 Memory Overflow

The following are limits which become evident only when working on a large moneybook.

14.2.1 Text space

Texts are used for page titles, column titles, units legends, markers in marker columns, annotation on presentation pages. These may become too many or too verbose for the part of memory allocated.

If an error message explains that text space is exceeded it may be possible to regain space simply by saving and re-opening the moneybook. If this does not release enough space it should be possible to gain space by making existing texts less verbose.

14.2.2 Presentation pages

An error message may appear on an attempt to put information into a cell on a presentation page. This would indicate that a special part of memory devoted to presentation pages has overflowed. The only remedy here is to use fewer presentation pages or prune some of the information on existing presentation pages.

14.2.3 Workspace

The workspace is defined as the combined capacity of the computer's memory and a 'scratch file' on disk. The work space may possibly overflow :

- when putting information into a data or marker column
- when putting information into a cell on the presentation page
- when turning a page.

The remedy is to try deleting unnecessary data or marker columns and blanking out superfluous cells on presentation pages. If this does not release enough space the open moneybook should be saved. Further memory boards could be installed or more space made on the scratch file. For the size of the scratch file refer to the installation card.

Disk Overflow

An empty disk should provide enough space for saving a copy of the largest possible moneybook.

But usually a disk is used to hold many files; moneybooks, moneyposts, moneyprints. So it is useful to check the list of files on a disk, how much space they occupy, how much space is left. This may be achieved as described in 2.7 and 2.8.

Disk overflow can occur only whilst filing a moneybook, moneypost or moneyprint. If a message appears saying the disk is full the first remedy is to use the deletion service on unwanted files. When using a hard disk this is the only remedy, except that files may be copied to a floppy disk, if available, rather than deleted.

The other remedy is to change the disk in the moneyfile drive. An empty disk may be substituted as long as it has been prepared. In doing so the spotlight must be moved from the cell labelled O.K. TO FILE? to the one labelled FILE NAME. This procedure, and the precautions to be observed, are described in 4.6.4.

DESIGNING THE LOGO AND BANNER

The Moneywise Logo and Banner

On the printed page the 'logo' and 'banner' enhance the appearance of a moneyprint. They have dimensions fixed by a graphics designer to ensure aesthetic balance.

The logo is an area about one inch square of dot matrix printing. It appears near the top left hand corner of all printed pages other than presentation pages.

The banner is a strip just beneath the logo and running across the page. (On a presentation page there is no logo and the banner appears at the bottom).

The logo is variable; its dot matrix pattern may be freely composed.

The banner is variable; any text may be embedded within it. The letters of the text are styled when printed so that each appears much wider than when shown on the screen.

The logo design program enables both logo and banner to be adapted to the user's design.

To run the logo design program

Leave the Moneywise system (see section 2.2 of the User Manual) to obtain the operating system prompt >

Insert the Tutorial disk into the floppy disk drive designated by the default drive letter. (The default drive letter appears in front of the >. It may be changed by typing a new letter followed by a colon, then pressing [return].)

Then type :

MWLOGO [return]

unless you are using a colour graphics adapter and monitor on an IBM Personal Computer in which case type :

MWLOGO 04 [return]

The program then offers the options of composing the logo or composing the banner.

After selecting one of these options hold down the [help] key to obtain further information on how to proceed. (The positions of such basic control keys are identified on the Reference Card).

Either activity, once selected, can be abandoned by pressing the [leave] key (another control key). The effect would be a reversion to the options screen.

The options screen offers a choice of further composition, or of storing the latest logo and banner, or of leaving the program.

The logo option

Of the rectangular dot matrix area forming the printed logo only a central vertical band (four-fifths of the logo width) is accessible for composition.

The composition area is shown greatly magnified on the screen when the logo option is selected.

In the composition area there is a blinking cursor which can be moved about using the numeric keypad. Press [help] to learn how.

As the cursor is moved each matrix dot in its wake is left behind in one of the following 'paint modes':

white mode : set white
black mode : set black
neutral mode : previous colour unaltered
reverse mode : previous colour reversed

The paint mode in use (indicated by a legend at the bottom of the screen) can be changed by pressing number key 0. When the cursor is stationary the colour of the dot which it covers can be seen without moving the cursor away. Over a white dot the flashing cursor spends most of its time white; when over a black dot the flashing cursor spends most of its time black.

The two vertical edge strips, which are not in the composition area of the logo, are either both white or both black. They take their colour from that of the top left dot of the composition area.

The settings of all the dots in the logo can be reversed by pressing [f2]. Pressing [f1] has the effect of turning all dots black.

Logo composition may be abandoned or resumed at any time. Pressing [leave] breaks composition and causes the main options screen to be displayed.

The banner option

When this option is selected the rectangle for a logo and accompanying banner strip are shown blocked out on the screen.

An editing cursor is shown in the banner strip.

Text can then be typed into the banner strip and edited using the editing keys defined on the Reference Card.

The text set up in this way becomes the text imbedded in the banner strip when a page is printed. However, the printed characters are attractively formed, and generally wider, than those appearing on the screen during composition.

Banner composition may be abandoned or resumed at any time. Pressing [leave] breaks off composition and causes the main options screen to be displayed.

Storing the logo and the banner

After reverting to the main options screen the option to store the logo and banner may be selected. This has the effect of replacing the currently stored version with the most recent composition - though there is no visible sign of this activity.

The stored version provides the starting point for the next occasion on which the logo design program is run.

Installing the logo for use in printing

The composed banner and logo are stored in a file called MWLOGO.CHR.

For this file to be used, it has to be copied from the Tutorial disk onto a disk area where it can be accessed by the Modeller during printing.

For a standard twin-floppy installation MWLOGO.CHR must be on the Moneywise system's right-hand Start-up Disk.

On other installations the required file should reside on the drive/sub-directory containing MWP*.PRF (where * varies according to the version number).

To copy the MWLOGO.CHR file across to the area where it can be accessed it is necessary to exit from the logo design program (using the main options screen) and then make use of the COPY utility described in the operating system reference manual.
(First rename the already installed MWLOGO.CHR if you may want to revert to using it again.)

Improving the result

After the accessible copy of MWLOGO.CHR has been made the Moneywise system should be run to obtain a sample moneyprint.

If the printed appearance of either logo or banner needs modification, such modification may be made using the logo design program as already described.

Remember to copy the revised logo file across after correction.

Printing the logo in a moneyprint

A moneyprint ordered with **D** (draft) or **F** (fine) style will automatically feature the installed logo and banner.

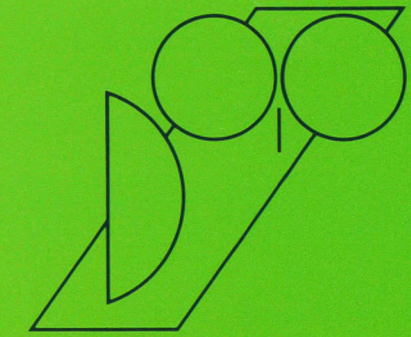
They can be suppressed by specifying **D-** instead of D or **F-** instead of F.

Oki Microline 84 Printer

This printer should produce correct moneyprints from Moneywise when controlled directly by the Modeller.

A graph page, a cover page or a page embellished with a logo will not be printed correctly :

a) if the printer has an added buffering device, or
b) if the pages are printed from file.



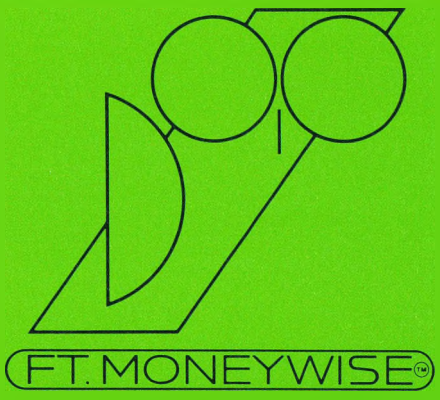
Index

Entries in successive sub-sections are identified thus:
column number in sections 5.5.5 and 5.5.6 is shown as 5.5.5-6.

D

N

T



Glossary

Ascii	American Standard Code for Information Interchange. A character coding convention allowing information generated on one computer to be understood by another computer.
Back-up	Taking a copy of a set of information on another storage medium so that should the source copy become corrupt, the back-up copy is available for recovering the information.
Byte	The grouping of binary digits which a computer handles as a unit. Typically each byte holds one character (eg. letter, numeric or punctuation symbol).
Carriage return	The keyboard character terminating a line of information. In conjunction with the line feed (q.v.) character, it is recognised by the computer as the end of one record (q.v.) of information and the start of the next.
Characters per inch	(cpi) The spacing of characters horizontally across a printed page. The closer the characters, the more characters per inch of page width.
Clock	The internal register holding the date and time. On computers without auxiliary power supply, it needs to be reset after the computer is switched on.
Communica - tions	The ability to pass electronically coded information between computers, whether by direct cable link or by telemetric transmission.
Consolidation	The process of combining analogous sets of data to arrive at a grand total set.
Control keys	The special keys on the keyboard used to control the program. The names used in this manual describe their function but they are not necessarily engraved on the keys themselves.
Cursor	The position on the screen where the next character – input from the keyboard – will appear. It is usually identified by a contrasting space on the screen. Within Moneywise it is constrained to the top line.
Database	A structured collection of data stored within, and accessible by, the computer.

Disk	A data storage medium in which information is stored electronically on a magnetisable coating in concentric circular tracks. Data may thus be read from, or written to, the disk at speed.
Disk key	See plug key.
Drive	The device used to read and write a disk (q.v.).
Fanfold	Continuous printer stationery folded to allow for ease of feeding to a printer.
File	A cohesive set of information stored on disk (q.v.) and accessed by its filename. May contain either programs or data.
File extension	Up to three letters following the filename to identify different types of file. Thus Moneyposts have the file extension 'MWP.'
Floppy disk	An easily portable flexible disk (q.v.) inserted into the door of a disk drive for storing information. It needs to be formatted (q.v.) or prepared before initial use.
Formatting	The process of preparing an empty disk to allow files of information to be written to it. A disk already containing files may be re-used by formatting it. All information previously on it would be lost.
Hard disk	A disk (q.v.) permanently retained within the machine allowing for greater storage capacity and faster access than a floppy disk.
Iteration	The repetition of a sequence of calculations in order to refine a result.
Justification	The process of aligning a text or datum within its reserved space.
Key	See plug key.
Linefeed	The character causing the screen contents or printer stationery to move upwards one line, usually in order to enable the next line to be displayed.
Lines per inch	(lpi) The spacing of lines down a printed page. The closer the lines, the more lines per inch of page height.

Looped definition	A formula placed in a column whose calculation depends on values in another column, itself derived from this column.
Manager	The program within Moneywise responsible for activating the Modeller (q.v.) and basic housekeeping chores (such as preparing disks).
Modeller	The program within Moneywise responsible, as its name implies, for handling the financial modelling requirements. It allows for input of data and formulae, calculation and display or output of graphs and tabular presentations.
Moneyfiles	The individually named datafiles accessed by Moneywise for storing Moneybooks, Moneyposts or Moneyprints.
Moneyfile drive	The designated drive (q.v.) in which Moneyfiles may be accessed or produced. It is identified on the Reference Card.
Moneywise	The MONEYWISE PROGRAM is the name of the financial modelling system. It is a trade mark of Moneywise Software Ltd.
Null	In Moneywise, the absence of any character between quote marks.
Operating system	The programs which perform the basic operational tasks of the computer such as input/output control and file management.
Pitch	A density of spacing (either vertically or horizontally) to which a printer can be adjusted.
Plug Key	The full set of Moneywise facilities is available only when the key to the system is in place. The key may be a plug – to be inserted into a socket at the rear of the machine – or a special disk to be inserted into a particular drive. Check with the reference card to determine how the key is used on your machine.
Precision	In the Modeller, calculation is performed to at least nine figure accuracy.
Printing head	The printer's device through which characters are transferred to paper.

Program	In Moneywise, the Manager and Modeller (q.v.) programs are stored lists of machine instructions operating in response to information input from the keyboard.
Qwerty	The layout of the top row of letters on most British keyboards.
Record	The set of information delineated by the carriage return, line feed symbols (q.v.). One or more records make up a file (q.v.). Normally records within a file are all of the same type in order that they may be processed in the same manner.
Scratch file	A temporary file (q.v.) used to hold intermediate calculations. The user is not aware of its existence unless insufficient space is available on the disk to which it is assigned.
Scrolling	Allowing a page of information, longer or wider than the size of the screen, to be displayed. It is as though the screen is moved across or down the page. In reality the information on the screen is moved in response to operation of the scrolling control keys.
Significant digits	See Precision.
Top of form	The positioning of stationery in the printer to allow tabulation to start near the top of the sheet. Otherwise the printed page crosses a page boundary.
Word processing	A computer system specifically for handling textual information.

THE F.T. MONEYWISE PROGRAM TUTORIAL

CONTENTS

TUTORIAL SECTION A

Introduction

Moneywise is a financial modelling program that works in a different way from the conventional spreadsheet or language-based package. This Tutorial is designed to show you, by hands on experience, how to use Moneywise to build financial models.

How to use this tutorial

A 1

The first section contains a short overview of Moneywise. It does not attempt to show all the facilities: it demonstrates the basic structure of a 'moneybook' in a simple business analysis model.

The next four chapters cover the basic preliminaries of Moneywise. Each involves starting from a prepared moneybook and you build, in simple steps, towards the business model demonstrated in the overview. Each chapter is self contained and designed to assist you to understand the techniques being used. Concluding each chapter is a list of the topics covered. These are cross-referenced to the User Manual should you wish to pursue the topic further. With each chapter there is a corresponding moneybook showing the result of each lesson; you can compare your efforts with ours. After the completion of these chapters, we believe you will have sufficient knowledge to develop your own moneybooks.

The next section puts the points made in the previous section into perspective. It discusses the principles underlying Moneywise and covers some basic administrative details before you start developing your own models.

The final section contains six lessons covering several applications. Besides giving you a basis to relate to your own applications, they describe further techniques you may need to develop more complex models. Initially we recommend you browse through each of them, then as you feel the need to extend your knowledge locate the appropriate lesson and work through it. However, the tutorial does not demonstrate every possible facility. The user manual should be referred to for this.

Before you start We recommend you familiarise yourself with the keyboard. Because of the variation in types of keyboard, Moneywise adopts a standard terminology. Thus help refers to a particular key on the keyboard. Its location on the keyboard may be found using the Reference Card. Alternatively, the special Moneywise labels may be attached to the front of particular keys. Use the Reference Card to identify the keys to which the labels should be stuck. **A 2**

You must install the supplied program to work on your computer, using the Installation instructions supplied. We also recommend that you take a copy of the supplied Tutorial disk and work with this.

Overview This overview introduces the basic structure of Moneywise. It shows: **A 3**

- starting up Moneywise
- using the Manager
- calling the Modeller
- opening a moneybook
- viewing a simple model
- closing down.

Getting started Switch the computer on.

Insert:

- the Start-up Left hand Disk in the left hand drive
- the Start-up Right hand Disk in the right hand drive.

The Installation card will tell you how to create these if the system has not yet been installed. If you have a hard disk system, or are in doubt about your system configuration, check with the Reference Card.

The Reference Card also helps if uncertain about the keyboard layout.

After a few moments the Manager's screen will appear (see fig. 1).

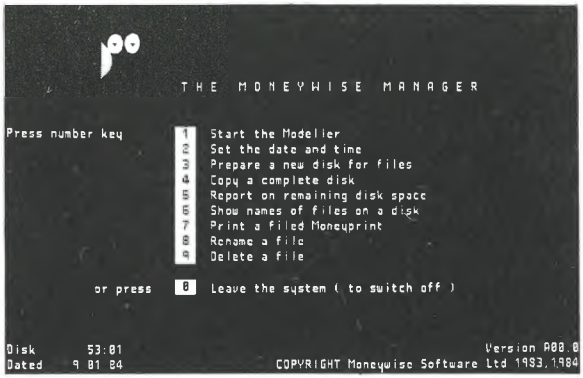


Fig. 1 The Manager's screen

Moneywise key Access to your system is protected by the Moneywise key. For some systems, it is a plug to be inserted into the RS232 port at the rear of your machine. For others, it is the special disk normally inserted in the right hand floppy drive (or the single drive for a hard disk system). This disk key is the one originally supplied — a copy of it will not work as a key. Your Reference Card will tell you which type of key is needed with your system.

Setting the Date and Time The Manager controls access to various facilities of Moneywise. One of these is the Modeller which will be entered later in this lesson. Another facility allows Moneywise to use the correct date and time.

Although it is possible to start without setting the Date or Time in the computer, it is good practice to do so each time the computer is switched on. The clock records the date and time on every file at the moment it is saved. Printed reports also contain the date and time.

Press number key **2**. When the Date and Time screen appears, enter the date in the form set out on the screen. Press return.

Although time may be entered to the nearest second, setting the clock may be useful only to the nearest five minutes or

half hour. Enter to the desired accuracy in the form set out on the screen. Press return.

Calling the Modeller

Press number key **1** to call the Modeller.

After a few moments the Modeller service screen should appear (see fig. 2). The main service available at this stage is the one to open a moneybook.

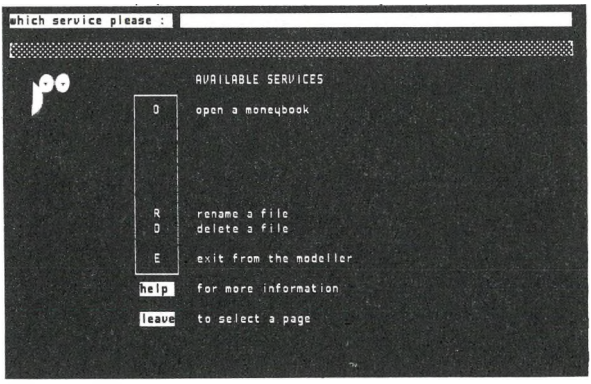


Fig. 2 The modeller service screen

If the computer beeps and a message appears on the screen the Moneywise key is not inserted correctly. Although Moneywise runs without the key, the amount of useful work that can be stored is restricted. For the purposes of this section the key can be ignored.

Inserting the Tutorial Disk

As part of the installation procedure, a working copy of the Tutorial disk should have been taken from the Tutorial Disk supplied. The Tutorial Disk stores the moneybooks to be used throughout the tutorial; the disk is ready to save any work the user wants to keep for subsequent reference.

Remove the Start-up L.H. Disk from the disk drive; replace it in its sleeve.

Insert the Tutorial disk in the left hand disk drive and close the door.

Opening a moneybook

To open a moneybook:

Type: the letter O followed by return.

The screen changes to ask for the name of a moneybook (see fig. 3).

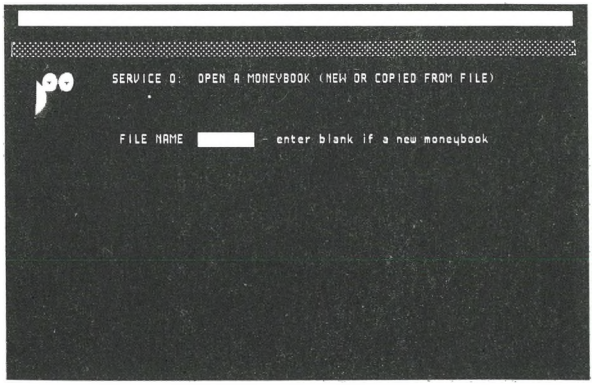


Fig. 3 Asking for name of moneybook

Type OVERVIEW return

After a few moments the screen will fill with the title screen of the moneybook. Remove the Tutorial disk from the left-hand drive, re-insert the Left hand Start up disk and close the drive door.

This particular moneybook models the financial performance of a company.

Moneybook title Notice that the moneybook has a title, as well as a file name. This allows us to keep several versions of the same moneybook, with variations between them. But each may be filed on the disk under a unique reference given by the filename.

Moneybook notes The 'notes' section allows for a more detailed explanation of the contents of the moneybook, if required.

Now let us move on to look at other pages of this moneybook.

Contents page

First of all, let us look at the CONTENTS page. The leave key allows us to leave one page and look at another. Press the leave key and in the top line of the screen you will see

page please :

If you inadvertently press it twice, press this key again until the message appears.

Enter C and press the return key.

You will see the screen change to display a list of the pages in use in this money book. They are

the Key page — summarising the modelling functions being performed

three modelling pages — containing the actual model as well as the resulting calculations.

three graph pages — showing graphical summaries of the calculations

a presentation page — showing a tabular presentation of the result of the analysis

The one type of page missing in this moneybook is a summary page — because this model does not require one. You will see it in use in Lesson 5.

Types of page

Every moneybook has a contents page, a key page and at least one modelling page. The number of modelling pages, graph pages, presentation pages or summary pages will vary according to the model's requirements. Other moneybooks would have a different number of each type of page.

Each page can be viewed on the screen or produced on the printer.

Presentation page

Let us look at each of the pages in turn. First of all press the key f5. After a few moments you will see the presentation page (called P01) appear on the screen. Study the information

shown. It is a forecast of performance for the first three months of 1984. Now press the key next page. The screen changes to show an empty page called P02. This is the next presentation page — currently empty, as are the remaining presentation pages in this moneybook.

Graph pages

Now press the key f4. After a few moments, the screen displays the information in the form of a bar chart. There are three bars for each month, with one bar having 'stacked' components. The graph page is called G03, one of many possible graph pages. To look at another graph page press key f3. This shows the analysis in the form of pie charts. The last graph page in this moneybook is given by pressing key f2. It shows a line graph, plotting the variables against a horizontal time axis.

Modelling pages

Presentation pages and graph pages are ways of showing the results of modelling. How is the analysis obtained in the first place ?

Press the leave key to select a page. Then enter **M1** and press the return key. The screen changes to the first modelling page MO1. You will see it is composed of six columns; some contain data, others contain formulae. Each column has a name - a,b,c,d,e,f and a title, related to the content of the column. The model is constructed by entering data or formulae into the columns of modelling pages. The calculations to be performed are straightforward. Compare the column titles with the data or formula beneath. Each formula refers to other columns by a column name - eg MO1a. Reassure yourself that the formulae are of the form you would expect.

Calculating

Now press key f1. The screen changes to show the results of the calculations. It is these values that are transferred for display in graph and presentation pages.

Sides of the page

Press key f1 again. The screen reverts to the 'working' page M01. It is though the page has two sides — the working side and the results side. The key f1 turns the page from one

side to the other. You will see later that each graph page and presentation page also has its working side.

Turning pages

Press the key next page. The modelling page M02 is displayed, a continuation of the model started on the previous page. Use key f1 to see the results side of the page. Use the key previous page to inspect page M01 again. Use the key next page to display page M02 and then use it again to view page M03.

Bookmarks

The keys f2 to f5 you have used are known as book-marks. Each of these keys can be set to point to the results side of a particular page. This facility becomes very useful when examining the effect of a change in the model. After making the change, you can go directly to view a graph or presentation page.

Key page

The only page in this moneybook we have not yet seen is the key page. Press the leave key to select a page. Then enter K and press the return key. The key page is displayed. It contains a list of all the columns in use in the moneybook. It is automatically updated when a modelling column is changed. Like the contents page, it has no results side; pressing the f1 key has no effect.

Moneyprints

Each of the pages in a moneybook can be printed; for the contents and key pages as you see them, for other pages their results side. One of the Modeller's services is available to do this. Press the leave key twice, until the message 'which service :' appears in the topline. Hold the help key down to see the list of services available. To produce a moneyprint (a selection of printed pages from a moneybook) use the P service.

Enter P and press the return key. The screen changes to present the moneyprint service screen. The page has been set up ready for use. Press the return key and move the spotlight down to the bottom of the screen.

Setting the printer type

If this is the first time Moneywise has been used, the printer type will need setting. With the spotlight on the cell next to 'printer type' hold the help key down. From the list of printers, select the numeric code for your printer. Release the help key and enter this number into the top line. Press the return key and the selected printer type is displayed.

Printing

Now press the return key when the spotlight is on the FILENAME cell. When the system asks if your printer is connected, check that it is and respond 'yes' in the top line. A moneyprint is produced when the return key is pressed.

Closing down

To exit from the Modeller and return to the Manager, press the leave key to select a service. Enter **E** followed by return. After a few moments the Manager screen will reappear. Use the numeric zero key to exit from the Manager. The disks may be removed and the computer switched off.

Conclusion

The purpose of this overview is to familiarise you with the structure of a moneybook. You have used the Manager's facilities, in particular to call the Modeller. A simple moneybook, demonstrating a simple business plan, was opened and the different types of pages viewed. A moneyprint was produced of a selection of pages. You are now in a position to start building this model from the beginning. Turn now to the next section and start Lesson 1.

TUTORIAL SECTION B

PRELIMINARY LESSONS 1 TO 4

CONTENTS **LESSON 1**

Introduction

This lesson introduces the basic operation of Moneywise. It shows:

- opening a new moneybook
- creating a simple model
- viewing results
- closing down.

Getting Started B 1.2

Switch the computer on and check that the Moneywise plug key is inserted, if supplied. Your Reference card describes the start up procedure and it is repeated here.

Insert:
- the Start-up Left hand disk in the left hand drive
- the Start-up Right hand disk in the right hand drive.

If you do not have these two disks, please refer to your Installation Card which will advise you how to create them.

The Reference Card also helps if you are uncertain about the keyboard layout.

After a few moments the Manager's screen should appear.

Calling the Modeller B 1.3

Press number key **1** to call the Modeller.

After a few moments the Modeller service screen should appear. The main service available at this stage is the one to open a moneybook.

If the computer beeps and a message appears on the screen the Moneywise key is not inserted correctly. Although Moneywise runs without the key, the amount of useful work that can be stored is restricted. To avoid this restriction, the key must be in place at the beginning of the session. (Press **E** to end the session, insert the key correctly and use number key **1** to start again. Continue from the top of this section).

Inserting the Tutorial Disk B 1.3.1

As part of the installation procedure, a working copy of the Tutorial disk should have been taken from the Tutorial Disk.

Remove the Start-up L.H. Disk from the disk drive; replace it in its sleeve.

Insert the Tutorial disk into the left hand disk drive and close the door.

The Tutorial Disk stores the Moneybooks to be used throughout the tutorial; the disk is ready to save any work the user wants to keep for subsequent reference. The files already on the disk will be used later in the tutorial.

Opening a New Moneybook B 1.4

To open a new moneybook:
Type: the letter O
followed by return.

Letters may be typed in upper or lower case. To type a capital hold the shift key down whilst pressing the letter key. To type all in capitals press the shift lock key once (if available on your keyboard). To unlock the shift, press the shift lock again.

The Spotlight B 1.5

A 'cell' is a space on the screen which requires data. The cell next to FILE NAME is illuminated more brightly than the others. This extra illumination is called the Spotlight. As the lesson progresses the spotlight moves, directing attention to different cells.

To open a *new* moneybook the cell for the file name should be left blank :

Press: return

A file name is not entered here because a new moneybook is being started. Moneybooks are given file names when they are saved as files. The appropriate name would be entered here if a previously saved Moneybook were required.

The screen now demands more details :

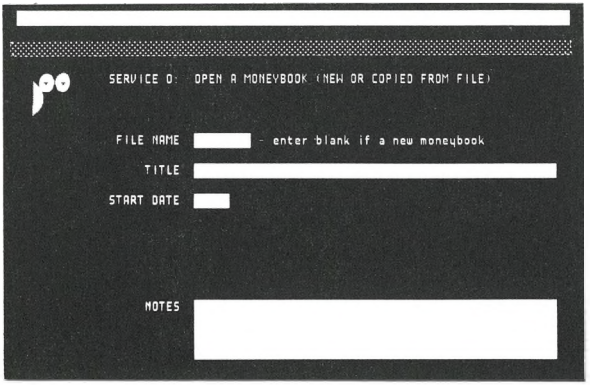


Fig. 4 Asking for a title

Entering a Title The spotlight now illuminates the cell next to TITLE. **B 1.6**

Type: **TUTORIAL — LESSON 1**
(or other suitable title).

This title appears on the top line of the screen.

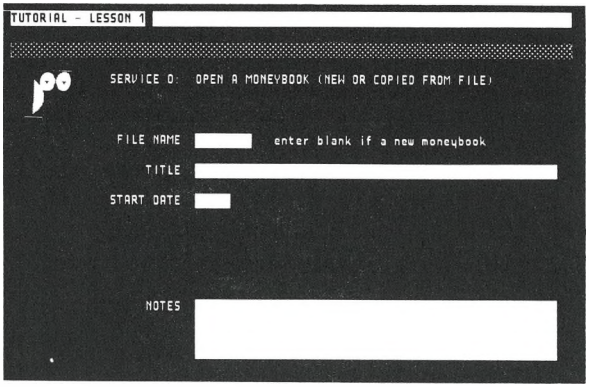


Fig. 5 The top line with title

Upper or lower case letters, digits and other punctuation may be used in a title, but avoid ? and / and " which have special uses. Use left and right to move the cursor over characters typed by mistake and overtype with the correct character. There is more about how to correct mistakes in Lesson 2.

Now press return. The TITLE in the top line is now placed in

the spotlit cell. The spotlight then moves to the cell labelled START DATE.

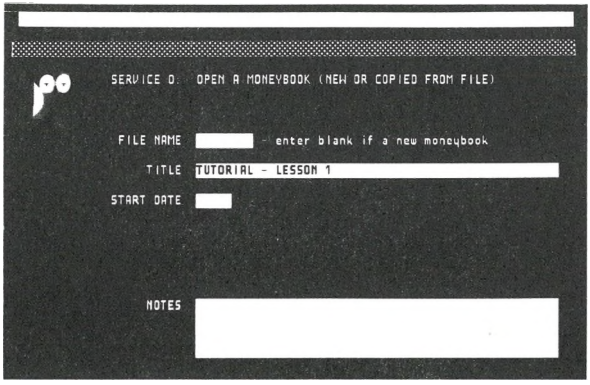


Fig.6 Spotlight asking for start date

Typing Errors B 1.7

Before continuing the moneybook, we demonstrate the effect of a deliberate mistake to show that typing errors are not a problem. Type something silly. For example:

Type: **qwertyuiop** (the top row of letters)

Each letter, as typed, appears under the cursor in the top line. Press return, and the alarm beeps. An error message appears for a moment in the top line. The top line then reverts to the original entry.

Press return again. The same thing happens.

Press return followed by help. Hold help key down. The screen then shows a detailed explanation of the error.

Releasing help makes the screen revert to its original content.

To get rid of the nonsense word press delete line

Entering the Start Date B 1.8

The spotlight is now at the cell labelled START DATE.

Press help and hold it down. The screen displays the format of the values that can be entered.

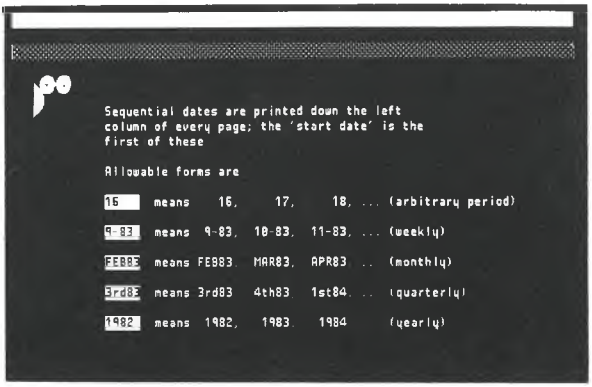


Fig. 7 Help for start date

Now release help and watch the screen revert. Pressing help again makes the screen reappear; try it. Now to proceed:

We will use monthly intervals and start a model from the beginning of 1984.

Type: **JAN84** followed by return.

The spotlight now moves to the NOTES cell.

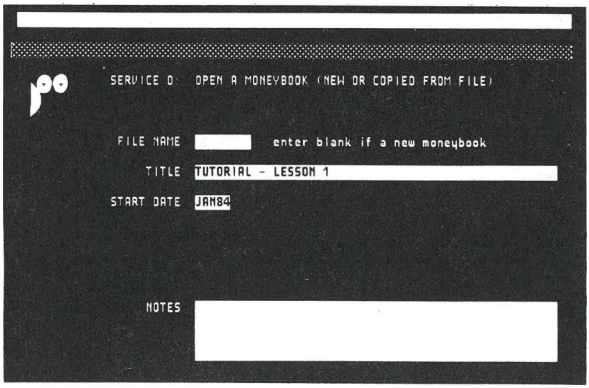


Fig. 8 Showing the notes cell

NOTES may be entered in a similar manner to the title above, but are not obligatory. Leave them out for the time being.

Selecting a Page Having opened the moneybook the individual pages may be seen. Typically the first page displayed is a modelling page.

Press: leave

The top line shows:

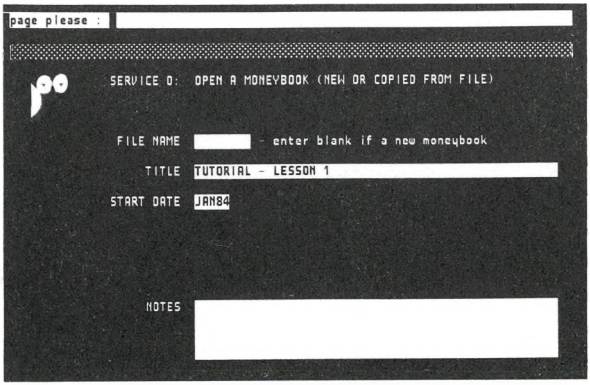


Fig. 9 Page please

Press help to see the options available, then release. The page selection now offers further options.

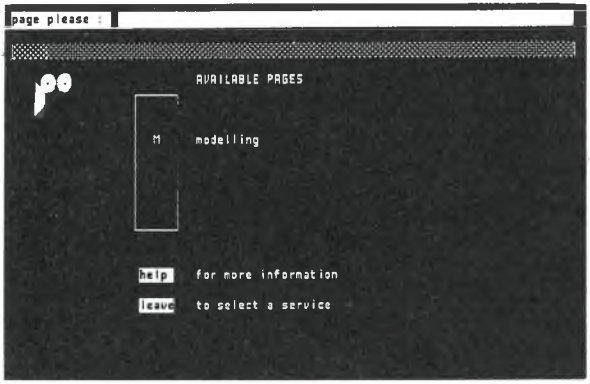


Fig. 10 Available pages

The screen shows what letter to type for each page.

Press: M followed by return

The first modelling page, M01, is displayed.

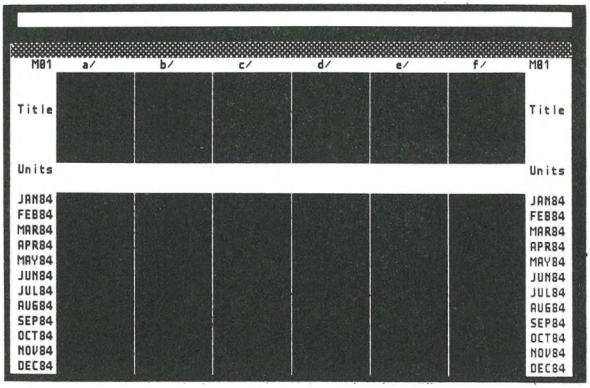


Fig. 11 Modelling page

Modelling page layout B 1.10

The page is composed of six columns, designated a to f. Each column represents a component of the model such as PROFIT or COSTS. The model itself is constructed in terms of columns.

Display of numbers B 1.11

The spotlight on the modelling page illuminates the top of column a. Press help. The help screen explains that a display factor is needed. All numbers in this column would subsequently be displayed as a multiple of this factor. The factor affects only the display in the column; not the accuracy of calculations.

Type: 1 return

The cell labelled TITLE is now spotlit.

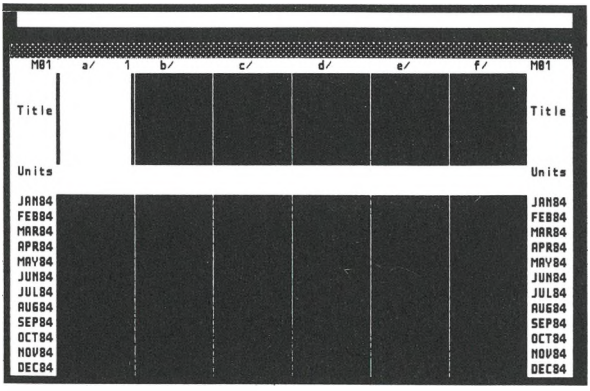


Fig. 12 Asking for a title

Enter a title, for example the single word **VOLUME**. Press help if uncertain what to do.

The spotlight then moves to the cell called UNITS.

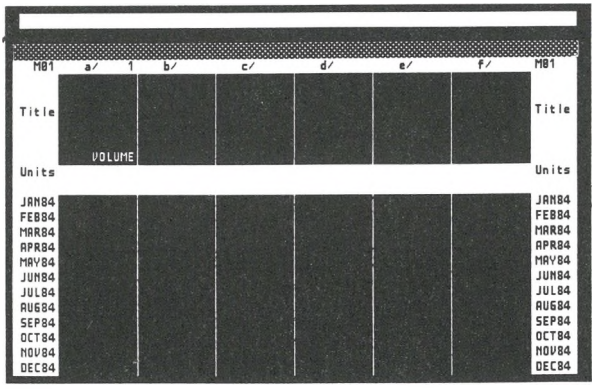


Fig. 13 Asking for type of units

The UNITS text can be used for anything but is most usually used to describe the units of measure of values in the column. Try help for further explanation. For example enter **TONNES** followed by return.

Entering data The spotlight now moves to the cell opposite JAN84. Recall that the starting date was given as JAN84. Note that the column itself is still empty. To give values just type numbers, each followed by return. The keyboard may have a numeric pad to the right of the alphabet for speedy input of numbers. This may be used in preference to the number keys arranged above the alphabet. **B 1.12**

The Modeller has facilities to generate numbers when those numbers form a pattern. For example, the numbers 100 to 200 spread evenly over 10 periods may be said to have a pattern.

Type : **100** return

Notice that as soon as the first value has been entered the remainder of the cells are set to dashes and the spotlight moves automatically to the next cell. The dashes are there as a reminder to enter data in this column. By moving the spotlight to the next cell the program encourages one to do so.

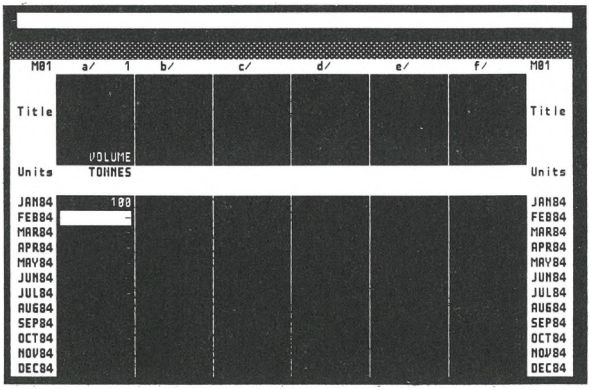


Fig. 14 Entering data on a modelling page

Moving the spotlight B 1.12.1

When creating a moneybook the spotlight moves automatically. However, there are occasions when the spotlight has to be moved.

There are four keys labelled →, ↓, ↑ and ←. On most keyboards they are near or on the numeric pad. See the Reference Card if in doubt. These keys are for moving the spotlight in the direction given by the arrow. Try it and see. Notice that when the spotlight gets to the top or left hand edge of the modelling page repeatedly pressing the key has no effect. When the spotlight moves to the right into an empty column it goes straight to the top of the column.

Once automatic movement of the spotlight is interrupted by the use of these keys the spotlight has to be controlled until the Modeller can again anticipate how the spotlight should move. The contents of the spotlit cell are always displayed in the top line. This allows the value in the cell to be changed at will.

Scrolling B 1.12.2

After twelve lines have been entered the JAN84 line disappears, to be replaced by FEB84. The JAN84 line is hidden as though it had slid under the bottom edge of the UNITS line. The edge then appears jagged so as to emphasize that it is no longer the top edge.

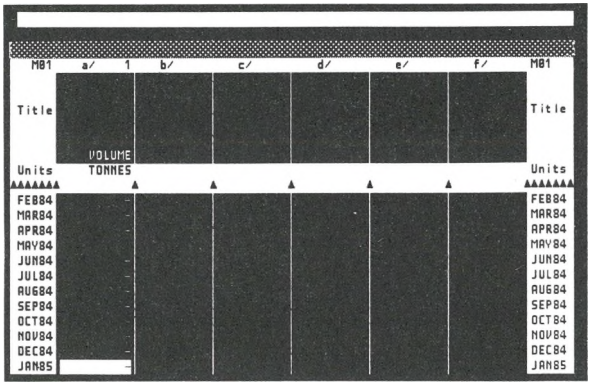


Fig. 15 Scrolling the screen

Repeated use of the ↑, to the top of the column, re-displays the JAN84 value. The jagged edge disappears.

Data generation Move the spotlight underneath the 100 just inserted. The aim is to demonstrate generation of data by steps : **B 1.12.3**

Type: **ST**

The top line fills with :

step in increments of_ _from item above spotlight

and the cursor can be seen in the gap.

Type : **5** return

and notice the spotlit cell now contains 105.

Move the spotlight downwards using the spotlight control key ↓, and notice the next cell fill with 110. Move the spotlight successively downwards; the cells fill with 115, 120 and so on. Continue until 130 appears. If the spotlight is made to go too far use ↑ to move it back. Then press return. Only then are the figures 'frozen' and generation stopped.

Now move the spotlight downwards on to the first blank cell. The spotlight should be next to AUG84. The aim is to demonstrate the compound growth generator.

Type : **GR**

and look at the top line. It contains:
grow from item above spotlight at_ _% (per intervals)

Enter: **-21.5** in the first gap.

Then press right to move the cursor to the next gap.

Type: **12** return.

These above numbers specify a decrease at 21.5% over 12 months.

Now move the spotlight downwards. As the spotlight moves, each cell is filled with a value. When the spotlight is at DEC84 press return to freeze the values.

There are other data generators that work in a similar way: INterpolate and REpeat. Move the spotlight to column M01b and try each of them. Use help if in doubt.

Move the spotlight to column b and give it a display factor :

Type: **.01** return

Give the column a title: **SELLING PRICE** return

For units use: **£0.00** return

If in doubt refer to B 1.11 to see how VOLUME was created.

Now move the spotlight down column b to the JAN84 line.

Type: **10** return

Now move the spotlight down to the FEB 84 line. The idea is to generate this value automatically as far as JUN84.

Type: **RE**

which expands to:

repeat the block of_ _(no) items above spotlight

Type: **1** return

Now move the spotlight down to JUN84 and then press return. Notice that the simple value of 10 has been duplicated from JAN84 to JUN84.

Now repeat the above for JUL84 to DEC84, but use a value of 12.50.

Entering a formula

Move the spotlight to the top of column c and set the display factor to **1**. Set title and units to **TURNOVER** and **£0.00** respectively. TURNOVER is equal to the multiplication of VOLUME and SELLING PRICE, so enter a 'formula' for multiplication : **1.13**

Type: **=MU**

as soon as the equals sign and the first two letters of the word 'multiply' are typed, the top line becomes :

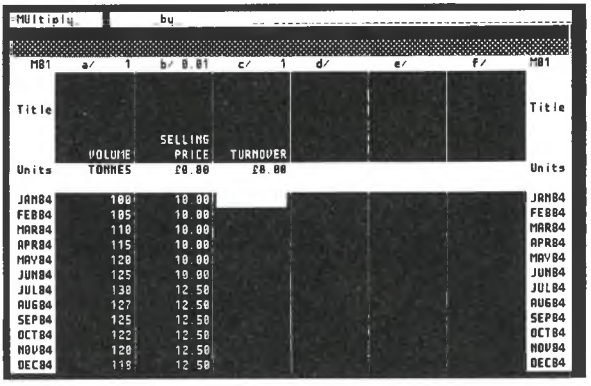


Fig. 16 Top line showing a formula

The cursor is placed in the gap after the word 'multiply'.

Type: **M01a** (do NOT press return)

and then press right to move the cursor to the next gap. (Typing the 0 between M and 1a is not obligatory. Entering M1a produces the same result as M01a. This is true for all page numbers in the range 1 to 9.)

Type: **M01b** return

The modelling column becomes:

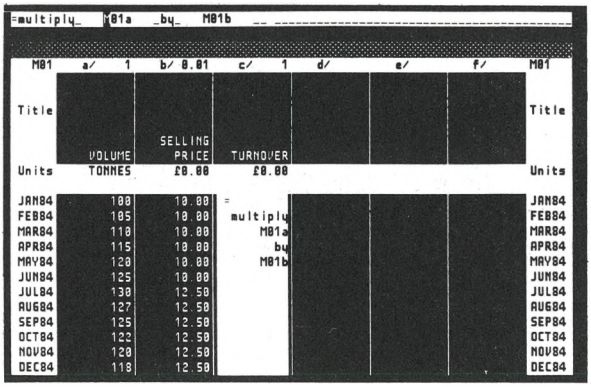


Fig.17 A formula entered in a modelling column

Turning to the results

Now press f 1. The display changes to give the results of the modelling so far. **B 1.14**

Pressing f 1 again makes the screen revert to the working side. It is like looking at different sides of the same page. One side shows the modelling formulae; the other shows the results of applying these formulae. It is possible to turn from one side to the other by pressing f 1.

Changing data

Now move the spotlight to column b. When moving the cursor down the column it is possible to change any value. Use right and delete to change the top line; then press return. If f 1 is now pressed, column c is displayed with its new values. (Notice the speed at which it has been recalculated.) **B 1.15**

The leave key

Now press leave. The top line asks for a page to be selected. Press help to see the selection of pages now available. **B 1.16**

Type: C return

to see the list of contents which records all pages so far begun.

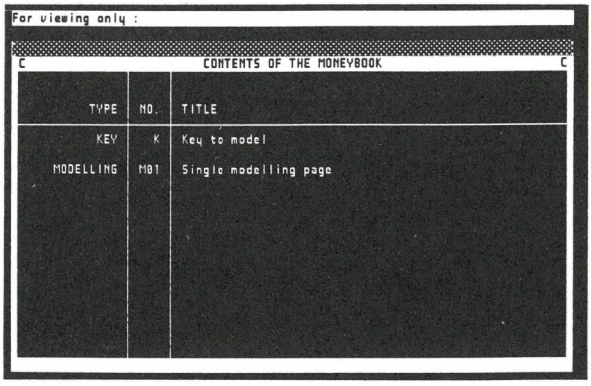


Fig. 18 The Contents page

or press leave again, and

Type: K return
to see the key page. The key page defines the use of every column in the model.

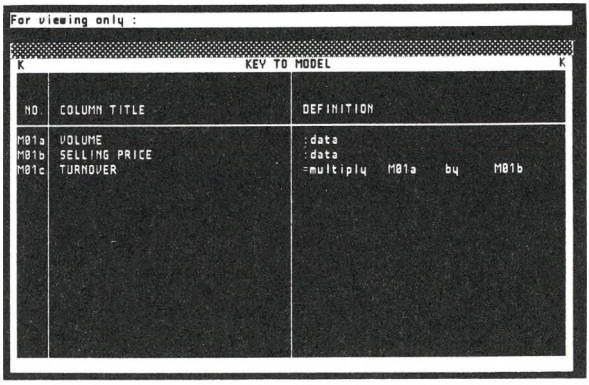


Fig. 19 The Key page

The leave facility allows rapid movement between pages of the moneybook and among the service screens. The moneybook may have other pages besides modelling pages. There may be graph pages, presentation pages and summary pages. These are explained in later lessons. Selecting another page, or choosing a service, automatically closes the current page until it is selected again. When a page is selected it sets the spotlight at the next available column.

To confirm this press leave to make the top line ask for a page.

Type: M01 return

The spotlight should be on the first available column.

Now press leave twice. The screen then invites the choice of a service. Press help to see the services on offer.

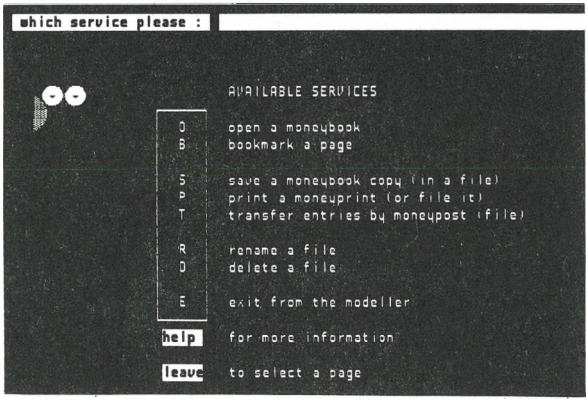


Fig. 20 Available Services

Closing down Type: S return **B 1.17**

The 'S' service for saving or storing moneybooks is then automatically called. The screen displays the information given when opening this moneybook. Any of the cells may be amended at this stage. For example, some appropriate notes could be entered.

Move the spotlight to one of the lines for NOTES. Now type an appropriate note followed by return.

In order to save the moneybook on the disk it must be given a name by which to retrieve it later. It is useful to devise a name that has some significance. If colleagues use the disks it may be helpful to include one's initials in the file name. Up to eight letters or digits are allowed in a file name. For example OWNTEST1. Note that intervening spaces are not allowed.

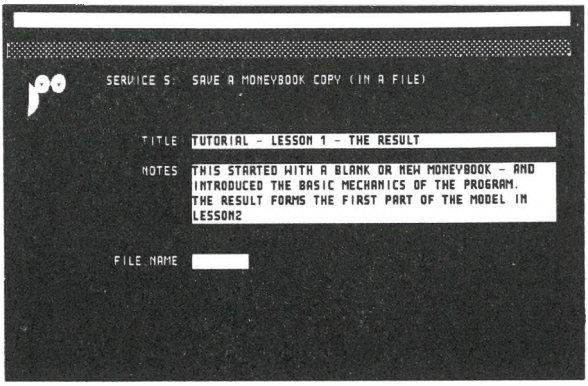


Fig 21 Ready to close down

The spotlight is moved to the cell labelled FILE NAME. Having entered the file name in the top line press return. The Modeller attempts to save the moneybook under this name. If the chosen name is a new name on the disk the screen says so.

The screen then displays a new cell with the label?

O.K. TO FILE ?
A reply of Y (for yes) followed by return then causes a copy to be stored for later reference.

If the Modeller responds that a file with this name already exists, change the file name and try again.

The amount of time it takes for the Modeller to file depends on the size of the moneybook. After saving, the top line asks for a page. Press leave and help if a service screen is wanted rather than a page.

Removing the Tutorial Disk

Before closing the Modeller the Tutorial disk must first be removed and placed in its sleeve, and the Start-up L.H. Disk placed in the left hand disk drive.

B 1.17.1

Type E return (to specify Exit)

The Manager's screen, shown at the beginning of this session, appears.

To leave the Manager: press number key **0**

When the computer signals it has finished, by showing 'A>', remove both disks and replace them in their sleeves. Remove the Moneywise plug key if supplied and keep it safe.

Switch off the machine and close both drive doors.

Conclusion

This is the end of LESSON 1. It covers many of the basic concepts of Moneywise. These are listed below, with references to the User Manual.

Opening the Manager and Modeller	2.1,2.3
The Modeller screen	3.1
– top line	3.3
– cursor	3.3
– spotlight	3.2
– gap	3.3
The Help facility	
– pressing help	3.1
– to explain error messages	3.4
Moving the spotlight → , ↓ , ↑ and ←	3.2
Amending (editing) the top line using left right delete line	3.5
Using leave to move between pages and services.	3.8
Creating a simple model	
Data generation	6.4
Displaying	
– contents page	5.1
– key page	5.2
– numbers in a column	6.1
Modelling pages	
– entering data	6.3
– simple modelling formula	7
– using f 1 to display results	3.8
– amending a model and data	12.1
Saving a moneybook on disk	4.4
Using a separate disk (in this case the Tutorial Disk) for storing Moneybooks	4.4

If you wish to compare your work with ours, open the moneybook RESULT1 and examine it. Lesson 2 starts with the result of Lesson 1 and builds on it. It explains how to amend the content of cells and demonstrates some more formulae.

CONTENTS	LESSON 2

Introduction

B 2.1

In this lesson, the simple model built in Lesson 1 is developed into a straightforward Profit and Loss model. The lesson demonstrates the facilities for editing the contents of a cell and introduces more formulae.

Opening an Existing Moneybook

B 2.2

Start Moneywise, call up the Modeller and insert the Working copy of the Tutorial disk. The procedure is covered in Lesson 1. When the spotlight is on the cell labelled FILE NAME:

Type: LESSON2 return

Notice the first page of this moneybook is :

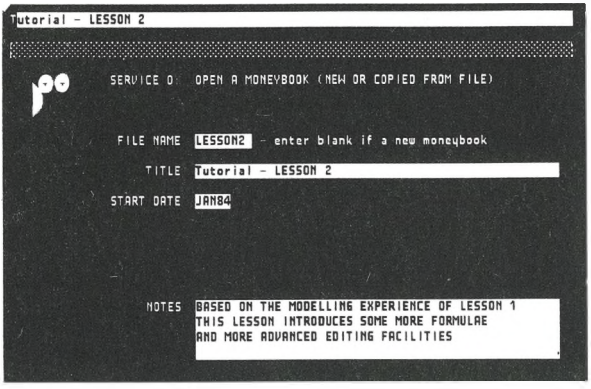


Fig. 22 Opening an existing moneybook

Editing a Cell

B 2.3

Changes are made to some of the details so as to illustrate the editing facilities.

Move the spotlight to one of the lines of notes using ↑ and ↓. As the spotlight moves the contents of each cell are displayed in turn on the top line. The contents can be changed by altering the top line and pressing return.

Move the spotlight to the third line of notes. Place the cursor in the space after the word 'more'. The object is to change 'and more advanced editing facilities' to 'and more editing facilities in Moneywise'.

Deletion B 2.3.1

A complete line may be deleted using delete line as already demonstrated.

Press delete rest

This removes all the characters to the right of the cursor on the top line. Then:

Type: space FACILITIES IN MONEYWISE return

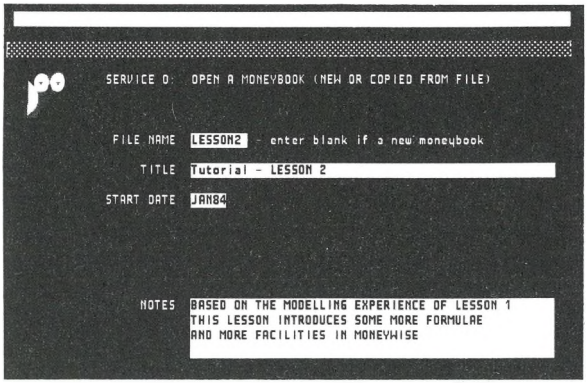


Fig. 22 Editing the top line (after return)

Insertion B 2.3.2

Move the spotlight back to the third line of notes and place the cursor in the space after the word 'more' once again. Press insert and notice the letter 'I' appear at the end of the top line.

The third line will be made to include the word EDITING.

Type: space EDITING

The letters typed are inserted at the cursor, moving the 'F' and following text to the right. Now press insert again and check that the 'I' at the end of the line disappears. Any letters now typed overwrite the top line at the cursor position.

Now press return

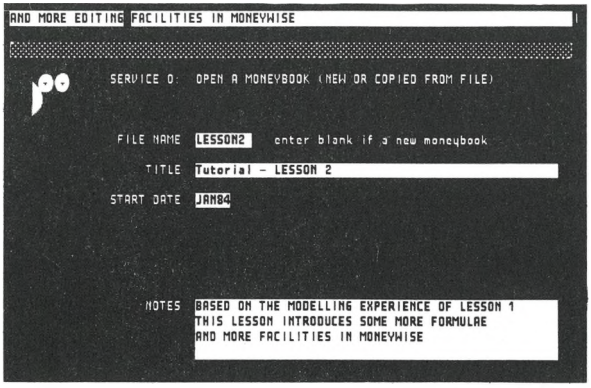


Fig. 24 Inserting into the top line (before return)

Treat delete rest and delete line with care. Once they have been pressed the simplest way to cancel their effect is to move the spotlight to an adjacent cell and back again without pressing return. Now explore the use of the editing keys. They are useful not only for updating the moneybook but also for correcting typing errors. To display the contents of an open Moneybook:

Press: leave to select the page, and
then
Type: **C** return

The contents page shows that M01 to M03 are in use.

So turn to the first modelling page:

Press: leave to select the page

Type: **M1** return

Notice that the page now displayed starts with the result of Lesson 1 and that some additional columns have been entered in preparation for this lesson.

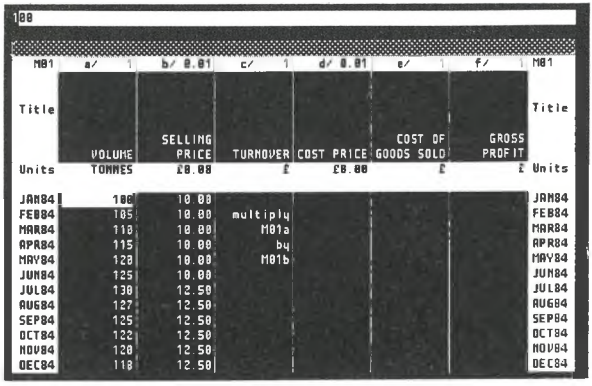


Fig. 25 Modelling page for Lesson 2

Some Formulae for Calculation The formulae =ADD, =SUBTRACT and =DIVIDE should be self explanatory; =MULTIPLY was illustrated in Lesson 1. **B 2.4**

Value formula Move to column M01d to try out another formula. **B 2.4.1**

Type: =VA 5 return

Notice the skeleton of the formula appear. Check the results by pressing f 1. A warning appears in columns e and f drawing attention to the fact that these two columns are not yet defined as either data or formulae.

Now take over and try some model building.

It is required to calculate COST OF GOODS SOLD as the product of VOLUME and COST PRICE, where the capital letters denote columns of the model. It is also required to calculate GROSS PROFIT as the difference of TURNOVER and COST OF GOODS SOLD.

Go ahead and enter the formulae needed. Look at the results side of the page by pressing f 1 to see if you agree with the results provided.

Multiply formula with %

Move on to page M02 by pressing next page. If the results side of M01 is on display it is also necessary to press f 1 to return to the working side of M02. Notice that all the columns have been set up. Some data has also been entered for M02a and M02b. Formulae have been entered for M02c, d, and e. Note how these formulae are used. Move the spotlight to examine them.

B 2.4.2

Column M02f is still not in use. Using the example shown for M02e enter the formula for M02f to calculate percentage net profit as the column headed NET PROFIT divided by TURNOVER, but with results all multiplied by 100.

Notice the way M02e is defined with % appearing after M01c in the formula. This produces the answer as a percentage. Check the formula by pressing f 1 and looking at the results side.

Shift formula

Go on to M03 by pressing next page to look at some more arithmetic formulae. Notice, as before, that more column titles have been defined and a formula has been entered for column M03a. Before looking at the formula decide what it is that the column represents. Assume that the CASH RECEIVED FROM CUSTOMERS would be delayed by a certain period beyond the date of actual sale. In this example the delay is indeed 3 months. Hence M01c, TURNOVER, is shifted by 3 time periods.

B 2.4.3

Over to you again. Define formulae for M03b and c as follows using M03a as the example :

PAYMENTS TO SUPPLIERS — delayed by 2 months
PAYMENTS FOR RUNNING COSTS — delayed by 1 month

Use help as necessary.

Total formula

Move on to column M03d headed MONTHLY CASH FLOW. The formula for this should express that MONTHLY CASH FLOW is to be CASH RECEIVED FROM CUSTOMERS less PAYMENT TO SUPPLIERS less PAYMENTS FOR RUNNING COSTS.

B 2.4.4

The Total formula is used for totalling more than two columns. Columns can be negated before totalling by preceding the column numbers by a minus sign. For example -M01a means M01a with the signs of all its entries reversed.

Type: =TO Now press help to see what is to be entered in the gaps.

The columns involved are M03a, M03b, and M03c. Over to you. M03b and M03c should be preceded by minus signs. When the gaps are filled in press return.

Check the formula by pressing f 1. Look at any of the formulae on this page by moving the spotlight and pressing help.

Compound formula

In column M03e the CUMULATIVE CASH FLOW for the year (on a monthly basis) should be entered, so as to see the cash position at the end of each month. **B 2.4.5**

Move the spotlight to M03e column.

Type: =CO

which then expands to :

=compound_ _with_ _at_ _% _____
Now press help to see a full description of the formula. In its simplest form the formula is used for accumulating values down a column. Press right to position the cursor at the second gap.

Type: M03d return

Gaps 1 and 3 are left empty here. They are discussed in Lesson 8.

Display of Numbers

Before leaving the modelling page move the spotlight to the cell at the very top of column b. Change the display factor to 0.005 and turn to the results. Press help to see what other values could be used for the display factor. **B 2.5**

Notice that a change in the display factor does not cause a change in modelling columns that use column b. The Modeller always calculates to full accuracy but displays results as a multiple of the display factor specified for each column.

Closing Down

Results may be saved by following the procedure demonstrated in Lesson 1. Do this on the Tutorial disk, then replace the Tutorial disk with the L.H. Disk in preparation for closing down.

Now call this lesson to a close. As in Lesson 1 press leave twice to choose a service, and

Type: **E** return

and follow the procedure for closing down shown in Lesson 1.

Conclusion

This lesson covered :

Editing the top line using: left and right	3.5
delete and insert	3.5
delete line and delete rest	3.5
Calculation formulae	7.5

=add
=compound
=divide
=multiply
=shift
=subtract
=total
=value

The more complex uses of compound are explained in Lesson 9. Finally your results in Lesson 2 can be compared with the moneybook RESULT2. Lesson 3 expands on this lesson, covering a powerful method for simplifying the building of large models — Moneysearch — and the management of columns and pages. It explains how to generate graph pages to give bar charts, pie charts and line graphs.

CONTENTS **LESSON 3**

LESSON 3

B 3

Introduction

B 3.1

This lesson introduces Moneysearch, an important aid to handling larger models. Up to 67 modelling pages are available, and other types of page as well. It could be easy to lose track of what variables are in use. Moneysearch is useful for moving quickly around modelling pages and searching through modelling columns. The effect of changing formulae and examining results has been demonstrated. But a clearer demonstration of a change in the model is given by a graph. This lesson introduces the various types of graph.

Moneysearch

B 3.2

OPEN Moneybook — **LESSON3** Remember to insert the Tutorial disk after calling up the Modeller.

Turn to M01

Type: **"COST"** (Note particularly the quotation marks — the key to the search facility.)

The Search line

B 3.2.1

The spotlight goes first to the top line; the result appears in the second line of the screen. The second line is called the search line. All column titles are searched for those titles that contain the word 'COST'. The screen shows that there are 6 'matches'. The first of them is displayed in the search line (M01d COST PRICE). Notice the word COST underlined. On pressing next match the second match is displayed (M01e COST OF GOODS SOLD). The search line shows the column number followed by the column title. Use next match to step through all titles that match the text sought. Similarly use previous match to step back. The facility is not for turning pages, it just says where they can be found.

Continue pressing next match after the last match has been found. The next available column is marked 'PENDING'. This facility is demonstrated below.

In its search the Modeller is looking for the specific sequence of letters. For this purpose there is no difference between words containing capitals and lower case letters.

Type: " C F " with spacing as shown. Examine carefully the resulting matches. Titles containing any words with 'C' followed by the same or another word with 'F' are displayed.

Experiment with it. Try it with a fragment of a word. It is instructive to see not only those titles that are selected, but to register those that are not. What happens with " " ? What is available in the search line then ?

Finding a column title **B 3.2.2**

Now type: " M1b " The search line displays the title of column M01b. There is only one match because column numbers are unique.

It is important to remember that the search facility is available whatever else is being done in the moneybook. The latest fragment of text remains in the search line until another text is sought.

Advance Booking of a Column **B 3.2.3**

Whilst constructing the model there may be a need for a modelling column that has yet to be defined. The advance booking of a column allows the current calculation of a formula to be completed. It leaves a reminder to define the reserved column later .

Type: "TOTAL PAYMENTS"

The search line displays :

No matches: PENDING *M03f "TOTAL PAYMENTS"

The column is described as pending because no column title contains the quoted words. Now press insert match but do not press return . Column M03f is now reserved for use later; it is given the title TOTAL PAYMENTS. Turn to page M03 and check.

The column which referred to M03f cannot be calculated until M03f contains either data or a formula. Note also that the display factor must be defined, and units inserted, before column M03f is ready for use.

Determining where a column is used

B 3.2.4

It is easy to find in which formulae a particular column is referred to :

Type: " M1c "

As before, this procedure yields the title of column M01c. Now press next use. A formula involving M01c then appears in the search line. Repeated depression of next use reveals all the uses of M01c in turn, including the definition of M01c itself. previous use permits stepping back through the list.

It is possible to combine the kinds of search first illustrated. Determine where " COST " is held, step through using next match to find column M01e. Then press next use to examine which columns use M01e in their calculations. Stop for a moment and think how to apply this technique. If costs were to change, for example, what else would be affected? This suggests a search on the columns for costs.

Inserting in the top line

B 3.2.5

The Modeller allows searching for a column by its title: then inserting its column number into a gap in a calculation formula.

Move the spotlight to the top of column M03f and set the display factor :

Type: 1 return

Position the spotlight to enter a formula.

Type: =AD

The formula appears in the top line with gaps for items of data.

Now search for " PAYMENT " and step through using next match until the search line shows :

3 matches: No.1 M03b "PAYMENTS TO SUPPLIERS"

The 'M03b' is spotlit. Press insert match and watch M03b appear in the top line. Press next match again and see M03c appear in the search line. Press insert match and M03c will

appear in the next gap in the top line. Now press return and the formula will appear in column M03f. Press f 1 to be reassured that the outcome on the results side is correct.

Organising column titles

B 3.2.6

With some care in choosing titles for modelling columns the search facility becomes a useful tool for developing the model. Because a title can be revised, it is possible to concentrate on helpful names (for example: Dept.A: Stationery Overhead) so that the column could be referred to using the search facility. In the above example a search could be made on Dept.A or Stationery or Overhead or any two fragments in combination.

Deactivating a Column

B 3.3

The system does not allow a column containing data to be given a formula, nor does it allow a column containing a formula to be given data. This is to prevent columns being overwritten by incorrect positioning of the spotlight.

Turn to page M06. Move the spotlight to the formula in column M06b

Press delete line to clear the top line.

Type: =DE return to deactivate and empty the column.

Move the spotlight to M06a

Press delete line to clear the top line.

Type: DE return to deactivate and empty the column.

It is now possible to use either column for data or a formula.

Exterminating a Column

B 3.4

An entire page or a modelling column may be exterminated. However, it is impossible to to exterminate a modelling column that is referred to from another modelling column. An error message is displayed in such cases.

Press leave to select a page

Type: X M06c return

Do not forget the space following the 'X' in the top line.

The program asks whether the column is to be exterminated. The screen shows an ominous cross over the column to be exterminated. Respond Yes or No followed by return.

Type: Y return

Exterminating a Page Press leave to select a page **B 3.5**

Type: X m6 return

Again it is obvious which page is referred to.

Type: Y return as before.

Types of Graph The Modeller has facilities for creating line graphs, bar graphs and pie charts in various layouts. **B 3.6**

Graph Page layout Graphs are drawn on pages G01, G02 and so on. A modelling page has two sides; a working side and a results side. Each graph page has a similar structure. On one side of the page the type of graph is specified; on the other side the result can be seen. Once the graph type has been specified, the screen unfolds with cells to be filled in with data relevant to that type. This is explained by example below. Once graph pages have been prepared, they can be reproduced in the moneyprint. Moneyprint is discussed in Lesson 4. **B 3.6.1**

A graph may be prepared for a modelling column whether there is data in the column or not. Used in conjunction with a bookmark (to turn frequently between the data and the graph) the effect of the data can be seen pictorially. The use of bookmarks is explained in Lesson 4.

Line graphs Line graphs are used for displaying up to three columns of data across a time span. A line graph is prepared as follows : **B 3.6.2**

Press leave if necessary to select a page and then:

Type: G return

This causes graph page G01 to appear on the screen.

The spotlight is at the top pointing to the title line for the graph. Type a title in the top line of the screen:

Type: NET PROFIT vs MONTHLY CASH FLOW return

The spotlight moves down to the cell labelled TYPE. Press help to see the types available. To draw a line graph :

Type: LINE return. Typing only L will have the same result.

The form to be filled in for line graphs now unfolds and the spotlight moves to the cell labelled DATES. Enter the first date:

Type: JAN84 return

Move the spotlight to the adjacent cell to define the date at the end of the required time span :

Type: DEC84 return

The graph is to show NET PROFIT and MONTHLY CASH FLOW. Use moneysearch to find the column number for NET PROFIT and use the Insert facility to put the column number (via the top line) into one of the cells labelled COLUMN NUMBER. Move the spotlight to the first such cell if it is not already there and enter the column number. Move the spotlight to the next cell and use the search facility again for entering the column number for MONTHLY CASH FLOW. There should now be column numbers in two of the cells – M02d and M03d. Now press f1 to see the result. Experiment with the options to see the effect. Try the grid lines.

Pie charts B 3.6.3

Pie charts are used for representing proportions or percentages diagrammatically. A pie is drawn as a segmented circle. Each pie shows results at a specific time interval. There is a choice of displaying one or two pies per page.

Press next page to go to G02 (working side). There is a blank graph page with the spotlight on the title line.

Type: **PROFITABILITY** return for the title

Type: **P** return for the choice of a pie

The aim is to compare the relative proportions of NET PROFIT, OVERHEADS, SELLING COSTS, COST OF GOODS, TURNOVER.

To see how these proportions change, draw two pies – one for JAN84 and another for DEC84.

Again enter **JAN84** and **DEC84** in the cells for dates as described before.

Use moneysearch to find column numbers for :

TURNOVER
COST OF GOODS SOLD
SELLING COSTS
OVERHEADS
NET PROFIT

Insert the numbers in the first five cells labelled column number. Different shading is used in the pie charts for each column number selected.

Before pressing f1 to see the result check that the five cells hold the following numbers :

M01c, M01e, M02a, M02b, M02d

After seeing the result on the results side try altering dates in the date cells. The sizes of segments and the percentages change according to the dates used.

Bar graphs

Bar graphs (histograms) are another way of representing or comparing results across a stated time span. A bar graph would be used for comparing individual periods within the time span.

B 3.6.4

Try producing a bar chart using the same columns as for the pie chart.

Proceed as follows :

– Use next page to go to the next graph page (working side). It should be G03.

– Enter the title as **HISTOGRAM OF BUSINESS**

– Enter the graph type as **B** for BAR

– Enter the dates as **JAN84, DEC84**

– Put the column numbers for TURNOVER, COST OF GOODS SOLD, SELLING COSTS, OVERHEADS and NET PROFIT into the cells for column numbers.

Bars are produced side by side or stacked. This implies that each bar may be made up of values from more than one modelling column. Because turnover is to be compared with costs and net profit, put TURNOVER in one bar and put COSTS in another. Put NET PROFIT in a third. To do this simply : in the cells labelled LATERAL ORDER :
Type: **1** under the cell containing M01c
2 under the cells containing costs M01e, M02a, M02b
3 under the cell containing M02d

Press f 1 to see the bar graph.

Experiment with LATERAL ORDER and STACKING LEVEL. The latter specifies the order of stacked bars when arranged vertically. The former determines the relative position of bars in each time interval from left to right. Those with the same number appear in the same stack.

UNIT BARS and GRID LINES may also be specified. See the effect of selecting them separately. Use help as necessary.

Conclusion

In this lesson the following subjects were introduced :

Moneysearch : a facility for managing models:

– Searching column titles	8.3
– Searching column numbers	8.2
– Where column numbers have been used in formulae	8.4
– How columns have been defined	8.5
– Advance booking of columns	8.6
– Inserting a column number into the top line	8.5

Graphs: 5.5

- Line graphs
- Pie charts
  - single and double
- Bar charts
  - stacking
  - bar numbers
  - levels
  - unit bars
- Grid lines

Managing the modelling columns:

– Deactivating a data column	6.2
– Deactivating a calculation formula	6.2
– Exterminating columns	12.1
– Exterminating pages	12.1

Finally your results in Lesson 3 can be compared with the moneybook RESULT3. In Lesson 4, we reach the stage demonstrated in the Overview at the beginning of this Tutorial. Bookmarks are introduced, enabling you to move quickly to another page to examine the results of a change in the model. Composition of presentation pages is explained, leading to the production of a moneyprint.

CONTENTS **LESSON 4**

LESSON 4

B 4

Introduction

B 4.1

So far the lessons have been about data generation and producing graphs. This lesson is about constructing reports defined according to need. Bookmarks are introduced and finally we introduce Moneyprint for printing parts of the Moneybook.

As before an existing moneybook called LESSON4 may be found on the Tutorial disk for working through this lesson.

OPEN Moneybook — **LESSON4**

Press **leave** to select a page

Type **C** **return**

This moneybook contains the cumulative experience of the previous three lessons. In addition the contents page shows a new page — P01. This is a presentation page.

Presentation pages

B 4.1.1

A presentation page is used for constructing reports by drawing them at the keyboard. The construction of reports is a matter of filling in cells on the screen. The screen can be thought of as a window on to a sheet of paper. Just as for modelling pages and graph pages each presentation page has a working side and a results side.

Each cell is cross-referenced by a row number down the side and a column number across the top. Thus the cell in the top left hand corner is 1.1 and the bottom right hand corner is 71.28, where there are 71 rows and 28 columns of cells on a presentation page. The width of columns is discussed in Lesson 6.

Principles

B 4.2

The most difficult part of preparing a presentation page is deciding what is wanted in the report. It helps to sketch on a piece of paper what the report should look like. With experience, it may be possible to do this straight on to the screen. Some general guidelines first of all :

— keep each report as simple as possible

— consider those for whom each report is intended. If two people need reports with differing requirements it is simpler to make two reports rather than one

— where results are to be presented as columns and rows the table may fit better one way than the other. Thus a table having long columns would fit better if arranged down the page than across it. Whichever arrangement the recipient prefers can be accommodated subject only to the limitations of the printer being used

— column titles should be explicit rather than abbreviated. A total saying TOTAL ACTUAL SALES is better than just TOTAL, so that the reader does not have to guess what total is referred to.

Composing a Report

As with other moneybook pages a presentation page may be selected by pressing leave and entering a page number. **B 4.3**

Presentation page P01 is used in this lesson. The page layout is specified by composition formulae called compositors. The lesson demonstrates the use of the following compositors :

Item: data from a column at a specified or implied date
Text: for any desired wording Line: drawing vertical or horizontal lines
Date: absolute or relative
Keep: to keep a compositor for entry into more than one cell.

As with graph pages each presentation page has a title which must be given before proceeding. A base date should also be given but by default the base date is given automatically as the start date.

Subsequently dates may be given on the page relative to the base date. The user manual explains base dates and absolute dates. The user manual also explains implied dates, implied columns and their zones of influence.

Implied Data

Certain data on the presentation page may be selected and presented on the report by inference. This applies mainly to numbers chosen by the Item compositor. For example, look at **B 4.4**

row 6 column 2 of the presentation page P01 (working side). With the spotlight positioned on this cell the top line shows that the Title compositor has been used for bringing the column title of column M01a (VOLUME) into this cell of the report. Move the spotlight along the row (row 6) and see that three of the cells contain the two letters It. Notice in each case that the top line has two gaps, one for a column number and one for a date. But both are empty. This illustrates how the combination of Title to the left and Date above, has defined the contents of these cells in this row by inference.

As noted above a base date can be chosen but by default is given as the start date. Base date is then used as a reference point. Unless specified as absolute, all references to dates on presentation pages are relative to the base date.

Therefore a change to the base date causes the report to be produced for a different time span. Move the spotlight to row 3, columns 3, 5 and 7 and see how the dates have been defined.

Notice that in row 4 there are entries in presentation columns 4, 6 and 8 showing headings labelled '%' which in each case was entered using the Text compositor. Below each of these headings in rows 12 and 16 the items have been entered by specifying the column number, while the date is inferred. This can be checked by putting the spotlight on to any or all of the 10 instances of this that occur in the columns 4 to 8 and examining the detail in the top line. The date can be inferred as each item is in the zone of influence of the appropriate date either above or one column to the left of it. Most of the items on the page may also be inferred from the Title in the row. However, the row title cannot be used to infer the modelling column containing the data to be shown under the heading '%' (unless it were presented on a separate line of its own) so the column number must be specified in each appropriate cell. If it were not specified the wrong item would be shown because the cell would fall in the zone of influence of the item to its left and would give the wrong result.

For a more detailed definition of zones of influence refer to the user manual. This example has been constructed to illustrate their effect. Experiment with, say, the cell in row 12, column 4

by deleting the column number M02e and entering while the gap is empty. The result would then be 500 rather than 50.0.

Construction

B 4.5

Title compositor To add to the report fill in the elements as yet unspecified.

B 4.5.1

Move the spotlight to row 14 column 2. The spotlit cell is empty at the moment as is the rest of the row (from column 3 to column 8). Put TOTAL RUNNING COSTS into row 14. Use the search procedure to find the relevant column number M02c. Select the Title compositor and insert this number in the top line. Then enter into the cell.

Item compositor Move the spotlight one cell to the right (row 14, column 3) and using the compositor called Item enter the required item by inference, leaving the gaps for column number and date empty. The result is the value 250 taken from JAN84 in the modelling column M02c. This may be checked by turning to page M02.

B 4.5.2

Now repeat the process for row 14, column 5, only this time insert K for Keep in the gap at the end of the top line and press return. This allows the spotlight to move to column 7 without losing the contents of the top line. The entry may be repeated and the effect checked with page M02.

Press f 1 to see the result of the presentation. Go back to M02 to confirm the values that now appear in row 14 of the report.

Notice how the contents of the top line remain unchanged while Keep is specified. Delete Keep before moving to the next paragraph.

Line compositor Move the spotlight to row 8, column 2, and notice that a dotted line has been entered using the Text compositor. Change this to a continuous line using the Line compositor. The steps are :

B 4.5.3

– Press delete line to clear the top line
– Type **LI** (which will expand to Line)
– Press help to get more information for the Line compositor
– Fill the first gap with **H** for a Horizontal line and press return
– Confirm that this has the desired effect by looking at the results side.

This completes the work on presentation intended for this lesson. Other compositors are discussed in Lessons 6, 7 and 10.

Bookmarks **B 4.6**

A Bookmark is the term given to one of five function keys that may be set to turn to the results side of any page in the moneybook at a single touch. Touching the key again causes the page previously on the screen to reappear.

The function keys f 2 to f 5 may be set as bookmarks by the user. The bookmark facility permits the user to move rapidly from the page currently being worked on to another for looking, perhaps, at the effect of the work being performed. For example, one may be performing some modelling activities on page M01 and wish to see the effect on a graph defined in page G01. One of the bookmarks, say f 2, can be set for G01. Pressing bookmark f 2 then produces the graph in G01. Pressing the bookmark key again will return the user to the page being worked on: in this case M01. Function key f 1 is predefined for the particular page that is on the screen from time to time whether it be a modelling, graph, presentation or summary page. This facility has been used in earlier lessons.

See how the other four bookmarks are used :

Press leave to obtain 'Which service please'
Press help.

This produces the list of services available. Notice that B stands for Bookmark a page.

Type: **B** return

Notice that f 1 has already been defined. Now set bookmarks f 2, f 3, f 4 and f 5 for graphs pages G01, G02, G03 and presentation page P01.

Type: G01 in the cell labelled f2 return The spotlight moves down. Repeat the process for each function key. Press help if anything is unclear.

Go to page M01 and try the bookmarks that have been set to see their effect.

Moneyprint B 4.7

Selecting pages from a moneybook for printing is straightforward.

Press leave to obtain 'Which service please'

Type: P(rint) and press return

As should now be familiar with Moneywise, this reveals a screen with cells to be filled in. The screen defines the moneyprint for printing or filing.

To obtain printed copies of cover, contents and the key page, simply enter 1 in the corresponding cell. For the other pages enter either a single page number or a range (for example, either 1 or 1-3). Note that in the cell for COVER TITLE and COMMENTS space is available for suitable text to describe the contents of the moneyprint on the cover page when it is printed. Remember the spotlight may be moved about the page and help pressed to see what is required in each cell.

Try printing a Cover page putting in a suitable title (for example TUTORIAL LESSON 4 — THE RESULT) and appropriate comments (THIS LESSON INTRODUCED PRESENTATION PAGES, BOOKMARKS AND PRINTING).

Also print, say, pages G01 to G03 and P01. The printer type described on the screen must be set to match the printer attached. Ensure that the printer is connected to the computer and switched on. If in doubt look at the Installation Card.

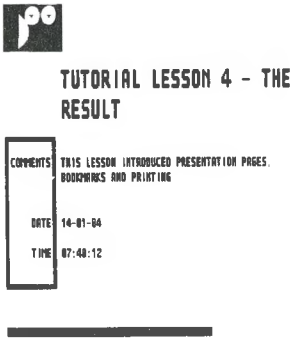


Fig. 26 A Cover page

A moneyprint can be produced at once or filed for printing later. If printing is to be deferred, enter a name in the cell labelled FILE NAME. This causes a copy of the material to be printed to be saved on the file. The contents of the file can be printed later using the print service offered by the Manager and entering the relevant file name.

The cells in which paper and print sizes may be specified are described in detail in the user manual. Each has a default setting which may be satisfactory for preliminary use. The specifications have the effect of matching the required report to the space defined as being available on the printed page. Thus a report containing only a small table may be spread out too much giving a less attractive result. In this case the lines per inch (LPI) or characters per inch (CPI) should be altered to create larger margins in the appropriate places to confine the printed result to a smaller area. Experiment by changing the dimensions specified in these cells, especially to vary the size of a report. For example, for the report on P01, it may be necessary to make some changes to achieve the most pleasing result. The logo and banner may be omitted by using D- or F- as appropriate.

To print the result at once leave the cell labelled FILE NAME empty and proceed. Notice that the style is set to D(raft) for rapid printing. If a neater looking result is required, change this to F(ine).

The detail specified on a print page is retained when a moneybook is saved and may be revised repeatedly.

Conclusion

This is is the end of Lesson 4. Some important aspects of the Modeller have been covered.

Presentation pages	9
Base date	5.6.5
Implied data	9.5
Compositors :	9.7
Item with Keep	9.7
Line	9.3
Title	9.6
Bookmarks	4.3
Printing	4.5
Immediately	
Saving for later printing	

The result of Lesson 4 can be compared with the moneybook OVERVIEW demonstrated at the beginning of this Tutorial.

At this stage, we believe you will be able to build your own moneybooks. Except for Moneypost and Summary pages — covered in Lesson 5 — you have covered all the basic Moneywise facilities. Initially, your models will be as straightforward as the one you have seen and probably experimental in nature. We suggest that you carefully read the next section before committing yourself to operational moneybooks. Finally, before you reach the stage of building very large or complex models, we recommend that you review the remaining lessons. You are sure to find techniques or methods of approach that justify the time spent on them.

TUTORIAL SECTION C

Mid Tutorial Summary

C

Looking back

C 1

At this half way stage in the tutorial you should be familiar with the Moneywise program and be ready to use more complicated formulae and try more advanced applications.

However, you will have learnt all that is needed to begin practical modelling. Let us review the basic principles underlying Moneywise.

Moneywise brings together the things the modeller needs :

STRUCTURE: by providing the Moneybook (a book like structure) having pages with specific purposes. There are pages for modelling, drawing graphs, and laying out reports to your own design.

INTEGRATION: by making it easy to turn from one page to another at the touch of a key so that results of a new assumption, or change to a model, can be reviewed in seconds.

SPEED: Calculations are fast. Recalculation is faster still because only that part of a model affected by new assumptions is recalculated.

QUALITY: by producing quality reports that can be given with confidence to the board or bank manager. Everything seen on the screen can be printed.

Moneywise emulates the simple calculations people make before taking decisions, but adds a new dimension — graphs and reports set out as the decision maker likes to see them.

The aim of Moneywise is to give the decision maker a computer version of his own working method; to give the controller a system for producing better reports than has hitherto been possible. Moneywise enables you to make up-to-the-minute analysis and present the results with confidence as a report.

To achieve these objectives the designers of the system have combined microcomputer technology with a new approach to modelling:

– The typical trial calculation is done in no particular form – rather it is done as the decision maker's ideas evolve. Moneywise emulates this 'free format' development by allowing models to be built in any desired order while providing special facilities to keep track of details. These facilities include the Moneysearch and matching facility; also the Contents and Key pages which are compiled automatically and can be referred to on the screen or reviewed in print.

– At any stage whilst modelling you can turn to a graph that portrays the evolution of ideas.

– The model may be summarized in Presentation pages which may be simple or detailed. The layout may be designed by you.

– Moneywise provides a set of general and specialised formulae to help build models simply. Simple formulations, in turn, make models easy to change. You will not find abstruse formulae that you are unlikely to need. In addition the advanced modeller may introduce complex expressions if desired. It should be noted, however, that the more complicated the expressions the more difficult the review and subsequent alterations.

– The Moneywise System has been designed for flexibility. Many columns provide room to set out relationships simply and introduce new factors as need arises. The memory management in Moneywise handles large models without running out of memory.

Moneywise makes modelling simple enough to replace the scratch-pad in decision making and simplifies reporting, printing, and presentation. It has particular advantages over other financial modelling systems

– Modelling is in columnar form; dates laid out down the side. This form enables 72 cells or items of data to be set out on one screen. When a formula is defined in a column, it applies to the whole column. This makes defining columns

quick without the need to 'replicate' formulae and enables calculations to be performed faster.

– Summary pages enable selected columns of modelling pages to be placed side by side for detailed review on the screen or in print.

– Moneysearch is a 'search and match' facility. It enables the modeller to find a column and examine its relationship with others. It also allows the 'forward booking' of new columns.

– Bookmarks allow the modeller to turn up any page, whether a graph page, modelling page, presentation page or other page.

– Printing, especially with a suitable dot matrix printer is particularly easy and flexible. You may choose any or all pages of a moneybook to be printed.

Housekeeping Before starting your own applications, some house keeping matters are summarized : **C 2**

– Back-ups: Useful work should be saved in a file at regular intervals (perhaps half hourly) so that work is not lost because of machine failure or other cause. The work saved should be copied onto back-up disks at the end of each day's work.

– Files – Moneybooks: Like traditional paper files, information filed on disks must be stored under sensible names for later retrieval. It is worth devising clear titles to describe contents. File contents can be reviewed using the Manager; the use of descriptive titles eases the review. It is good practice to set the date each time the computer is turned on because this date is automatically recorded when a moneybook is filed.

– Modelling: The moneybook being worked on is held in the computer's memory. It is lost if the machine is switched off. So moneybooks should be saved regularly. If a moneybook is opened from a file on disk, that file remains unaltered; not being affected by current modelling activity. A file on disk is changed, however, when its name is used for storing an altered moneybook. See the User Manual, Chapter 13.

Looking Forward

C 3

The tutorial goes on to use examples of the way in which Moneywise handles some of the modeller's more common requirements including:

variance analysis
interest and tax calculations
net present value
return on investment
fixed asset depreciation
loan amortisation
annuity calculations

The Tutorial also shows how profit and loss account, cash flow and balance sheet statements may be set out. You also practise with presentation pages for advanced layouts.

The second half of the tutorial assumes you are familiar with the following features of Moneywise:

– Opening, storing, closing and printing a moneybook.
– Building models, amending and transferring data
– Drawing graphs and preparing reports
– Using moneysearch and bookmarks
– Using some of the Manager's services
– Renaming and deleting files (See 2.10-11)
– Housekeeping, especially back-up of models and data and setting the clock

Reminders

C 4

The examples in this tutorial are not intended as a work of reference. They serve as an adjunct to working with Moneywise on the screen. Accounting conventions vary, and you should satisfy yourself that those used here suit your requirements. Should you wish to modify one, open the moneybook and, after changing it, file under your own filename. Consult the User Manual to assist you.

Whilst working through the tutorial you may wish to print the results of each lesson for future reference. Printed results may help as a reminder of how certain matters have been approached. Alternatively you can look at the results of each lesson on the screen.

TUTORIAL SECTION D

PRACTICE & APPLICATIONS LESSONS 5 TO 10

CONTENTS **LESSON 5**

LESSON 5

D 1

Introduction

D 1.1

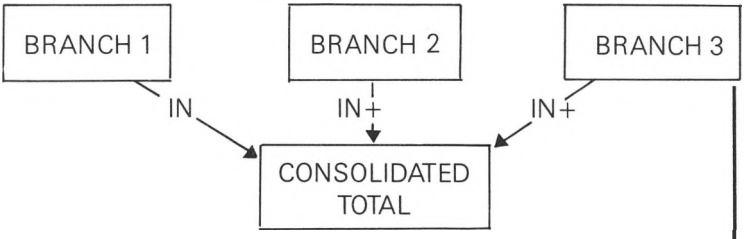
The purpose of this lesson is to present Moneypost which is used to transfer data between moneybooks. This could be for consolidation (by adding numbers together) or calculating variances (by subtracting numbers from each other) or sending data to a new moneybook for further analysis. The transfer is made by using the service T and is best understood by working through the example.

Moneypost is used in this lesson to transfer three separate results into one consolidated moneybook.

Consolidation

D 1.2

The figure below illustrates the objective:



The new moneybook must be set up to receive the relevant data. Use the example filed on the Tutorial disk as LESSON5. Print pages S01 and P01 for ease of reference when working through this lesson.

Preparing the moneybook

D 1.2.1

For the purpose of this lesson it is assumed that the business represented in RESULT4 is one of three similar branches of a company. The company wants to add all the results from its three branches to see a consolidated result.

OPEN Moneybook – **LESSON5**

The contents page shows that summary page S01 has been prepared. Turning to the working side of page S01 six cells can be seen in which to specify column numbers; five have been filled :

M01a, M01c, M01e, M02a, M02b

Turning to the results side reveals that the titles are respectively :

VOLUME, TURNOVER, COST OF GOODS SOLD, SELLING COSTS, OVERHEADS

and that the moneybook contains no values. Turning to P01 and M01 shows that the model is the same as the model that has been built up step by step in the tutorial but has been cleared of all values.

Notice that the formulae in columns M01b EFFECTIVE SELLING PRICE and M01d EFFECTIVE COST PRICE have been changed to calculate the effective price by dividing the respective amounts (that are about to be transferred IN) by VOLUME. The result is to give the effective prices for each branch before consolidation and the effective 'mixed' prices after consolidation. These prices are displayed in the report on P01.

Notice also that the data to be transferred must be prepared in the same form as that in which they are to be received.

Preparing the moneypost OUT

OPEN Moneybook — **RESULT4** **D 1.2.2**

Before transferring data prepare the outgoing Moneypost in the same form as the one in LESSON5. Proceed as follows :

— turn to **S01** and fill in the relevant cells

— Type in a suitable title, say **MONEYPOST SUMMARY**

— Search to locate the relevant column numbers and insert them in the appropriate cells:

VOLUME, TURNOVER, COST OF GOODS SOLD, SELLING COSTS, OVERHEADS

— Turn to the results side to see the data thus selected for transfer. Set bookmark f 4 to **S01** for later use.

— Press leave and select service **T**, then proceed as follows :

– In the (spotlit) cell labelled MODE, type **OUT** return.
More cells appear and the spotlight moves down.
– Give the file a suitable title. This might be **BRANCH A RESULTS FOR CONSOLIDATION** return.
– Move the spotlight down to the cell labelled SUMMARY PAGES and insert **1** (the number of the summary page containing the data for the moneypost) return.
– Put in the dates: **JAN84** and **DEC84** return.
– File the information with a suitable File Name – **BRANCHA** and make a note of the name used.
– **O.K. to file?** Enter Y return

The data are now filed ready for transfer IN to the consolidating moneybook.

Notice that the data transferred in this case are extracted from modelling columns via a summary page and inserted into modelling columns via a summary page in the receiving moneybook.

Now to prepare a second moneypost. This would come from a different moneybook but for the purpose of this lesson the same moneybook RESULT4 is used. Change some of the data as follows :

– Turn to M01 and alter the figures for JAN84 to DEC84 in each column as follows:

M01a VOLUME	**250**
M10b SELLING PRICE	**9.00**
M02a SELLING COSTS	**265**

– Turn to **S01** by pressing f4. Then press f5 (set in Lesson 4) to see the data about to be transferred.

– Again select service **T** and proceed as before:

– Transfer Mode	**OUT**
– Title (say)	**BRANCH B RESULTS FOR CONSOLIDATION**
– Summary	**1**
– Dates	**JAN84** and **DEC84**
– Name (say)	**BRANCHB** (and note it)
– O.K. to file?	**Y**

Repeat the procedure for the third moneypost:

– Change the values of some items again : say

M01a VOLUME **325**
M01b SELLING PRICE **8.50**
and for variety
M02b OVERHEADS **75**

– Review the results with bookmark f4 and bookmark f5.

– Select service **T** and file under say **BRANCHC** (and note it).

The Moneyposts are now safe on disk and the computer may be allowed to forget the latest work.

Transferring IN OPEN Moneybook - **LESSON5** **D 1.2.3**

Proceed as follows:

– Re-examine the model pressing f4 and f5 which show columns waiting for data to be transferred.

– Select service **T** but this time type **IN**.

Notice the screen layout unfolds as it did when transferring OUT (above) and the information to be provided is exactly as before. Remember to type the same name as the moneypost filed earlier – **BRANCHA** if that was used.

– OK to proceed? Answer **Yes**. As soon as the cursor in the top line has stopped blinking the first file is transferred. Press f4 and f5 to check the result.

– Proceed to the next Moneypost: Select **T**– only be careful. On this occasion **IN+** is required in order to add the next file to the first one. Using IN would overwrite – lose – the first set of data; IN- would deduct the new data from the first.

– Proceed as before with **BRANCHB** (or the name that was used) and see the effect by pressing f4 and f5. Also look

at page M01 to see the calculation for EFFECTIVE SELLING PRICE M01b.

— Repeat the process with **BRANCHC** using **IN+**. The three different sets of data are now consolidated. See the effect by pressing f4 and f5 again.

Store the result and compare it with RESULT5 which is the result of the assumptions used in this lesson. If the suggested steps were followed the result should be the same as RESULT5 in the tutorial. It would be possible to store the recent work as a moneypost with an appropriate name such as COMBINED, using the procedure set out above.

For interest, repeat some part of this procedure — perhaps finding the difference between BRANCHA and BRANCHB. Remember the moneyposts are still filed and can be used as often as desired until deleted.

Conclusion

In this lesson the basic steps for data transfer by Moneypost were introduced:

D 1.3

– ensure that the receiving moneybook has columns relevant to the data being transferred

– ensure that the columns being used for the transfer are compatible in both Moneybooks. In this example a summary page was used, but modelling pages can be used in the same way.

– select transfer mode IN or IN+ or IN- and label moneyposts with care.

Section 4.6 and Chapter 10 of the User Manual cover moneyposts in more detail. Section 5.4 of the User Manual covers summary pages. More advanced uses of moneypost are shown in Lesson 6.

LESSON 6

D

Introduction

D 2

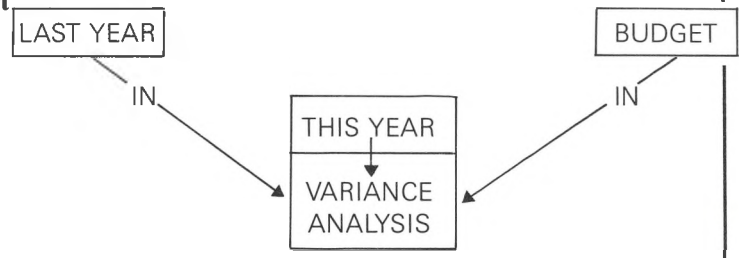
The purpose of this lesson is to carry out a variance analysis comparing THIS YEAR with LAST YEAR and BUDGET.

The analysis is to show the difference or variance between two values for the same item. For example if VOLUME in January LAST YEAR was 580 and in January THIS YEAR was 775, the variance would be 195. The analysis is done in this example by using moneyposts to bring the relevant data for LAST YEAR and BUDGET to compare with THIS YEAR in one model. The model contains actual results so far together with the current forecast for the remainder of the year.

Preparing the Variance Report

D 2.2

The process may be represented schematically:



As suggested in the previous lesson, you may wish to look at the result first to gain a clear picture of the desired outcome (RESULT6). Print pages S01, S02, S03 and P01 for ease of reference when working through this lesson.

Preparing the model

D 2.2.1

OPEN Moneybook – **LESSON6**

Notice that the start date selected is 1. The reason is to avoid confusion when putting values from different time periods side by side in the same model. It is possible, now or later, to change the dating back to monthly. However, the text below assumes no change.

Look at the contents page, scrolling down the page as necessary, and notice that two new summaries have been prepared, a number of graphs drawn up and that presentation page P01 now contains a report on variances.

The first summary page (bookmarked f2) may look familiar as the means by which information was transferred OUT and then IN+ to consolidate three branches to get to this year's current figures. You may recognise the figures prepared in Lesson 5.

Turn to the next two summary pages and note particularly that S02 is for BUDGET and S03 is for LAST YEAR. This is important because it can be seen from the column numbers on their working sides that information is directed to separate modelling columns for analysis.

An examination of P01 (bookmark f5) reveals the current year's figures awaiting comparison with BUDGET and LAST YEAR. It can be seen that the model is the same, but with additional pages M05 to M12 used to calculate the variances from BUDGET and LAST YEAR.

Transferring the data

To complete the analysis proceed as follows: **D 2.2.2**

— Turn to service **T** and bring **IN** the budget figures in the moneypost which has the same name, **BUDGET** already prepared for this tutorial. Be careful to direct the information into summary page **S02** and remember that the dates are **1** to **12**.

If a mistake is made all is not lost. Simply (re)open moneybook LESSON6 and transfer **IN** the moneypost file called BUDGET once more.

— repeat the procedure for moneypost **LASTYEAR** again being careful to direct the data to the right summary page — in this case **S03**. If an error was made a new start could be made or it might be possible to correct the error by using IN- then starting step 2 again.

If still uncertain about moneypost, refer to the notes on the subject in Lesson 5, reworking the lesson if necessary.

— turn to the variance analysis by pressing f5 and see the result for period 1. By changing the base date it is possible to see the complete analysis for any period. By scrolling down the page the full year's result can be explored.

— to see another use of summary pages turn to the next available one (S04) and enter a suitable title — perhaps **REVIEW OF VOLUMES** and the column numbers for volumes as follows:

LAST YEAR, VARIANCE, THIS YEAR, BUDGET, VARIANCE — using moneysearch on **'VOL'** reveals 8 matches of which :

M05c, M05d, M01a, M05a, M05b
are the columns required. Enter the column numbers in the cells on S04 and see the result.

— repeat the process to REVIEW COSTS and to REVIEW CASH FLOW. Note that these results can also be seen in RESULT6. SELLING PRICES, TURNOVER, GROSS and NET PROFITS might also be reviewed.

The analysis of variances is now complete for the current year's figures, and the moneybook can be printed, filed, forgotten or used for further analysis. At this stage one might choose to end this part of the lesson. If the suggestions above have been followed P01 will show CUM. CASH FLOW is £23,041, £258 worse than budget, but £3,811 better than last year. Alternatively one might go on to consider the effect of reforecasting the performance of one of the branches and reconsolidating and analysing the results following the procedure used in Lesson 5.

Further analysis This approach can be recommended for further practice. However, a simple alternative is to add IN+ or subtract IN- the moneypost for BRANCH A as if it were additional business or perhaps sold off, and see the effect on the variance analysis report. **D 2.2.3**

Select moneypost service **T** mode **IN+** or **IN-** and remember to direct it to **S01** dates **1** to **12** and specify moneypost file **BRANCHA.** Turn to variance analysis, bookmark **[5]**, and see the result.

If the tutorial files have been used the CUM. CASH FLOW would be £5,300 better than BUDGET and £9,369 better than LAST YEAR.

Extended Presentation

The last part of this lesson is intended to build on experience of laying out presentations, especially to use Copy and Move to extend sections of a report. Proceed as follows:

D 2.3

Copy compositor

D 2.3.1

— Turn to the working side of P01. The intention is to lay out three separate months side by side, together with a summary of the three months so produced.

— Move the spotlight to Row 1, Column 8

Type: CO

— Fill in the top line:

Copy 17 cells down and 7 cells across, starting at cell in row 1 col 1 keep (keep for repeated use) return

and see the result.

— Move the spotlight to Row 1, Column 15 return — this sets out the report for periods 2 and 3 subject to the dates.

— Move the spotlight to Row 1, Column 22 and alter the top line to read:

Copy 17 cells down and 7 cells across, starting at cell in row 20 col 1 return

This sets out the cumulative report for 12 periods to be changed in a moment to 3 periods.

Width compositor

D 2.3.2

Note that there are three standard widths used in the report: 1, 10 and 20 characters wide for the three different types of column used. These widths should be set as appropriate by working across the top of the page using the Width compositor.

Set the column widths using Width and Keep.

Now to amend the remaining elements:

– alter the dates in Row 1 column 13 to +1, Row 7 column 9 to +1 and Row 1 column 20 and Row 7 column 16 to +2 and check the result by pressing f 1.

– to amend the last section which will show the quarterly results :

– change the heading by moving the spotlight to Row 1, column 24 and amending the text to say **QUARTERLY VARIANCE ANALYSIS TO PERIOD**

– in column 27 alter the date from 12 to +2.
– in the body of the report change 12 to 3 in each place it occurs to give the total of only one quarter's result.
– alter the date in Row 7 column 23 to +2

The main lesson is now complete and the result can be compared with RESULT6.

Move compositor

The more ambitious user may go on to complete the layout by repeating the procedure. Note that to do this the cumulative summary, that was copied in D 2.3.1 above, should be moved using the Move compositor to the bottom right-hand corner as follows: **D 2.3.3**

– move the spotlight to Row 55, column 22.

– fill in the top line:

Move 17 cells down and 7 cells across, starting at cell in row 20 col 1 return

– use Copy and Keep to fill in all the other spaces for periods 4 to 12 and amend the dates appropriately

– compare the result with RESULT6X.

If the printer permits, it may be of interest to print this report. However the layout is now 290 characters wide and must be reduced by 60 characters to fit, say, a 230 character printer. This can be achieved by reducing each of the 20 columns that are 10 characters wide to 7 characters each. Try it. It is easier to do than to describe.

Conclusion

In this lesson the following topics were demonstrated:

D 2.3.4

Moneypost
notice its flexibility and the care with which it should be used. (see section 4.6 and chapter 10 of the User Manual).

Analysis of data from different money books or different time periods — variances

Presentation
especially Date, Width, Copy and Move Keep. (see chapter 9 of the User Manual)

Additionally you may have noticed the method used to calculate selling price variances, especially cumulatively. Although referred to this was not highlighted in the lesson but has been included as an example that can be referred to at a later date. Again it is suggested that a full print of the moneybook RESULT6 may be useful for future reference.

CONTENTS **LESSON 7**

Introduction D 3.1

The purpose of Lesson 7 is to introduce a group of formulae not yet used — periodic, maximum, minimum and average, using markers. The lesson also advances the laying out of presentations using more of the compositors.

Moneywise has been designed to make good looking reports easy to produce, on the screen first, then printed as desired. With a little practice especially with line drawing, justifying columns of text or numbers, and adjusting column widths, laying out reports becomes second nature. Remember to use Keep, and that Move and Copy are particularly useful.

The presentation work suggested below for this lesson is straightforward and when completed could extend the layout on P02 or go on to P03.

OPEN Moneybook — **LESSON 7**

A look at the contents page reveals that a graph G04 and a presentation P02 have been introduced. Bookmark f 5 has been set. Pressing this reveals a partly completed report entitled YEARLY ANALYSIS showing headings arranged for HIGHEST AMOUNT, LOWEST AMOUNT and AVERAGE AMOUNT — a hint of the subject to come.

A look at modelling pages M01 to M03 reveals the outcome of LESSON5. Notice the use of the brought forward formula in column M03f in conjunction with the compound formula in column M07a. Their use in this manner is explained in Lesson 9. Using the values from RESULT5 which are taken as the basis for the analysis, proceed as follows:

Marker Columns D 3.2

Turn to pages M04 to M06 to see the new analysis columns and notice in particular the markers in columns M06d, e and f. After a brief look at the others only one of these will be used in this lesson. The other two have been shown to illustrate more fully how markers may be set.

Turn to the results side of M06 with bookmark f 1 and notice the figure at DEC84 in column a is £16,421. This is the highest

value for the month-end bank balance at any time during the year i.e. the period between the marks in the column that has been chosen, M06d. Look at the working side by pressing f 1 and see that the formula has been defined to reflect this.

If the formula is changed to select the marks in say M06f, the quarterly analysis of the same column of data will be obtained. Try it and see that the maximum value £16,421 occurred in the 4th quarter. A look at G04 by pressing f 4 will confirm the analysis by showing the history of the bank balances graphically.

The adventurous can decide to use the quarterly or half yearly analysis and to check the work with RESULT7Q or RESULT7H respectively. However, the lesson below assumes that the yearly analysis has been chosen. So change the formula in M06a back again to refer to marks in M06d - the annual marks.

Periodic Formula

Turn to M04 and fill in the formulae in the last two columns. The four columns already filled in to the left clearly show what to do. Remember moneysearch will confirm column numbers and titles. Now complete the three columns on M05 and the two on M06. The modelling is complete and the report can be written.

D 3.3

Presentation

Turn to P02 (don't use bookmark f 5 because this only goes to the result side — and back). The working side is required but turn the page over at once just as a reminder of what is aimed at.

D 3.4

Notice that the dating is arranged for the yearly analysis:

— Heading appropriate to annual results
— Da+11 (=Base JAN84+11 months, ie. DEC84)
— TO12 (=Total of 12 values in the relevant modelling column up to the chosen date)

If the half yearly or quarterly report is to be written it is these that must be changed.

Join compositor Notice also that the Join compositor has been used in rows 3 and 4 to join column 4 to column 3 to allow room for the required text with appropriate underscoring. **D 3.4.1**

Move the spotlight to row 3 and 4 in column 4 and see the compositor in the top line. The cursor is on 'L' for Left to join the cell to the adjacent one on that side.

Move the spotlight to rows 3 and 4 in column 3 and see the text displayed in full in the top line, but truncated under the spotlight because the cell width is too narrow on its own.

Text compositor Proceed as follows: **D 3.4.2**

– Move the spotlight to row 16, column 2, and enter **Text BANK BALANCE**, and see the result.
– Move spotlight to:
Col 3, **Item from column M07a** – select Keep return
Col 4, Search **'BANK'** and insert the Item required which is **M06a** the MAXIMUM, into top line return
Col 5, next match, insert **M06b** MINIMUM return
Col 6, next match, insert **MO6c** AVERAGE return

Check the result with page M06. Notice that the date need not be entered because it is taken by inference from the dating (already) set in the report above. Thus changing the dating for VOLUME will also change the dating for BANK BALANCE automatically.

Now complete the other spaces in the report checking the results with modelling columns as necessary. Again use moneysearch to find the column numbers required; insert them in the top line and press return.

Justify compositor To justify all the new entries clear the top line and prepare to centre all the entries just made in the report: **D 3.4.3**

Justify **C**entre _____Keep
and move the spotlight over each figure to be centered and return

Note that the Justify compositor can be used to justify numbers as well as text and this applies both to single cells and to cells that have been joined with the Join compositor.

Line compositor Now draw a box round the report with the Line compositor. Remember: **D 3.4.4**

— Horizontal lines occupy the middle of a row which cannot then be used for anything else
— Vertical lines occupy the rightmost element of a cell — the terminator — without any effect on the rest of the cell
— Corners and joins are constructed automatically.

Move the spotlight to row 2, column 2 and prepare to draw horizontal lines:

Line Horizontal_____Keep return

Move the spotlight across each cell to column 6, entering the horizontal line in each. Once the program knows the direction it has to go the spotlight moves automatically.

Repeat in row 17, columns 2 to 6.

Move the spotlight to column 1, row 3 and select **V** (for vertical) and press return.

Move the spotlight down and repeat as far as row 16. Notice that the corners are constructed automatically.

Move the spotlight to column 6 (not 7) and repeat between rows 3 and 16.

The report is now complete but can be altered or extended whenever required.

This recent work may be saved and compared with Tutorial:

RESULT7A for annual analysis
RESULT7H for half yearly analysis
and RESULT7Q for quarterly analysis.

Conclusion

This lesson introduced the Periodic formula (see section 7.5 of the User Manual) and developed the use of all the main presentation compositors, especially Date, Line, Justify and Keep (see chapter 9 of the User Manual). The lesson also introduced the use of moneysearch (see chapter 8 of the User Manual) for locating items from columns of data for entry in reports.

This is the last lesson based on the same model that was begun in Lesson 1. Lesson 8 explores more advanced modelling.

Introduction D 4.1

Lesson 8 is an illustration of some of the more advanced formulae in Moneywise. The theme of the model built up in the previous lessons is not followed here. Rather a new moneybook is opened and is used only for this lesson, although as arranged in earlier lessons both an initial and a resulting version have been provided.

The moneybook contains three separate models:

i . Project Analysis	Page M01 to M06
ii . Corporate Taxation	Page M07 to M09
iii. Fixed Assets & Depreciation	Page M11 to M15

All three are modelled on a yearly basis where each row of the modelling page represents one year. Each model is used in turn during the course of this lesson.

It is presumed that you are now familiar with the basic mechanics of the program. This lesson is written to reflect this. Any difficulties should be resolved by returning to the relevant earlier lesson.

OPEN Moneybook – **LESSON8**

Project Analysis D 4.2

Turn to pages M01 to M06 and through bookmarks f 2 and f 3 to the graph G01 and report P01, summarizing the project. Briefly the proposal is to increase the productive capacity of a profitable (tax paying) company for an existing product by examining the implications of :

– Original cost and likely scrap value of the new equipment
– Depreciation over the life of the asset and the life of the product
– Additional income from the additional production
– Likely increase in overheads
– Tax effect
– Cash flow and return on investment, against a target (set initially at 25%) return.

Notice the use of the spread formula in columns M01d and e in conjunction with columns M05e and f. This enables items to be lagged other than by integers. Experiment with the phasing of cash flows by altering the proportion in each interval in columns M05e and f.

Notice in column M04c the high initial return, which is the effect of initial allowances, and the falling profitability as the useful life of the product and of the plant diminish.

The graph G02 indicates that the project pays for itself in 1989, but that the overall return reported on graph G01 is unacceptably low. What additional income is required to achieve the target?

Turn to column M02b and alter the assumption for margin for each extra unit by, say, **£2.00** each year, ranging now from **£4.20** in 1984 to **£3.50** in 1993, and see the effect, P01.

Notice the stars in 3 cells. These arise because the columns are now too narrow to contain the new numbers. Let's change them. Go to the working side (leave — P — 1 — return). Select the width compositor **(Width — 6 — Keep)** and move along the top row 1 to column 4 and press return . Repeat across to column 13 and watch the columns widen in turn. Now turn to the result by pressing f 1 . The new figures are displayed:

NPV £1,342 and ROI 30%

The graph also shows the improved position.

The analysis might continue:
Supposing the falling return at the end suggests a higher target rate to compensate for the risk, say 35% ?

Present Value formula

Turn to the column for DISCOUNTED CASH FLOW and NET PRESENT VALUE (search on DISCOUNT finds one column M04a) and alter 25% to **35%**. See the result with f 2 which shows G02 and next page which shows the next graph and changes the bookmark to G03. Look at P01 by pressing bookmark f 3 . Break-even falls in 1986. NPV is £869 and ROI is 30%. **D 4.2.1**

This result has been filed as RESULT8 with which alternative results may be compared.

Internal Rate of return D 4.2.2

The internal rate of return for this project may be determined easily — given that IRR may be defined as that discount rate at which the NPV is nil — by one or more iterations at different rates.

At 35% NPV is £869. Turn to M04a again and alter 35 to 65. The bookmark f3 reveals a new value of £162.

Similarly 75% gives £36
80% gives – £16
78.4% gives £0

Thus 78.4% is the internal rate of return for this project on the given assumptions.

What if? D 4.2.3

The results of other assumptions may be tested. For example:

— What if the new plant cost only £1,000 ?
— What if depreciation were accelerated ?
— How important is the scrap value ?
(What if, for example, the sale realized nothing?)
— On new assumptions, what is the IRR?

Corporate Taxation D 4.3

For the next part of the lesson turn to pages M07 to M09. This second model deals with estimation of tax liability. Differential rates of tax are assumed to apply :

— the first £100,000 is taxed at 30%
— the next £400,000 is taxed at 55%
— for profits over £500,000, the whole amount is taxed at 50%.

Tax formula D 4.3.1

Tax losses are carried forward and set off against future profits and the tax liability is adjusted accordingly. Notice how the special Tax formula handles this automatically in column M08b.

The method adopted is to identify the total taxable profit in each period. If the profit is over £500,000 the total is set aside. This amount is then deducted from the total taxable profit to arrive at the amount to be taxed at 30% or 55%. The profit to be taxed at 30% is set aside and the remainder by deduction, is taxable at 55%.

If formula D 4.3.2

Using the procedure described under Project Analysis above (use previous page and next page) look through modelling pages 7 to 9. Trace the method described above. Note particularly the use of the If formula for 'slicing' the profit into the three tax-bands. Use the bookmark f 4 key to look at the Taxation Report.

Alter the series of profits and losses to see the effect on tax liability and the profit after tax. Go to modelling page M08 (column a).

Enter a new series such as:

−100
50
250
600
150
−200
50

Make these changes and use bookmark f 4 to see the change in tax and profits after tax.

See the result in RESULT8 or try other assumptions for profits, losses and tax rates.

Fixed Assets and Depreciation D 4.4

This section shows how to model fixed assets, depreciation and disposal of assets. The model keeps track of the book value of assets, accumulated depreciation, net fixed assets and the profit or loss made on disposals.

Turn to pages M11 to M15 and the fixed assets report, bookmark f 5

Spread Formula The spread formula is used extensively for calculating the key columns in this application. Columns are designated for additions to fixed assets, expected life of the additions and proceeds from sales (disposals). The written down values are calculated in page M15. It will be seen that the Spread formula is a powerful device for calculating depreciation and similar applications. It is used in this example for deriving assets carried forward and current period (year) depreciation. **D 4.4.1**

Alter the life of the asset (column M11b) in 1984 to say 6 and the expected sale value to £2,500. Turn the page. Now add an asset purchased in 1986 for £25,000 with a 6 year life and likely sale value of £7,500. Repeat in 1989 with an addition for £33,000 with a life of 6 years and realisable value of £10,000.

Now press bookmark f 5 to view the effect on depreciation and fixed assets balance and review pages M13 to M15. This model is suitable for assets of a single type or for assets of different types but having the same spread of depreciation.

Realize The Realize formula may be used in several forms. Its simplest form lags items between periods. In this lesson it is used in its fullest form in M11d and e. **D 4.4.2**

The written down value of the original asset at the time of sale is calculated from the original costs, M11a, the effective depreciation, M12a, and the life of the asset, M11b.

The proceeds of sale, as predicted at the time of purchase, are carried at full value (100%) to the year of realisation, again M11b.

Note how this representation allows the effect of a single change in assumed asset life to be recalculated automatically, by keeping the written down value and the proceeds of sale in step.

It would be possible to introduce a probability factor representing the increasing uncertainty of predicting values as the interval increases. Try this with M12f and insert its column number in the second gap in the formula in M11e.

Conclusions

The results of this recent work may be compared with results saved on moneybook RESULT8. Go back to any of the sections discussed earlier if further study or clarification is required. Use the results side of modelling pages frequently for seeing the effect of various formulae as well as the answers to the 'what-if ?' questions.

This lesson has covered the following:

- Present value
- Tax (for carrying forward tax losses to be offset against future profits)
- If (for 'slicing' taxable profits)
- Spread (in this example for depreciating assets)
- Realize (in this example for the disposal of assets)

See section 7.5 of the User Manual.

CONTENTS	LESSON 9

Introduction D 5.1

This lesson covers five more applications in modelling and illustrates more advanced modelling with Moneywise. The lesson covers the following topics:

- forecasting market share
- investments and interest rates
- opening and closing balances
- loan amortisation
- annuities

The market share application is non-financial whereas the others are more financial in nature.

It is presumed that you are now familiar with the basic mechanics of the program. This lesson is written to reflect this. Any difficulties should be resolved by returning to the relevant earlier lessons.

OPEN Moneybook – **LESSON9**

The two models on pages M24 to M29 are intended to illustrate the use of the Value formula to write any expression you wish based on the operators available in the program and set out in Chapter 7 of the User Manual.

Market Share Forecasting Model D 5.2

The model has been constructed to illustrate how the total market size for a product and the share that an individual company derives might be determined.

The total market reflects or is influenced by:

- economic indices
- average earnings per head

For the purpose of this model these two are combined by multiplication to provide a method of determining the market size.

It is assumed that there are only three companies marketing an equivalent product and hence their individual efforts

influence the shares that they capture. Their individual market shares are influenced by:

— prices set by the companies
— amount spent by the companies on promotion

As would be expected, increase of prices by a company results in a decrease of market share. Decrease in prices results in an increase of market share assuming the other factors remain unchanged. Similarly, increases in promotional expenditure result in an increase of market share: decreases in expenditure would reduce market share. Market share can be determined in the following way for company A:

Market share % for company A

$$= \frac{\text{Factor for Company A}}{\text{Sum of factors for A, B and C}} \quad \text{x100}$$

where A, B and C are the three companies and the factor for Company A:

$$= \frac{\text{sum of all prices}}{\text{price set by A}} \times \frac{\text{expenditure of A}}{\text{sum of all expenditures}}$$

Note that the method adopted is only one possible way of modelling market shares and has been used for illustration only.

Maximum Minimum and Average formulae

The resulting market-share percentages are applied to the total market size to calculate the market share for an individual company. The model is also required to calculate for each company its revenue and profit (calculated as revenue less promotion).

D 5.2.1

Turn to modelling page M01 and notice that three levels of economic indices have been built in. On page M02 the combined index for the total market size is calculated. On page M03 the total market size is calculated for each of the three levels of the economic index (because the level of average earnings remains unchanged). Columns M03d to M03f filter from the three market sizes the minimum, average and maximum sizes of the total market.

Page M04 details the basic strategies of the three companies, covering prices and promotional expenditures. Notice that the following summarises the strategies:

	Price	Promotion
Company A	Highest	Highest
Company B	Middle	Middle
Company C	Lowest	Lowest

Pressing f2 causes a pie chart to appear showing the market shares of the three companies. As is evident company C's strategy of keeping prices and promotional expenditure low is not obtaining a large market share. Pressing f3 shows a bar chart of profit for the companies and this shows that company C is not performing as well as the other two. Let us try to increase the price charged by company C (so that it is in the middle) and increase the promotion (so that it is the highest) and see the effect this has on the market share and profit. Follow the steps below:

— Go to page M04 column c and change the values from £5.00 to **£6.20** for the intervals JAN84 to JUL84

— Change values in AUG84 to DEC84 to **£7.25**

— Move the spotlight to column M04f and change the values for intervals JAN84 to DEC84 to **£10,000**

— Use f2 to see the effect on market share

— Use f3 to see the effect on profit.

It can be seen that this increases the market share and profit for company C significantly, though in the short term company C has the largest losses.

Short Term Investments **D 5.3**

A model is required for analysing funds transferred to a short-term investment account. The model has to cater for interest charges on both negative and positive balances in the account. Interest rates are also assumed to be variable across time periods. The model is required to cater for monthly time intervals with compounding of interest payments taking place monthly. The rates of interest provided are on an annual basis,

hence they need to be converted to monthly rates. Turn to page M13 in moneybook LESSON9.

Notice that the amounts deposited and transferred to longer term investment are entered as data items (columns M13a and M13c respectively). Total invested amount (net of transfers out) is calculated in M13f and the net movements (deposited amounts less transfers) in M13e.

Interest and Rate formulae D 5.3.1

Interest rates on balances are entered in M14a. In M14b the annual rate in M14a is converted to monthly rates using the rate formula. Because annual rates are provided the number 12 has been entered for each interval in M14e. This in turn is used in the rate calculation in M14b. The interest is calculated in M15b and c using the interest formula. To obtain more information on any formula used in the model use the help facility described in the earlier lessons.

A graph has been defined showing the movements on the investment account and can be obtained by using the bookmark f5

To see the effect of interest on negative balances arrange for the transfers out to exceed deposits. In M13c enter 10,000 for JUL84 and turn to the results on M15 for the effect in columns b and c.

Now go to page M14 and alter the interest rate. Make M14a 15.00 for 6 months, then 20.00 and see the result.

It will be noticed that the same interest rate has been used for both credit and debit balances. This is because the same rates have also been used in Compound to calculate the closing balance. To introduce different rates of interest it is necessary to write a new expression using =VAlue in place of Compound. Compute the closing balance and introduce a new rate of interest for debit balances. Try it and compare your result with pages M17 to M19 of RESULT9.

Opening & Closing Balances

D 5.4

This part of the lesson deals with another common modelling requirement — opening and closing balances. These may be applied to cash flows, stock analysis, assets analysis and many other areas. At its simplest the requirement is to show:

The starting position	(opening balance)
The changes	(movements)
The closing position	(closing balance)

Look at the example of a bank account with these three elements, contained in moneybook LESSON9, modelling page M21.

Turn to page M21 and look at the basic structure. Notice that all relevant columns have been specified on the page but that column M21e is still empty (no data or formula has been entered).

Brought Forward formula

D 5.4.1

Opening balance is calculated using the Brought Forward formula. A value, in this example 100, is entered in the first gap and the results side of the page reveals this amount in JAN84 with dashes in every row thereafter. This is the simplest use of the formula. When combined with Compound a link is forged between brought forward and the accumulation of the movement column, in this case M21e. This column number must be put in the second gap, after 'then'.

Compound formula

D 5.4.2

The closing balance is calculated as follows:

Move to M21e and define the formula for it. The two columns involved are opening cash balance and net cash movements. It will be seen that closing balance is equal to the accumulated movement plus the balance brought forward. The necessary calculation is performed by the Compound formula as follows:

Type: =COmpound_ _with_ _at_ _%

The column number for the opening balance, M21a, goes into the first gap and the column number for movement to be accumulated, M21d goes into the second gap.

Obtain further help as necessary on the Compound formula and complete the gaps for column M21e. Check the results to see that the closing balance is indeed in M21e. Notice in particular that the column for opening balance now contains the relevant values from FEB84 onwards — the result of the link between Compound and Brought Forward.

In column M21f (ACCUMULATED CASH FLOW TO DATE) the compound formula has been used as it was in Lesson 2 to calculate the accumulation of the movements. It has been included here as a comparison of two possible uses of the formula (in columns M21e and M21f).

Loan Amortisation

D 5.5

Pages M24 to M26 contain the model for calculating monthly amortisation or payment, for a given loan M24a over a given period M24b, at a given annual rate of interest M24c. If any or all three data elements are changed or the interest rate changes during the life of the loan, the effect on monthly repayments is shown as to : principal M25d, interest M25e and in total M25f. These are graphed G11 and the effect of a charge can be seen. Try changing the rate of interest during the period and see the effect on monthly repayments.

Look at the expressions used with =VA. Notice the use of 'prior' in M25a and M25c to select the item from the prior interval in the nominated column. Notice also the use of 'if (M25a #-) else -' in M25b and M25c to leave a dash entry where appropriate rather than put a * which is the result of division by zero.

Graph other aspects of the model. Look for example at :

— The proportion of Principal to Interest:
G12 PIE JAN84 JAN89 M25d M25e

— The balance of the loan outstanding at any time:
G13 LINE JAN84 DEC93 M26a M26c M24f

Introduce the necessary column to show the original principal for the period of the loan:

M24f = spread M24a by 100% through M24b intervals

Introduce:
— The repayments versus principal:
G14 LINE JAN84 DEC93 M26a M26c M24f

Open the necessary columns on page M26 to calculate:

M26a Cumulative Repayments of Principal
M26b Cumulative Payments of Interest
M26c Cumulative Total Payments

Compare your results with those in RESULT9.

Annuities

Pages M28 and M29 contain the model for calculating the future or present value of a monthly payment for a given period at a given rate of interest, or conversely the monthly equivalent of a given future or given present value lump sum. **D 5.6**

A monthly payment of £100 for 36 months has a future value of £3,814 or present value £3,391 at 0.33% per month interest. A lump sum of £3,391 today buys an annuity of £100 per month for 36 months and is equivalent to £3,814 lump sum after 3 years.

What are the relevant values for monthly instalments of £150, £250 or any other values?

The results can be checked by doing the converse calculation. Enter the lump sum values in columns M28d and M28e and check the monthly values in columns M29e and M29f.

Note how the model is not concerned with the base dating. Each alternative is complete on its line across the two pages, and the base date could be arbitrary (or any of the alternative forms).

How can the model be used for different rates of interest? Use column M28f to enter different annual rates of interest :

M28f ANNUAL INTEREST RATE (Data) 4

and alter M28c to refer to M28f. This will allow different rates of interest to be entered for any alternatives being considered.

Enter three alternative cases — perhaps 100 monthly payments but for different numbers of months, say 72, 60 and 48, with interest at 6%, 8% and 10% respectively.

Compare your results with RESULT9.

The analysis might continue: What is the effect of zero interest rate? What is the effect of varying the rate of interest compared with varying the term ?

Presentation

Set up a report called CASH FLOW REPORT showing: **D 5.7**

- Opening cash balance
- Receipts
- Payments
- Net movement
- Closing balance

Put dates across the top for 12 months and a total column. Rather than show opening as well as closing balance, show the first opening balance as the closing balance of the prior period. Try it and compare the result with the result in the Moneybook called RESULT9.

Conclusion

This is the end of Lesson 9 which covered the following formulae:

D 5.8

- Average
- Brought Forward
- Compound
- Interest
- Maximum
- Minimum
- Rate
- Value expressions

Chapter 7 and the Update to the User Manual refer to these.

CONTENTS **LESSON 10**

Introduction D 6.1

Lesson 10 brings together the subject matter of earlier lessons. It presumes you are familiar with the basic mechanics of the program covered in the first half of this Tutorial and have worked through the second half.

Financial Statements D 6.2

This lesson provides a straightforward example of a typical business requirement
— the three basic financial statements:

Profit and loss account
Balance sheet
Cash flow

This is extended as part of the lesson to include a source and application of funds statement together with further practice of presentations by developing the layout of reports. The whole moneybook may be printed and kept as a worked example for ease of reference later. Although this model is of an accounting nature working through it should make it possible for those less familiar with the detail of accounting to prepare financial statements in future. This might be achieved by putting your own figures into the model and adapting its structure to fit minor differences. Alternatively a new model might be built using the example as a template and extending it as necessary.

OPEN Moneybook — **LESSON 10**

The moneybook contains the three statements on the three presentation pages: P01, P02 and P03 each of which has been bookmarked. There are two graphs one of which has also been bookmarked. Look at the contents page and use the bookmarks to look at the three statements. Also look through the thirteen modelling pages to become familiar with their contents.

Pages M01 to M03 contain the elements of the profit and loss account. To keep the model simple at the outset, depreciation has been entered as a data column and tax has been ignored.

Once the basic structure of the model has been understood these complications can be introduced at will.

Pages M03 to M05 contain the elements of the forecast cash flow statement. Opening and closing cash balances have been incorporated on M05. Page M06 contains the modelling of fixed assets, as an aggregation rather than as individual assets. A column (M06f) for stock has also been entered on this page. Page M07 shows how Trade Debtors may be modelled. Similarly Trade Creditors are shown on M08. Page M09 contains opening balances for total current assets, net current assets and total assets. These have been modelled to allow comparison between the statements for DEC83 and DEC84. The moneybook itself starts from JAN84. Page M10 models shareholders' funds. Page M11 includes totals for the balance sheet and M12 models the accounting of VAT. Finally, page M13 calculates the creditors for rent and rates.

Changes — Make the following amendments to the moneybook: **D 6.3**

Variables — Manipulate the receipts and payments pattern by varying columns M04a, M04c and M04f (for effect on M12b). See the effect of these changes on cash balances: bookmark f 2 **D 6.3.1**

Presentation — Change P01 to P03 to incorporate £ signs across the top of each column (but below SALES UNITS in P01) and down the pages against totals. Use the Move compositor to create extra rows and an extra column on the presentation pages. **D 6.3.2**

Units Compositor — Units can be entered by using the Text compositor but try using another compositor not previously discussed — Units. Press help for assistance if needed. **D 6.3.3**

Source and Application of Funds — Develop another report on P04 showing the sources and application of funds for 1984. Include in the report a balance sheet for DEC83 and one for DEC84. The simplest method is to use the Difference compositor to calculate the change from one year to the next year (12 intervals). **D 6.4**

Difference compositor

Difference is used in a manner very similar to the Total compositor which was introduced in Lesson 7 to which you might refer. Difference calculates the difference between the item selected and its equivalent from the specified number of periods earlier. Remember also that help is always available and the steps for filling in a new page are the same as those practiced in earlier lessons.

D 6.4.1

OPEN moneybook — **RESULT10** to see the intended result of items D 6.3 and D 6.4.

Extending the Model

Finally, extend the moneybook by introducing depreciation and tax calculations based on the examples in Lesson 9. Remember to amend the reports to allow for taxation. Stock movements could also be modelled.

D 6.5

Conclusion

This concludes Lesson 10, the last in the tutorial. Keep any printed material that may help for future reference and rehearse any subjects that may still be unclear. It is recommended that every opportunity be taken to practice laying out reports for presentation.

The following topics were introduced in Lesson 10:

Presentation
- Difference compositor
- Units compositor

Section 9.5 of the User Manual refers to these.

TUTORIAL SUMMARY

Summary

In the tutorial we have set out to involve you in playing an active role in the process in order to learn more quickly. We hope it has been both enjoyable and rewarding and that you are now a confident user of Moneywise.

You should now be familiar with the structure and mechanics of the moneybook, including all its formulae and the use of moneypost to transfer between moneybooks. You will now be able to model, graph and lay out reports in any manner that suits you. You should have a clear insight into more advanced modelling applications aided especially by moneysearch and the bookmarks for management and review of your models.

In summary, you have been introduced to :

The Manager and the Modeller

The Moneybook — like an open ended or loose leaf book containing:

- Contents page
- Key page
- Modelling pages
- Graph pages
- Presentation pages

Moneypost — for transferring information between moneybooks

Moneyprint — to print any or all the pages of a moneybook — Moneywise is self documenting

Moneyfiles — for storing moneybooks, moneypost and moneyprints

Moneysearch — available at all times to examine any or all elements of a model, and their relationships

Modelling formulae — where the columnar format provides unique facilities for financial modelling.

You can follow your own ideas modelling in 'free format' using forms to be filled in but present your results in any form that suits you and your organisation.

If you remain unclear in any area you should go back and rework the appropriate lesson. If all else fails and you are a subscriber to the Moneywise Support Service MSS you can call the **Hotline** service on **01-878 1182** for additional support.

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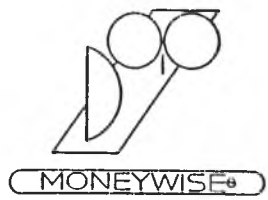

UPDATE

MONEYWISE INSTALLATION NOTES - SIRIUS

Read these notes before installation.

The parts in the Moneywise pack

Registration Card
Reference Card
Manual cover and case
Manual pages
Tutorial pages
Plug key
Disk wallet

Master Disk
Tutorial Disk

INSTALLATION FOR SIRIUS COMPUTER WITH TWIN FLOPPY DISKS

Disk needed

The supplied Moneywise Master Disk.
A write-protected working copy of the MS-DOS Runtime System Disk.
Two additional empty disks.

To obtain the MS-DOS system prompt A>

Switch on the microcomputer.
Insert a working copy of the MS-DOS Runtime System disk into the left hand disk drive and close the door.

The system starts and prompts for the date and time.
(On 20th February 1984 at 5.30pm, for example, type:
20-2-84 [return]
17:30 [return]
for date and time respectively.)

The system then prompts A>