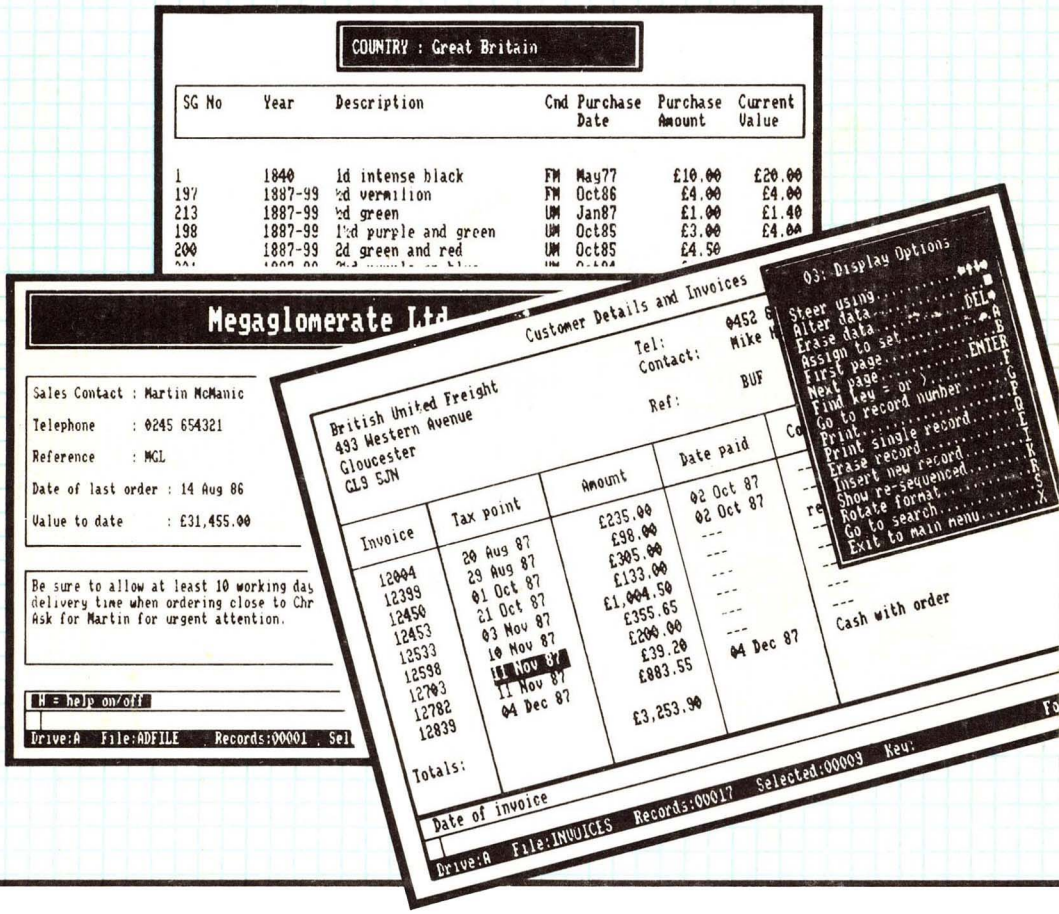
MASTERFILE 8000

DATA FILING AND RETRIEVAL FOR HOME AND BUSINESS FOR AMSTRAD PCW COMPUTERS



Campbell Systems

M A S T E R F I L E 8 0 0 0

1st Edition : January 1987

MASTERFILE 8000 is an information filing and retrieval program for use with the Amstrad PCW series of computers. The program runs under CP/M and can run with the minimum single disc drive configuration.

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Acknowledgement: we thank Arnor Ltd whose MAXAM and PROTEXT software was used to develop, test and document MASTERFILE 8000.

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C O N T E N T S

Welcome to MASTERFILE 8000 !

MASTERFILE 8000 is a further development of a long line of MASTERFILE programs, originating in 1980. The '8000' refers to the PCW 8xxx series of computers for which the program is designed. In the interests of brevity will usually refer to the program in this manual simply as MASTERFILE, or MF8000.

Summary of Facilities

A computer filing system must store, search, display, and print your filed information. It must also permit updates by way of insertions, erasures, and alterations. Information, or DATA as we usually refer to it, is divided into files, records, and fields. Like all filing programs, MASTERFILE also demands that data is so organised. But unlike most other programs, MASTERFILE allows all your data to be of variable length. This means there is no wasted space on the disc. Thus you need only give some thought to the overall volume of data when planning a file.

With MASTERFILE, the way in which data is presented is not geared to the way in which it is stored, and you may devise several different screen views of the same file of data. The display styles can be as diverse as address labels, index cards, and summary tabulations with in-flight column totals. What is more, one may extend or modify the displays at any time.

We have provided some very special display options - the like of which you will not see in most CP/M software. You can embellish your displays with lines, boxes, panels. Even giant characters are possible. A most useful feature is that you can choose your line separation at PIXEL resolution. An interval of 9 or 10 pixels per line is often preferable to the 8 pixels which standard CP/M offers.

A further provision, which we believe to be unique, allows you to sort your displayed data, without changing the file. Thus you can access your records in one sequence, and display in another. Typically, up to 1000 records can be handled in this way.

It is possible to communicate data to other systems, for example to feed names and addresses to a mail-merge word processor. This is called EXPORT. With MASTERFILE one may also IMPORT data (in ASCII form) from other systems.

MASTERFILE files may be KEYED, which means that records are then automatically sequenced by one of the data fields. By means of EXPORT and re-IMPORT, it is a simple matter to generate from one file another file using a different data field as its key. In like manner one may convert a non-keyed file into a keyed file. Almost no matter how you design a file, it is easy to re-organise it as your needs change, without having to re-enter all the data.

You can locate records in a variety of ways. You can just 'browse' through the whole file; or FIND a particular key, or GOTO a particular record number. At a higher level of sophistication, one can SEARCH out a sub-set of the file by comparing the data with some argument. And finally, you can allocate records to a SET for later reference. There are seven

sets available, which can be put to powerful use where composite searches are required.

To change any data, all one has to do is to 'steer' to it using the cursor direction keys and press another special key. It could not be more simple.

Special facilities are provided for handling dates - so that they can be keyed and displayed in 'human' form, yet searched and stored in compact 'machine' form suitable for searching.

A special facility is also provided for handling names so that the title and initials are displayed the way you would want to see them on a label, yet the surname governs searches and sequence.

A most powerful feature is that files may be RELATIONAL. This means that a display can be built which combines data from several records each retrieved from a different file. Thus data common to two or more files need only be keyed once, and any number of records in one file can refer to the same related data in another file.

MASTERFILE is entirely menu-driven, and there is nearly always a menu or prompt on the screen inviting your response. At such times as the program is busy doing something rather than waiting for you, it informs you.

MASTERFILE 8000 Documentation

Together with this Manual, the product comprises a 3-inch disc, containing the program, example files, the Index to this Manual, a Glossary, and a READ ME file.
A complete file list follows.

MASTERFILE 8000 Disc Components

Program:	MF8000.COM MF8000P2.COM MF8000P3.COM MF8000P4.COM MF8000P5.COM
Customise utility:	MF8000CU.COM
Manual index:	MFMANIX.MFC
Stop press:	README.MFC
List of example files:	XFILES.MFC

The example files, listed in XFILES.MFC, are all named XnnNAME.MFC, where nn is the example number, and NAME is a short identifier.

Software licence

Please fill in and return the Software Licence Registration Card as soon after purchase as possible. It will save you time when

using our 'HOTLINE' service.

Purchasing this product allows you to use it for your own purposes as a single user. You are not entitled to use it on more than one machine. If you are in any doubt as to whether you should obtain a multiple user agreement, you must contact Campbell Systems without delay.

You are expected to take a copy of the program for your own security, and your own use. Passing the original, or a copy of it to others, or receiving a copy from others, is unlawful.

Getting Started

MASTERFILE 8000

Version 1.0

Take a working copy of the MASTERFILE 8000 disc, using the CP/M DISCKIT Utility. Instructions on how to do this can be found in the manual which accompanies your machine. Do not un-protect your original MASTERFILE 8000 disc. Keep it only as an emergency back-up.

Load CP/M into the PCW (Side 2 of the System Disc), and when you get the prompt (A>), type MF8000, followed by pressing [ENTER]. This will load MASTERFILE 8000.

You will see that the start screen displays your unique licence number. Record the number on the Software Licence Registration Card. Then press [ENTER], and menu 01 will appear.

From menu 01, press [L] which will take you to menu 02. Press [C] and a list of the files on the MASTERFILE 8000 disc will be displayed. Using the cursor arrow keys, place the cursor over the file README.MFC.

Press [L] for load. README.MFC contains any last minute

additions and corrections which should be used in conjunction with this manual. Display it (menu 01 [D]), then print it ([H] for menu 03, then [P]). Then do the same for file MFMANIX.MFC, which contains the Index to this Manual.

A suggested study plan follows:

1. Load and study the example files. They cover a range of applications, and you may find one which, with a little tailoring, will do what you want.

2. Explore. Once a MASTERFILE 8000 file is on the RAM disc, you can amend, add, or even destroy it without penalty, as long as you don't SAVE the results. Much design effort has been expended in making MASTERFILE foolproof - you should not be able to put the program into a never-ending loop, or get into an unrecoverable situation.

3. Using the MASTERFILE file MFMANIX, consult this manual as questions occur to you.

4. Read Chapter 3, and practice SAVES and LOADS using the example files (preferably onto a spare formatted disc).

5. Practice adding, amending and deleting data directly from the display, again using example files. Explore other Menu 03 options.

6. Then investigate the SEARCH facilities which MASTERFILE 8000 provides.

7. You should then acquaint yourself with the data names, and how to format a display. Then create your own file, with perhaps, 3 data names.

8. Finally, if you wish to use your MASTERFILE data with other packages, the EXPORT and IMPORT functions should be mastered, again using the example files. Try re-keying a file using export/import functions.

9. We have attempted to make MASTERFILE 8000 readily understandable by newcomers to micro computers. The menus and prompts which support your conversations with the computer have been specially designed to help you. These are backed up by this Manual, with its computer-held Index and Glossary, and the example files.

Behind all this is the Hotline Desk, which is manned Monday-Friday during office hours. If you are stuck ,and you feel that you have exhausted all avenues to solve your problem, then telephone or write to

CAMPBELL SYSTEMS HOTLINE
7 STATION ROAD, EPPING
ESSEX CM16 4HA

Telephone: EPPING (STD 0378) 77762

Please quote your Licence Number when using this service.

We now describe the notation used in this manual, and the general rules of dialogue between the user and the program.

Key Notation

We use square brackets to denote a PCW key with a word on it. Thus for example where we refer in the manual to [CAN] we mean the key with the word 'CAN' on it, and not the keys 'C' 'A' and 'N'.

The four cursor direction keys which have a large arrow on them we will refer to as [LEFT] [RIGHT] [UP] and [DOWN]. The key at the centre of these four, which is decorated with a '2' and what looks like a tea strainer, we will refer to as [CENTRE]. These keys are used frequently with MASTERFILE.

Where the program refers to the cursor keys in its messages, it uses graphic arrow characters. Where it refers to [CENTRE] it uses a small solid square graphic character.

There are two 'DEL' keys on the keyboard, and we will refer to them as [DEL->] and [<-DEL].

[ENTER] and [RETURN] keys are equivalent; we always describe [ENTER] but either key may be used with equal effect.

Sometimes it is necessary to hold one key down while pressing another, and to describe this we use the notation as in this example: [ALT E] means hold 'ALT' key and press 'e' key.

Much of this manual needs to describe MASTERFILE prompts, and this is usually be done by using the <.....> style as in this example:

```
< Give name of file to load >
```

Also, the manual must show you what your keyed response might be, and we use a similar indentation but without the < > characters. Quite often we will add comments or explanation; these will be to the right and follow a semi-colon (;); do NOT key these comments. An example of response:

```
LS                          ;to request a save
Myfile [ENTER]              ;your file name
```

In the above example, only 'LSMyfile' and [ENTER] are pressed.

Where we describe a single-key response in our text, we use the square bracket notation for clarity. Thus we may refer to [C] for example, to describe the action of pressing 'c' or 'C'.

Program Modes

In this manual we refer to various 'modes'. A mode simply describes what job the program is doing. We will make frequent reference to the following modes:

```
MAIN MENU: the central control point of the system
FORMAT   : where displays are composed or altered
DISPLAY  : where selected records are viewed
SEARCH   : where you ask the program to search for and
           isolate records
```

Control Panel

While MASTERFILE is running the lower section of the PCW screen shows a multi-purpose control panel comprising three lines :

1st line: The prompt panel, which tells you what is happening, or contains a message (prompt) asking you to respond.

2nd line: Text editor panel, where any text you key is echoed. The small window at the left shows whether or not you are in INSERT mode. An upward arrow here indicates insert mode.

3rd line: Drive letter, file name, and various file statistics.

```
Drive:A  File:X01BOOKS | Records:00107 | Selected:00077  Key:Author        | Format:9
```

'Records: xxxxx' says how many records there are in the file.

'Selected: xxxxx' says how many records are currently selected for display, print and export purposes.

'Key: xxxxxxxxxxx' shows the data name of the key field. For unkeyed files this is blank.

'Format: x' shows which display format is current. 'x' is 0-9.

Menus and Prompts

A MENU is a list of user options from which you may select by pressing an indicated key. The keys are usually shown as upper case A-Z, but in fact the menus will respond equally to lower case letters. In the interests of clarity, we will describe menu letters in upper case in this manual. The larger menus are shown in a rectangular panel, such as:

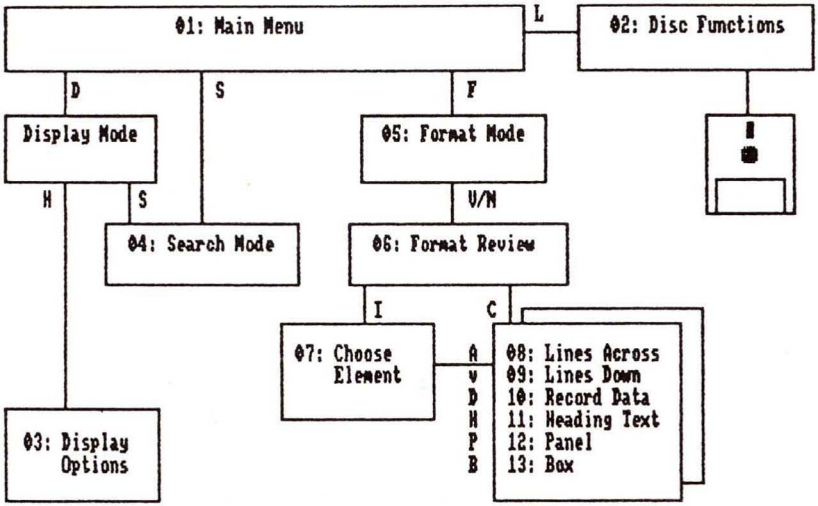
```
06: Format Review

Insert element......I
Change this one.....C
Erase this one......E
Show next...........N
Move menu...........M
Show in stages......S
Printer options.....P
Exit................X
```

All multi-line menus have a number and title; we will refer to them in this manual by their menu numbers. For example we may refer to menu 01 [L] to indicate selecting the [L] option while menu 01 is showing.

Sometimes one menu will overlay another; when this happens, you must respond to the 'nearest' one, not the obscured one.

The way in which the various menus are linked is summarised in the following chart:



Sometimes a reverse-text (black on green) message appears in the 1st line of the control panel. This is a PROMPT which instructs you to do something. Some prompts can take the form of a menu, i.e. inviting one of several keys to press. Such one-line menus and prompts take priority over any other menu in the main part of the screen. Thus, when you press [L] from menu 02, a prompt asks for the name of the file to load. You must answer this question, or back-out before other menu 02 options can be used.

Text Editor

Much of the time, MASTERFILE can be 'steered' just by pressing menu keys. But there are times when you must key text, for example when supplying new data. When this happens, a prompt appears in the prompt panel, but also a CURSOR appears in the edit panel. The cursor is the same block cursor that CP/M itself first offers, and serves to echo what you key and permit you to edit it before committing it, with [ENTER].

All keyed text uses the same editor and the same edit panel. Sometimes the panel starts with text already in it - as when modifying existing data. At other times the cursor alone appears. The maximum amount of text which can be edited depends on the task, but can be as long as 254 characters. The edit window is too small to show all 254 characters at once, but shifts its contents left or right depending on the direction of travel of the cursor. Any attempt to key too many characters is rejected, and a BEEP is produced.

The PCW keyboard tells you if you are in CAPS LOCK, via the red light. The other constant reminder you need is whether you are in insert or overstrike mode. The editor always starts in overstrike mode, but can be 'toggled' to insert mode. Insert mode is signalled with an upward arrow in the small window to the left of the main edit window.

The full list of special control keys recognised by the MASTERFILE text editor is as follows:

[LEFT]	Moves the cursor left
[RIGHT]	Moves the cursor right
[SHIFT LEFT]	Direct return of the cursor to the 1st character
[SHIFT RIGHT]	Advance cursor to the right by window width
[ALT LEFT]	Same as [SHIFT LEFT]
[ALT RIGHT]	Same as [SHIFT RIGHT]
[UP]	Set INSERT mode ON
[DOWN]	Cancel INSERT mode
[DEL->]	Delete the character under the cursor
[<-DEL]	Delete the character to the left of the cursor
[ENTER]	Says that you have completed text edit
[STOP]	Says that you have abandoned text edit
[CAN]	Same as [STOP]

[SHIFT] and [SHIFT LOCK] Same as on a typewriter

When MASTERFILE is Busy

When the program is busy doing something rather than waiting for you, and the task is potentially lengthy, a normal (green on black) message appears in the prompt panel, informing you what is happening. Thus, while loading a file, the message

< -- Reading from disc -- >

is displayed. The prompt panel similarly is used to remind you which data field is being addressed. Do not try to respond to these messages.

BEEP signal

The audible 'beep' sound is used generally to draw attention to some event, such as:

a) The detection of an error, e.g mis-key or disc not in drive.

b) The completion of a relatively long job, such as a search.

If you prefer to have MF8000 operate in silence, then you may customise so that the word 'BEEP' is shown momentarily in the prompt panel instead. See chapter 10 for details on customising.

Dialogue Summary

Menus and prompts are shown black-on-green, and require a response from you. If more than one menu or prompt is visible, respond to the most recent one. If a prompt shows a cursor in the text panel then the text editor is active and you normally terminate your text with [ENTER]. In many situations, [STOP] or [CAN] will abandon or 'back out' of the response. If there is no cursor, then a single key response is usually all that is required, irrespective of the SHIFT.

Progress and information messages may also be shown in the prompt panel, but being green-on-black they do not demand a response.

This Chapter introduces the terms fundamental to an understanding of how filing systems work. This is followed by more particular details of MASTERFILE 8000. There then follows advice on how to plan your MASTERFILE-based application.

Fundamentals

Consider the following pieces of information:

"D J Williams"
"0227 566198"
"24 Acacia Avenue, Epping"

In general, we can call this DATA. In particular, each of the three items we will call a FIELD. Where data fields are associated with each other, such that for example the telephone number and address shown are those of "D J Williams", then one would usually arrange that the fields are stored together. This is like writing them all on the same index card; we call such a grouping of data a RECORD.

Now, suppose that we have another set of data:

"F Thorpe"
"01-507 5561"
"2 The Drive, Barking, Essex"

Clearly this looks similar in structure to the earlier group, and indeed we can regard this as another record of the same FILE. But now consider the following data:

"Nocturne in E flat"
"F Chopin"
"J Lill"
"Philips BBL 7384"

Assuming that this musical data is mutually associated, i.e. the work is composed, performed and recorded as described, then this too constitutes a RECORD, but most assuredly not in the same FILE as the other two examples. We would not intermingle pages of our address book with pages of our music library catalogue.

Thus we can define a FILE as a set of RECORDS of similar structure, each record comprising associated data FIELDS. This definition would apply to virtually any computer filing system. Where computer filing systems differ is in the number and length of the fields permitted, the file capacity, disc storage method, and so on. But the scheme of FILE - RECORD - FIELD is universal.

We now move from the general to the particular, and discuss how MASTERFILE manages your data files.

You will begin a MASTERFILE session either by loading a file from disc, or by creating a new file directly. Throughout the session, the file processed will reside on the RAM disc, which can be thought of as another very fast disc drive. At the end of a session, or when required, you will SAVE the file onto a real disc. Until this stage, the changes you have made to your records cannot be said to be permanent.

We have established that MASTERFILE's unit of disc storage is a FILE. Since the whole file must fit on the RAM disc, the capacity of any one file is limited to RAM disc space rather than real disc capacity. MASTERFILE can use all the RAM disc available on your Amstrad PCW machine.

An individual FIELD can contain between 1 and 254 characters of data, and furthermore, all fields are VARIABLE-LENGTH. This is quite unusual among filing systems. The main advantage of variable-length fields is that there is no wasted space. There can be up to 84 fields per record, and since all fields are variable-length, so too are the records. Maximum record length is about 2K (actually 2047 characters).

Another attribute of MASTERFILE is that not all fields are compulsory. For example, if you need to store extra "Notes" against a few records, then you can do so using a field which need not be present in the other records of the file. This is all in stark contrast to direct-access systems where the maximum field length must be predetermined and allocated for every record. These economies indicate that MASTERFILE manages file space much more efficiently, and therefore effectively than traditional CP/M counterparts.

An overwhelming advantage of MASTERFILE's RAM-based file method is that of sheer speed of search and display. And wear and tear of the disc drive and discs is minimal.

The maximum number of fields in a record is 84, more than enough for most applications. In practice, between 3 and 12 are more usual. Each field may occur only ONCE per record.

Each field is known by its DATA NAME. A data name is a word or short phrase which describes the data, for example "Customer name", or "Address" or "Invoice number". Associated with each data name is a number, called the DATA NUMBER. For example, "Customer Name" may have a data number of '01'. The purpose of a data number is to refer unambiguously to a given data field.

One of the many features of MASTERFILE which sets it apart from lesser filing systems is the ability to present your data in a variety of ways, and in several different ways even on the same file. The term we use to describe the style and content of the displayed data is REPORT FORMAT, although FORMAT will suffice.

Each format is designed and specified by you, the user. You tell the program about the general layout - such as how many lines to reserve for column headings - and then, the data fields which you wish to show, and how they are to be shown - e.g. left-justified or right-justified, column-totalled, etc. Since you can have several different formats used in a file, each format has to be identified with a FORMAT IDENTIFIER.

With menus and cursor controls, you design the display as you wish it to look. The graphical effects available - ruled lines, panels and boxes, allow professional presentation of your data.And you can change them at any time to accommodate changes to the structure of your data (new DATA NAMES, and so on).

Data references and data names are stored in a special record near the start of your file. Report format specifications are also stored as special records, following the data names. In fact, precisely where and how these special records are stored is of no concern to the user, except to impress that when a FILE is saved or loaded, all its associated data names and formats are saved or loaded with the data proper.

The MASTERFILE program is kept as a separate entity from its files. Once the program is loaded, any of its files can be loaded or saved on demand, using MASTERFILE's save/load menu options. When a file is loaded, any file already loaded is instantly forgotten - unless the MERGE or IMPORT options are used. MASTERFILE has its own built-in disc catalogue facility, and offers disc file erase options so that "housekeeping" can be done all from within the MASTERFILE environment. This need not be limited to MASTERFILE files.

Summary of terms described above

FILE	: collection of similarly-structured data records.
RECORD	: group of associated pieces of data
FIELD	: unit of data within a record
DATA NAME	: description of a field
DATA NUMBER	: number used to refer to a data name or field
FORMAT	: specification of how to display your records
FORMAT IDENTIFIER	: number (0-9) which identifies a format

Designing your files

The best start you can make to designing the system for your needs, is to switch off your PCW machine.

Then try to summarise what you want to use the filing system for. Many people find that the discipline of setting down a list of expectations is helpful. So for instance, let us say that you have recently inherited a coin collection, which you have decided to catalogue and, if the fancy takes you, extend.

You will certainly want to record details of each coin - perhaps a coin catalogue number, the year of issue, the face value, the coin's condition. Is there anything else ? What about its current value ? Or if you are extending the collection, do you want to record details of the dealer from whom you bought a given item ?

Only you can decide.

You've done that, so now to consider how you want to display the data. Despite the ease with which MASTERFILE allows you to create and amend layouts, you are advised initially to draw roughs of your plans for displaying and printing. Central to this is the <u>order</u> in which you want your records to appear.

You need also to consider the most helpful order for you when adding, amending or erasing fields and records. For a coin collection this could be a catalogue number, or the year of issue, or, for collections which cover more than one country, the country.

MASTERFILE 8000 files are either keyed or unkeyed. KEYED means that the first data name is taken to be the field on which a file is sequenced. UNKEYED means that the order of the data in the file is as you enter it.

Once a file has been created, it can be used in either of two roles; as a PRIMARY file, or as a SECONDARY (also called REFERENCE or LOOK-UP) file. A primary file is the one LOADed, and whose formats are used when you enter display mode (menu 01 [D]).

A Secondary file is one referred to in the format of a Primary file, which causes an automatic look-up on the Secondary file, to find the requested data. Secondary file facilities, while reducing the volume of keyed data by allowing you to centralise common information, are entirely optional - their use is not obligatory in any way.

KEYED or UNKEYED files. Which to use where ?

Generally, if the sequence of your data matters to you, then you will probably opt for keyed files. This has a number of advantages. It allows all your files to be used as secondary files, if you wish. Display and printed output will be in ascending key sequence. And Menu 03 [F] can be used to locate any point in the primary file.

On the other hand, unkeyed files come into their own when the data you wish to record has no obvious key, and therefore no apparently useful sequence. Example 06 shows an unkeyed inventory of capital assets. New records can be inserted at any point in the file, so you can determine the order in which they are displayed as you insert. If you wish to group unkeyed data within headings, then you can create a file of headings which you then refer to in your format. (See Chapter 9. Relational Headings).

Displaying in more than 1 Sequence.

Unless your file is unusually large, then you can sort the data for display or printing using menu 03 [K].

Larger files must be re-indexed to reflect the required reporting sequence. This is accomplished by exporting the file, specifying the fields in a new order. On importing the exported file, the new key will be the first field encountered in each record. See Chapter 4 for detailed examples of this facility.

Examples to help you

The examples provided have been conceived to give you ideas on how to use MASTERFILE to full advantage.

Example 01 gives a simple realisation of a computer-based book collection. A single file is keyed on Author. This example can be used to illustrate admirably the use of Menu 03 [K] to sort the displayed output (up to 400 records) on any field present in the primary file.

Example 02 shows a more ambitious and powerful rendition of the collecting application. Here, a record collection is displayed using two secondary files - one for composer and one for performer. The primary file is keyed on the record manufacturer's number.

Example 03 is analogous to Example 02 in terms of file use, but the application is different - this time, it's a sales contact recording and diary system. Two secondary files, one for customers and one for products, are linked via the primary file, which is in date of call sequence.

There are other example files provided with MASTERFILE 8000. Full details can be found in the file XFILES.MFC.

Size Considerations

The maximum file size is governed by RAM disc size. For the Amstrad PCW 8256, this is 110K. A primary file on RAM disc comprises three separate CPM files - formats, data and index. All disc space accounting is done in units of 1K (1024 characters).

Typically, 2K needs to be set aside for Formats. Data, both for keyed and unkeyed files, is stored in two parts. In addition to the data keyed, allow 8 characters per record plus 1 character for each data name. Dates are stored in a compact 3-character internal form.

Load the example files one by one, and see the space they take, using menu 01 [M].

If you are using relational files, do not forget to allow RAM disc space for any secondary files which your formats may reference.

When you save a file, the RAM disc components and other system information are stored in the resulting disc file. First, essential control information, such as which format was in use, record totals and so on, head the file. Then the list of data names, followed by the formats, the index, and the data. There may be a slight disparity between the total space on RAM disc and the real disc counterpart. (See Chapter 4 for a fuller discussion of the SAVE function).

This Chapter tells you how to Load and Save files, import and export data for use in other systems, and describes the functions which MASTERFILE provides to assist you in these tasks.

Disc Drives

Amstrad PCW computers have a RAM disc (Drive M), and either one or two disc drives (A and B). With certain exceptions, described later in this Chapter, the RAM disc is reserved for MASTERFILE use.

You can switch between Drives A and B as you wish (see below). The drive currently available for use is always shown in the bottom left hand corner of the Control Panel.

File Naming Conventions

MASTERFILE 8000 runs under CP/M, and file specifications therefore follow CP/M conventions. For those so far unfamiliar with CP/M, a file specification is a means of identifying a file to a program. It comprises three elements:

* A drive identifier followed by a colon [:], e.g. 'A:'

* A filename, up to 8 characters, followed by a full stop [.], e.g. 'MYFILE.'

* A filetype, up to 3 characters, e.g. 'COM'

MASTERFILE does not make use of CP/M password facilities, which also form part of a full CP/M file specification.

Loading and Saving Files

When starting a MASTERFILE session, you may either create a new file from menu 01, or load a file from disc. Chapter 5 gives details on how to create a new file. When you have finished your file changes, you will usually wish to store the changed file on disc.

All files are saved using the filetype 'MFC', where 'MF' stands for 'MASTERFILE' and 'C' means 'current version'. If you are saving a file under the name used to load it, then there will perhaps be a file of the same name and filetype on the disc. In these cases, MASTERFILE renames the old filetype to 'MFP' - 'P' for 'Previous', and then saves the current file using filetype 'MFC'. If there was already an 'MFP' file for this filename, it is erased. By these means, MASTERFILE 8000 automatically preserves the previous version, in case you need it. If you need to keep more generations of previous versions, RENAME the file(s) using a CP/M utility, or use a different disc.

Of course, if there is room, you can maintain files indefinitely on the same disc. However, if you value your data,you should save file back-ups onto separate discs regularly.

Three inch discs are very reliable if cared for, but you must be prepared for physical loss or damage - spilt coffee, accidental reformatting, and so on. Compare the costs of a few extra discs against the effort of rebuilding your data from scratch.

Disc files for loading into MASTERFILE 8000 will generally have a filetype of 'MFC'. If you wish to load a previous version of your file - filetype 'MFP' - you can load it only from the Directory Screen.

On the RAM disc, you will be able to recognise the MASTERFILE database files from the filetype - RDD for data, RDI for index and RDF for your formats. For performance and space reasons, it is advisable to keep the RAM disc as free of non-MASTERFILE data as possible. However, files may be stored there for importing into MASTERFILE.

Getting the Disc Functions menu

Disc and file management facilities are made available to you via menu 01 [L]. This will bring you menu 02, from which most of the file activities are requested.

```
01: Main Menu
-------------------------------------
Load/save and disc functions.......L
Display and Print..................D
Search the file....................S
Select all records.................E
Format maintenance.................F
View/Alter data names..............V
Insert new record..................I
Start a new file...................N
Check RAM disc usage...............M
Quit...............................Q
```

```
02: Disc Functions
-------------------------------------
CAT/DIR...................C
Switch drive A/B..........D
Load a file...............L
Merge/load................M
Import-merge ASCII file..I
Save the file............S
Save partial file........P
Export an ASCII file.....E
Erase a file.......[ALT E]
Main menu................X
```

CAT/DIR - Display a Disc Directory - menu 02 [C]

This gives you a list of all files on the current drive, showing the amount of space occupied by each file, and at the top, the remaining free space.

Then, using the cursor up and down arrows, you can locate a given file, and do the following:

L	;Load the file
M	;Merge the file of your choice into the file you are processing
I	;Import a file
[ALT E]	;Erase a file

These topics are described under their own headings later in this Chapter.

```
Drive A: Free space = 85 K

MF8000  .COM  40 K   X0SADDR .MFC  2 K
MF8000CU.COM   2 K   X0GLIST .MFC  3 K
MF8000P2.COM   1 K
MF8000P3.COM   1 K
MF8000P4.COM   1 K
MF8000PS.COM   3 K
MFMANIX .MFC   7 K
X01BOOKS.MFC  14 K
X02RECSC.MFC   2 K
X02RECSP.MFC   2 K
X02RECSR.MFC   3 K
X03CONTC.MFC   2 K
X03CONTD.MFC   4 K
X03CONTP.MFC   2 K
X04INUC .MFC   2 K
X04INUI .MFC   2 K

Select via ↑ ↓ etc then L=load M=merge I=import [ALT E]=erase   other=as menu

Drive:A  File:        Records:        Selected:        Key:        Format:
```

Check RAM disc usage - menu 01 [M]

This gives a list of all files on the RAM disc, and shows the total free space at the top. You will see three files for the primary file, and two for each secondary (look-up) file. Primary files have a format file (filetype 'RDF') in addition to Index and Data Files.

A black box in the bottom right-hand corner of the display shows the total 'Reclaimable'. This is the space which would be re-used if you were to SAVE the primary file, and then reLOAD it. Further details can be found under SAVE.

Switch drive A/B - menu 02 [D]

For two drive systems, this option will toggle between A and B - you can see the result of the change in the control panel. For one drive systems, use of this option is ignored by MASTERFILE.

Load a file - menu 02 [L]

Loading a file is equivalent, in many ways, to resetting the system. If you were processing another file, and you want to keep it, then it should be saved before loading another file. Under such circumstances, MASTERFILE issues a warning message:

< FILE ALTERED - Do you want to save it ? (Y/N) >

Answer [N] if the file you have been using is of no further use to you. Answer [Y] if you wish either to SAVE the file, or resume processing.

While the loading is taking place, a message will be displayed in the control panel:

< -- Reading from disc -- >

You will notice that the control panel is refreshed with details of the file you have just loaded. In particular, the number of selected records will be the same as when the file was saved, and so will the format identifier.

When you wish to load a file, MASTERFILE will invite you to enter the name:

< Give name of file to load >

Key in the filename (not the filetype), and [ENTER]. If you wish to 'back out' - you've changed your mind, or pressed [L] mistakenly - just press either [STOP] or [CAN]. You will get a beep if you attempt to key more than eight characters.

Merge/Load - menu 02 [M]

This powerful feature allows you to merge one file from disc into the one you are currently using.

The MASTERFILE merge is in two stages. First, the selected file is read from your disc onto the RAM disc, exactly as for the LOAD (described above). Then each record is inserted into the file you are currently using.

There are a number of necessary restrictions governing what can be merged into what.

First, there must be a primary file to merge into. This will either have been loaded via menu 02 [L], or have been created new via menu 01 [N]. An attempt to merge into nothing is ignored by MASTERFILE.

Secondly, the merge file and the primary file must have different names. Thus, one cannot load a file, and then merge it into itself. (But if you save it under a different name after loading, then you can).

Thirdly, each file must have the same number of data names. Usually, the data names will be of the same type (character, date, and so on). The files must both be either keyed or unkeyed. So attempts to merge an unkeyed file into a keyed file will be rejected.

For keyed files, all records are inserted into the primary file in key sequence. For unkeyed files, records are added onto the end of the file, in the same order as they appear on the source file.

While loading the file to merge, the legend

< -- Reading from disc -- >

will appear in the control panel. When the record insertion stage begins, a different legend

< -- Merging -- >

will replace it.

If, while merging, MASTERFILE runs out of RAM disc space, the primary file is always left in a useable state. This is because space is checked before every file change.

Import-Merge ASCII file - menu 02 [I]

The import is a special form of merge, so it needs a primary file into which to place records. In conjunction with the Export option, you can change the key of a file, or read in data from other programs and packages (MASTERFILE III, for instance).

The first prompt

< Give name of file to import >

allows you to enter a full file specification of up to 14 characters. You will then be asked:

< How many fields per import record >

The number you enter must not be greater than the number of fields (datanames) on your primary file.

< Record separators Y/N >

If there is an extra Carriage Return and Line Feed pair between each record, answer [Y]. Otherwise, answer [N]. If you are importing a previously exported file, answer [Y].

MASTERFILE will then merge the import file into your primary file. If there are less fields per record on the import file than on the primary file, then empty fields will be created for those absent from the import file.

Export an ASCII file - menu 02 [E]

There are two major reasons why we may wish to export data. First, we may wish to use our MASTERFILE data with a word processing package such as PROTEXT or TASWORD. Secondly, exporting and then importing allows us to change the key of a given keyed file.

The export dialogue starts with

```
< Give data number, ENTER if all or no more >
```

and the data names associated with the primary file are displayed.

If you wish to export each field of each primary record, in the same order as they are currently, then just [ENTER].

As you will probably recall, the first dataname of a keyed file is always the key field. So if you want to change the key to another field, now is your chance to do so.

Consider a file with three fields, indexed (keyed) by customer. We want to re-index by invoice number, which is let us say, the third field. We do this by exporting a file with the third field named first. The unabridged dialogue is

```
< Give data number, ENTER if all or no more >

3 [ENTER]    ;New key field on import

< Give data number, ENTER if all or no more >

2 [ENTER]    ;Another field

< Give data number, ENTER if all or no more >

1 [ENTER]    ;The 'old' key field

< Give data number, ENTER if all or no more >

[ENTER]      ;No more fields
```

Re-indexing is discussed further later in this Chapter.
The next question is

```
< Data Identifiers ? Y/N >
```

Data identifiers are useful when you are exporting data to word processing packages. MASTERFILE allows you to tailor data to confer maximum flexibility. If you answer [Y], then a data identifier in the form '&A' will prefix each field on the

resulting export file. The '&' represents the character nominated by you in the customising program MF8000CU.COM. '&' is the setting unless you change it. The 'A' is a field identifier generated by MASTERFILE, starting with 'A',next one 'B', then 'C' and so on. If you wish subsequently to import the file, answer [N].

The next question is

< Surname Shuffle ? Y/N >

This sounds like a dance, but it isn't. You will recall that MASTERFILE allows you to use the '< ' to indicate a rearrangement of a field on display. Thus, you key

Spilligan< Mr Mike

which indexes on the surname. On display, the field will appear

Mr Mike Spilligan

The question above is asking which form you would like on the export file. Generally, you will reply [Y] if you wish to export to a word processing package, and [N] if you wish subsequently to import to MASTERFILE.

< Line-breaks: B=Blank C=CR Other=n/c >

To allow you control of address formatting, MASTERFILE provides the line break character, the underscore [_]. This causes an automatic change of line, an invaluable aid for label addressing and so on. To change each underscore to a space, enter [B]. To replace each occurrence with a Carriage Return followed by a Line Feed, an ASCII convention, enter [C]. Press any other key to preserve the underscores. This last option is the one to use if you are going to import the exported file.

< Give name of ASCII export file >

Enter the filename. You may use the full CP/M file specification if you wish (drive:filename.filetype). If you decide that you don't want to write a file, you can escape with [STOP] or [CAN].

MASTERFILE inserts an extra Carriage Return and Line Feed after each record, and an End of File marker (the CP/M standard hexadecimal 1A). This may be of interest to those who wish to use MASTERFILE data in other programs or packages.

Re-indexing a File using Export/Import Functions

If you wish to change the key on which a file is sequenced, you can achieve this by exporting the data, and then importing the exported file. This works because you can export data fields in any order you wish. On import, the first data field met is assigned to the first data name, which is always the key on which a file is sequenced. An example illustrates:

Assume a file with four fields, keyed on customer name. Your list of data names would look like this:

01 Customer Name
02 Customer Address
03 Post Code
04 Purchases to Date

You wish to re-index the file, so that it is in Post Code order.

First, export the file, ensuring that the first field exported is 03 - the Post Code. Then the other fields, for instance 01,02, then 04.

Set up a new keyed file, with the following data names:

01 Post Code
02 Customer Name
03 Customer Address
04 Purchases to Date

Then import the exported file. The new file will be built in Post Code sequence.

Instead of setting up a new file, with its associated data names and formats, you can always SAVE a file which has no records in it. Do this by unselecting all records (Menu 04 - [E] followed by [I]), and then request a partial save (Menu 02 - [P]). You can then LOAD this file before importing, instead of creating a new one.

Save the file - menu 02 [S]

This option writes all the primary file to the disc in the drive currently selected. If you wish to save only the selected records, use menu 02 [P], described later in this Chapter.

A new disc must have been formatted by DISCKIT before you SAVE a file onto it. Files written to by MASTERFILE can be used by any other CP/M programs.

You can also select this option directly following a CAT/DIR operation.

The dialogue starts with the legend

< Give save name or just ENTER >

A filename (up to eight characters) followed by [ENTER] may be given. If the file you are saving has been created from scratch, this is where you give its name. You may also just [ENTER], in which case the name in the control panel will be used instead.

As with the LOAD, you can back out at this point by pressing the [STOP] or [CAN] keys.

Save always writes the disc file with filetype 'MFC'. If there is already an 'MFC' file with the same filename on the disc, it is first renamed 'MFP'. If there is also an 'MFP', it is deleted.

The save reorganises the file as it writes to disc. To understand the process, we need to know a little more about how file changes are applied.

Both keyed and unkeyed files exist on RAM disc as an index file, and a data file. The index record contains the disc address of the data to which it refers. When a change is made to the RAM index file, the change is applied immediately, and if necessary, the complete index file is rewritten. This happens so quickly that you will hardly notice it. Changes to the data file are handled differently. If data is added to a data file, say while replacing a record, then the record is always added to the end of the data file. The related index record is then changed to 'point' to the new data disc address. The old data is not deleted from the data file, but because the index record no longer 'points' to it, to all intents it isn't there.

It is the same with record deletions - the index record is deleted from the index file. Because the data record has nothing pointing to it, it will not be displayed again.

The MASTERFILE save ensures that only those data records 'pointed' at by index records are written to disc.

The amount of space reclaimable in this way is shown when you list the files on RAM disc - see menu 01 [M].

We recommend regular SAVES of your primary file for two reasons. First, it's safer. Accidentally switch off your machine, and the RAM disc is cleared. Secondly, by saving regularly, you free space on your RAM disc for more data, and incidentally, improve the speed at which your data is displayed.

The following messages may appear:

< Done. > ;Save completed successfully

< Disc I/O error >

< Not enough disc space >

Save partial file - menu 02 [P]

This is similar to the full save (menu 02 [S]), except that only selected records are saved. The resulting file on disc can be loaded as a primary file, in exactly the same way as a fully saved file can. In addition, you must enter the filename - just pressing [ENTER] does nothing.

Erase a file - menu 02 [ALT E]

Invoking this option gives the prompt:

< Erase which files >

Type the filename followed by a full stop [.], then the filetype. Successful completion is indicated by the appearance of the CAT/DIR screen. Newcomers to computers will probably find it easier to erase files by calling up the CAT/DIR first, positioning the cursor over the file to be deleted, and pressing [ALT E].

Error Messages

This section lists the error messages which you may encounter while using the MASTERFILE facilities described in this Chapter.

< File not found >

The filename with filetype 'MFC' or 'MFP' could not be found on the drive indicated in the control panel.

< Not a MASTERFILE 8000 file >

The file specified by you did not have a valid filetype.

< Disc I/O Error >

This tells us that something is wrong, but we're not sure what. It is a result of an error while trying to read the data from the disc. It can be caused by trying to use an unformatted disc, or a discless drive, or a physical defect in either drive, disc or both. With a little care, the MASTERFILE user is unlikely to encounter this message.

< Files do not match, cannot merge >

You have accidentally attempted to break one or more of the rules governing the merge. Reread the merge section in this Chapter for details.

< Duplicate file name >

You have tried to merge a file with the same name as the primary file.

< Not enough RAM disc space >

The RAM disc is full, or nearly so. If this occurs during the merge, then the primary file will contain all the records up to the point of failure, which can be used without further ado.

In this chapter we describe how to create a new file from scratch. A central task is to allocate data names to your fields, and decide which data attributes (character, numeric, date) are to be used.

Data Names and Numbers

A data name is a word or short phrase, up to 22 characters, describing a field. For example, we might use data names like:

Customer name
Address
Account ref
Date of invoice
Telephone

Each data name is given a number: 01 for the first, 02 for the second, and so on. We use these numbers for brevity when building screen formats or when exporting data.

Creating a New File

In order to create a new file you must decide whether or not the file is to be keyed, what data fields it is to have, and what the data attributes are. You start with menu 01 [N], which prompts:

< Is file to be keyed ? Y/N >

Reply [Y] if the file is to be keyed; any other response is taken to mean that the file is not keyed. See chapter 3 for a discussion on the merits of keys.

Next you are asked:

< How many data names ? >

Reply with any number 1-84, or 1-63 if using a 25-line screen. MASTERFILE immediately displays them as '(spare)', and invites you to alter them.

Altering the data names

You can alter a data name or its attribute, at any time, via menu 01 [V]. This lists the names and lets you select any name under cursor control, to be re-defined.

The data name review mode is also entered automatically as soon as you have initiated a new file via menu 01 [N] and stated how many data names there are. Initially, every data name is '(spare)' and so you must alter at least one of them to a proper data name. For keyed files, do not leave the first name as reserved.

You cannot erase or insert a data name. But you can re-name one, for example to un-reserve a '(spare)' name just by re-spelling it. You may also change the attribute; but note that this can cause minor problems when changing to/from date [D] attribute if there is already data stored in this field. This is because dates are not stored in ASCII.

If you really need to add more names after a file has been established, and you have insufficient reserved names, then you can make use of export to save the data as ASCII, start a new file with an expanded set of data names, then import the old data. You will have to re-define the screen formats however. Import and export are described in chapter 4.

To select a data name to alter, use [LEFT] and [RIGHT], then press [CENTRE] when the cursor is over the target name. You are then asked:

< Give new data name >

Enter the new data name, up to 22 characters in length. Remember that for a keyed file, data name number 01 is the key field which controls the sequence of the file. Next, supply the attribute when asked:

< Attribute: C (char) or D (date) or N (num) >

Choose [C] if the field is to have character attribute - probably most of your data will be like this.

Choose [D] if the field is a date of the form 'dd mmm yy' in order to take advantage of the date logic built into the system. If the field is also the key field, then a date attribute will ensure the file is in true ascending date sequence.

Choose [N] if the field is pure numeric and you wish to be able to use the numeric format options, such as currency notation, thousands commas, and column totals. If the field is also the key field, then if numeric the file will be in proper numeric ascending sequence.

When you add a new record to the file, data will be prompted using the data names in data number order, but omitting any reserved names. The process of adding or inserting new records is described in chapter 7.

Reserved Data Names

A reserved data name is simply one beginning with an open bracket, e.g. '(spare)'. The space penalty for reserved data is just one byte per record per reserved name. When you create a new file, all its data names are reserved and of course you must un-reserve those you wish to use.

Reserved data names do not prompt for data when building a new record.

There is no direct way to change the number of data names once a file has been started. Hence the wisdom of reserved names.

Data Attributes

As well as choosing a data name for each kind of field, you must also say which of three attributes the field has. The three are:

CHARACTER	probably the most commonly used.
NUMERIC	for quantities and money values.
DATE	for efficient storage and editing of full dates.

All about Dates

Dates are a very important kind of information, and suffer from the fact that people and computers have quite different needs where dates are concerned.

If you need only to record the year (e.g. book publication date, vehicle registration date) then there is no problem; just use two characters such as '86' give the field a CHARACTER attribute.

To hold more precise dates, such as invoice date, renewal date, then you probably need to store day, month and year. And here is the main problem. People are more comfortable with '14th February 1987' while computers find it easier to process '870214'. Consider the task of evaluating a date in terms of whether it is earlier than or later than a particular date; treating the date as a pure number, with the year first, makes the most sense.

MASTERFILE offers a compromise solution. If you give data a DATE attribute then the following processing is brought into operation.

a) When you enter or alter that field the program makes a cursory validation and BEEPs a warning if the keyed data looks unsuitable. The program checks that your text starts with a day number 01 to 31, and that the rest of the text starts with the first three letters of one of the months. If the last two characters are numeric, then this is taken to be the year in this century; otherwise if you omit year, the last keyed year is assumed.

b) Examples of valid dates, and how they are re-displayed:

```
1jan88              01 Jan 88
01 JAN 1988         01 Jan 88
12AUGUST1983        12 Aug 83
14 feb 87           14 Feb 87
31FEb               31 Feb 87  ;takes previous keyed year
25 December 1896    25 Dec 96  ;century ignored
1Separation100      01 Sep 00
```

c) Examples of invalid dates, and how they re-display are:

```
1st January 1983    1st January 1983
Aug 86              Aug 86
1984                1984
32june86            32june86
Aug 1st             Aug 1st
```

d) If validation fails, the program BEEPs but accepts and displays the data exactly as keyed. It is up to you whether you correct it or not.

e) If the validation is successful, the date is converted into binary year month and day. This 'internal' format occupies just four bytes.

f) Internal dates are always expanded on display/edit/export, to the form 'dd mmm yy'.

g) It is easy to search on dates on the basis of later/earlier than.

h) Imported dates are treated just as if they are keyed.

This system is not meant to be rigorous; any month can have 31 days, there is no leap-year logic, it is geared to the present century, and there is no day-of-week logic. Even so, we believe it will suit most applications.

The list of months may be re-defined using the CUSTOMISE UTILITY. We have provided this primarily for non English-speaking users, but you may also wish to show the months all in capitals.

Format Zero

The process of creating or reviewing the data names also generates the standard format, reference '0'. This format shows data as one record per screen, listing data names down the left, and record data to the right. Only the first 28 data names are used in format 0, and only the first 60 or so characters of each field are shown.

It is possible to alter format 0, but not advised since any use of menu 01 [V] will simply undo your changes. The main purpose of format 0 is to enable you to display your data even if you have not yet composed any of your own screen formats.

A new file will show a name of 'NEWFILE' in the control panel, until you save the file onto disc.

Adding records to the file

For keyed or unkeyed files, you may use menu 01 [I] to create a new record and insert it into the file. Each field of the new record is prompted using its data name, and you may key/edit up to 254 characters per field. The current display format is used to display the record as each field is entered. All data fields are prompted, irrespective of whether or not they are shown in the current format. Reserved data names are not prompted.

See chapter 7 for more about record insertion.

Surname Shuffle

The commonest piece of data filed is NAME - especially that of a person. You may wish to file surname, title, initials as three separate fields; but this is cumbersome, and does not lend itself to producing polite salutations on address labels. But it does allow surname to be a meaningful key field.

Consider the name: 'Dr P J Robinson'. If this is the key field, by which the file is sequenced, then Dr Robinson's record will appear among the D's. We could key the name as: 'Robinson, Dr P J', but this would look rather miserable on a label.

MASTERFILE offers a simple solution, called Surname Shuffle. You simple key the name the way you wish the computer to sequence or search it, and use a special character to show how to re-arrange the data on display or export. This special character can be customised using the CUSTOM UTILITY, but we have set it to "<".

Thus we would key our example as:

Robinson<Dr P J

For the purposes of sequence (if key field) and for searching, that is what is used and that is how the name is stored. But when displayed or exported, it becomes:

Dr P J Robinson

The shuffle character can be used in any data - not just surnames, although that is its main use. Only the first shuffle character in a field is used, and it is not meaningful to key more than one.

Related Topics

The way in which data is displayed is dependent not only on the attributes as covered in this chapter, but also on the format options, which are covered in chapter 6.

When you create a new file, you tell MASTERFILE what data names and data attributes you require. Your records are then presented in a fixed style where the data names are listed on the left, and data to the right. This is a very clear style, but limited in the number of data fields which can be accommodated (only 28), and only about 60 characters of text per field.

However, this style - known as 'format 0' - is merely a default format. You can compose up to nine more formats, with a huge choice of effects. These effects is summarised below:

a) The line spacing can be set at pixel resolution.

b) The number of lines allocated per record can be anywhere from 1 to 28, and MASTERFILE will present as many records at a time on one screen as will fit.

c) Fixed headings and notices can be erected anywhere on the screen.

d) Boxes, horizontal lines, vertical lines, and panels can be drawn anywhere above the control panel. Indeed, we used MASTERFILE format mode to produce the menu map illustrated in chapter 2.

e) Data fields can be positioned anywhere within the 'Data Zone' defined by step b). You can be selective about which fields to display. You can specify the width and depth of each field's display area, whether left or right justified, or even centred; whether numeric editing is required, and if so 0 or 2 decimal places, leading symbol, and thousands commas. You can also request column totals on a field-by-field basis.

f) There is even an option to show headings or data at double height and width, and whether green on black or vice versa.

g) Where data is absent in a record, one may specify some filler text.

h) For printing purposes, one can specify forms depth, left margin, draft or letter quality, elite/pica/condensed, line spacing, and language set.

Best of all, the positional effects are controlled visibly, making use of the cursor keys to move effects around the screen or to change their shape.

Formats created by the user are numbered 1-9. Formats can be altered at any time, and they can be copied and erased. You may even amend format 0 but format 0 cannot be erased.

Formats are saved as part of the file, and so may be used immediately upon loading the file. They may be altered at any time.

Format Mode

Menu 01 [F] takes you into format mode, where you may design, review and amend a format. The initial format menu is as follows:

```
05: Format Mode
New format.....N
View/Alter.....V
Copy...........C
Erase..........E
Exit...........X
```

There are many format menus, but they all have in common [X] to exit to the previous menu - all the way back to the main menu if you press this key enough times. [X] usually indicates that you have finished a particular task.

Using the Cursor Keys

Many of the effects you put into a format are moved and shaped using the cursor keys [LEFT] [UP], etc. and whenever these keys are active the prompt message will list them. However, what the messages do NOT show is that when used with [SHIFT ...], the movement is magnified. Thus you can use the [SHIFT LEFT] etc for rapid coarse adjustments, and then release the SHIFT for fine adjustments.

Creating a new Format

Menu 05 [N] initiates a new format, and your first response must be to supply its format identity 1-9. (You cannot create format 0 this way.)

Some attributes of a format are unchangeable, and are chosen at this stage; so choose well as there is no direct way to alter them. These attributes are:

a) Line spacing, number of pixels per screen line
b) Position and size of the DATA ZONE

Screen Line Spacing

When creating a new format, you are asked to state how many pixels per line you wish to see on the screen. This affects all headings and text above the control panel when this format is to be used. The prompt is:

< Give pixels per line (8-15) >

If you reply just [ENTER] then 8 pixels are assumed. Note that the screen pixel spacing has no effect on text printing.

Record Data Zone

The DATA ZONE is the space reserved on the screen in which to display one record. Once you have given the pixels per line, the default data zone is drawn as a wide box on the screen. This box shows the part of the screen reserved for displaying the first record. Also, a panel shows three statistics relating to the zone box.

```
Number of heading lines       : 02
Number of lines per record    : 01
Number of records per screen  : 26
```

The number of heading lines is the number of clear lines above the data zone box. The number of lines per record is how many lines of text can fit in the data zone box. The number of records per screen says how many such data zones will fit above the control panel.

The depth of the data zone starts as a single line, with two clear lines above it. If you increase its depth, then it grows in steps equal to the pixel line spacing already chosen.

You can adjust the box using the cursor arrow keys, as prompted. The box can be steered up and down using [UP] and [DOWN], and it can be made deeper or shallower using [RIGHT] or [LEFT]. At every movement, the zone statistics are updated. Once you press [ENTER], the data zone is committed, and there is no way to get back without erasing and re-starting that format.

Apart from determining how may records per screen, the data zone has other significance as follows:

a) Headings (fixed text) can be displayed anywhere, but if displayed in the data zone then the headings are repeated in each data zone on the screen if more than one records share a screen. Headings placed above or below the first data zone are shown only once per screen.

b) Headings below the data zone are displayed, but do not contribute to any text printed output.

Once the data zone has been defined, the format is created but not yet of use, since it needs to have ELEMENTS inserted. An element is a heading, or data from a record, or a graphic effect such as box or a set of ruled lines. The way to create these elements in a new format is exactly the same as inserting a new element into an existing format. We will shortly describe this process, but first we describe how to review a format.

Reviewing a Format

Use menu 05 [V] and give the identifier 0-9 to view/review an existing format. What this does is to show all the elements of the format, except that usually just a row of 'XXX...XXX' appears where record data would appear. Menu 06 'Format Review' controls which element you wish to alter, and is central to the process of building or amending a format. Once a new format has been initiated and its data zone set, menu 06 will appear automatically and you may insert your first element.

```
06: Format Review

Insert element......I
Change this one.....C
Erase this one......E
Show next...........N
Move menu...........M
Show in stages......S
Printer options.....P
Exit................X
```

Identifying Elements

Whilst you need to see the whole display format, you also need to be able to identify and access individual elements in order to change them, to erase them, or in order to govern where the next element is to be inserted. The sequence of non-overlapped effects is not important, but is critical where they overlap, such as with effects drawn or written over panels. Clearly the panels must be painted first.

Menu 06 [N] pressed repeatedly simply 'blinks' each element effect in turn. Pressing any key not listed in menu 06 simply blinks the current element but does not advance - which you may find useful. After the last element is shown, [N] repaints menu 06 and the next [N] starts again by blinking the first element; in other words, [N] operates in a cyclic manner.

Where an data element is reached, its data name is shown in the control panel, together with its start column and width. For an external data element the target filename and data number are shown instead of data name.

In a complex format with overlap problems, it is useful to see the build-up of elements one by one. For this, use menu 06 [S] then [N] etc.

Altering an Element

To alter an element, you must identify it. If in doubt, press [ENTER] at menu 06, and the current element is flashed. Use [N] to locate the target element, then [C] to get into 'change' mode for the target element. You then follow the resulting menu options for whatever kind of element is being altered; these options are discussed below.

Erasing an ELement

To erase an element, identify it as just described, then use menu 06 [E], and [Y] to confirm.

Inserting an Element

Use menu 06 [N] if required to determine where in sequence you wish to insert an element. If you have just reached menu 06 from menu 05, the next use of [I] will start a new last element. When ready, use menu 06 [I] to start a new element. This immediately offers menu 07 from which you choose which type of element you want. Menu 07 is as follows:

```
07: Choose Element

Record data.........D
Heading text........H
Box.................B
Panel...............P
Draw lines across...A
Draw lines down.....V
Exit................X
```

Once you choose the element, a provisional element of that type is placed on the screen immediately, and a further menu invites you to adjust it to the size and position etc that you require.

Graphic effects such as boxes and panels are drawn and moved in such a way as to minimise 'trails'. Data and headings can leave empty spaces when moved, and can temporarily obliterate the menu. But this does not render the menu inactive. Sometimes it will be necessary to re-paint all the elements before the true result can be assessed. The menus themselves can get in the way, but we have provided a means to move the menu position.

The individual types of element are now covered in detail.

DATA Element

Every format will include at least one data element, since this is what causes data from your file to be displayed. You use menu 07 [D] to create a new data element. You are then asked several questions, starting with:

< External data ? (Y/N) >

Reply [N] if the data you wish to display is from the primary file; or [Y] if the data is to be retrieved from a READ-ONLY (external) file.

If reply [N], then you asked for the data number of the target data field. To assist you, the screen shows you the list of data names.

For reply [Y] the data is external and you are asked for the name of the read-only file; just give the main name, do not give the file type or drive identifier. Then you are asked for the data number - you are not offered any data names, so you are expected to know the data number.

With data number established, the custom menu then appears:

```
10: Record Data
---------------------------
Move................M
Paragraph size......P
Colour..............C
Default text........T
Size................S
Attributes..........A
Exit................X
```

The provisional data shows as 'XXXXXXXX' at the top right corner of the data zone.

The first thing you would probably do is to is to use [M] to move the element to where you require it. All four cursor keys can then be used, optionally with SHIFT for rapid coarse movement. Note that MASTERFILE will not usually let you move outside your data zone. Terminate [M] action by using [ENTER]; this convention is used with all the element position/shape changes.

The next thing is to do is to set the PARAGRAPH size, using [P] etc. Any data can be given a window of any width and depth within the data zone.

Record data can be displayed as either green on black or the inverse of this. Menu 10 [C] will toggle the colours from one state to the other.

Where a record does not have data present, you can substitute a 'default' text. If you do nothing, this text is '---', but you can alter this using menu 10 [T]. Note that default text does not affect file searching.

It is possible to make data appear in large (double width, double height) characters. Menu 10 [S] toggles the size between normal and large. If there is no room in the data zone to accommodate then [S] is ignored. Note that text output of large characters is not possible; however, screen dump printing will always work.

Display Attributes

Menu 10 [A] invites you to examine or change the display attributes of the data. If you do nothing, then data is left-justified within its 'XXXX...' space, and treated as simple text. The first prompt is:

```
< Justification is L.  (Left/Right/Centre) >
                  or R or C
```

Reply [ENTER] to make no change, or else use [L] to left-justify, or [R] to right-justify, or [C] to centre the data text. Other attribute prompts also interpret [ENTER] as 'no change'.

The next prompt is:

< Leading symbol is £. Choose or ENTER >
e.g.

This causes numeric data to show a leading symbol - e.g. £ or $. Use [ENTER] for no change, or whatever symbol key you wish. If you do supply a symbol, then this is used in place of 'X' to show where the data goes.

Numeric data can be shown as integer or to two decimal places, via:

< Two dec.places = N: (Y/N) >
or Y

Another refinement offers thousands commas, so that the data '1234567' can be made to display as '1,234,567'. The prompt is:

< Thousands commas = N: (Y/N) >
or Y

Finally, numeric data can be column-totalled. This means that after displaying the last selected record, any numeric data with the column total attribute will yield an algebraic total. The prompt is:

< Column Total = N: (Y/N) >
or Y

Relational Grouping

When data is retrieved from a read-only file - i.e. using the 'external' option of the data element - it can be displayed anywhere in the data zone. But unlike other fields, it may also be displayed above the data zone, in the part of the screen normally reserved for headings. You will see that the 'XXXX...' of external data can be steered all the way to the top of the screen.

The significance of this is that such external data can be regarded as a variable heading. For a full discussion of this and its uses please refer to chapter 9.

Heading Element

Your display can include fixed text anywhere on the screen. This might be a title, or column headings, or other labels to make your data clearer when viewing it. Use menu 07 [H] to start a heading. This places a single asterisk at top right of the screen, and offers menu 11 as follows:

```
11: Heading Text
Move................M
Edit................E
Colour..............C
Size................S
Exit................X
```

The '*' is simply a one-character heading; now you must use menu 11 to convert this into the desired heading. First, use menu 11 [M] to move the heading where you want it, using the four cursor keys in the usual way, with SHIFT for larger steps. Use [ENTER] to exit the [M] state. Next, use menu 11 [E] to edit the heading. This brings the heading into the edit panel where you may change it at will.

Note that a heading cannot span more than one screen line; but you can raise any number of heading elements.

Other options via menu 11 are [S] to switch between normal and large size; [C] to switch between normal and reversed colours, and [X] to end work on this heading element.

Note that if a heading is placed in the first data zone, then it will repeat for every record on the screen when in display mode. But in format mode, only the first data zone is illustrated.

Graphic Elements

You may embellish your display with several graphic effects - but note that these will not be reproduced on printed output in normal text mode. The graphic effects are drawn lines across or down, rectangular boxes, and filled rectangular panels.

Drawn Lines Across

One or more parallel lines can be drawn using a single element, started by using menu 07 [A]. This draws a tentative line and offers menu 08 as follows :

```
08: Lines Across
Pattern.............P
Length..............L
How many............N
Spacing.............S
Colour..............C
Move................M
Exit................X
```

Use [M] and cursor keys to move the line around the screen.
Use [L] to adjust the length of the line.
Use [N] to adjust the number of parallel lines.
Use [S] to adjust the spacing between the lines.

Use [P] to adjust the density of the drawn lines. They can be solid, or feint, or dotted. [P] itself switches the pattern without further prompts.

Lines are usually drawn on a black background. But you may wish to draw them over a green panel, such as MASTERFILE does with its menus. To do this you must reverse its colour, using menu 08 [C]. Note that the effect of option [C] is not seen until you exit via [X].

Drawn Vertical Lines

Use menu 07 [V] to create a tentative vertical line. Menu 09 is then offered, letting you adjust this element in a manner very similar to the lines across we have just discussed. In fact, the only difference is that menu 09 [T] selects thick or thin lines, rather than a dot pattern [P].

```
09: Lines Down
Thickness.........T
Length............L
How many..........N
Spacing...........S
Colour............C
Move..............M
Exit..............X
```

Note that where two or more vertical lines are drawn by a single element, the maximum spacing is about 30 characters. For wider spacing you must use separate elements.

Box

Whilst you can build a box using a two pairs of drawn lines, there is a more direct method via menu 07 [B]. This draws a tentative box and then offers menu 13 below:

```
13: Box
Size..............S
Move..............M
Colour............C
Exit..............X
```

Use menu 13 [M] to move the box around the screen under cursor key control. Use [S] to adjust the width and depth of the box.

Just as with drawn lines, the colour can be switched via [C], and again the effect is not visible until [X] is used to exit menu 13.

Panel

A panel is just like a box, but filled in. Menu 07 [P] creates a tentative panel, and offers menu 12 as follows:

```
12: Panel

Size................S
Move................M
Colour..............C
Exit................X
```

Adjustments are identical to those employed with boxes discussed above.

Printing Options

The print formats are generally taken from the screen display format, except that only normal-size headings and data text are shown, and any reverse-colour text appears normal on paper. Unless you tailor the print parameters, the output will be in Elite (12 characters per inch across), six lines per inch vertically, draft quality, and no page boundaries. But every format has a print parameter table which you may alter.

To review these parameters use menu 06 [P]. This not only shows the present settings, but invites changes purely under cursor key control. The settings are shown as follows:

```
Printer Options

Forms depth     Inf
Left margin      00
Continuous
Lines per inch 6
Draft
Zero slash       -
Elite            ♦
Condensed        -
Emphasised       -
Double strike    -
Enlarged         -
UK
```

Use [UP] and [DOWN] to select a parameter, then [LEFT] and [RIGHT] to alter it. Use [ENTER] only to exit to menu 07.

Word Processing

You may notice that a data item can be several lines deep. Indeed, since a single data field can hold up to 254 characters we must allow it to be displayed in several lines. MASTERFILE automatically uses word-wrap logic to minimise word breaks. Thus when keying your data you need not worry about how the data will be displayed. In general, MASTERFILE will start a fresh line rather than break a word. A word is considered to end at a space; other punctuations by themselves do not mark the end of a word. The following would be treated as one long word:

```
Baubles.Bangles.Beads(Glass)
```

If you have not allowed sufficient space to display the field, MASTERFILE displays as much as it can.

There are cases where you may wish to start a fresh line within a data field - an address would be typical. To allow this, MASTERFILE recognises a special LINE-BREAK character. This is the underscore '_' character, but you may choose a different character via the CUSTOMISE utility. The line-break character is visible only in the edit panel; on re-display it is invisible. Thus for example, if we key the data:

```
Sugar 2 oz_Two egg yolks, whisked lightly_Butter 4 oz
```

This if displayed in an area 3 or more lines deep, and sufficiently wide, will be displayed as:

```
Sugar 2 oz
Two egg yolks, whisked lightly
Butter 4 oz
```

If displayed in a wide space just 1 line deep, it will appear:

```
Sugar 2 oz Two egg yolks, whisked lightly Butter 4 oz
```

If displayed in a single line just 20 characters wide, it will appear:

```
Sugar 2 oz Two egg y
```

The most common and useful application of line-breaks is in addresses, for example if we key the data:

```
7 Station Road_Epping_Essex CM16 4HA_England
```

This will, given sufficient space, display (and print) in the form:

```
7 Station Road
Epping
Essex CM16 4HA
England
```

With the centre and right-justify options, the same data can show as:

```
7 Station Road                    7 Station Road
    Epping          and                 Epping
Essex CM16 4HA                    Essex CM16 4HA
   England                           England
```

Numeric Data

Data given the numeric attribute is not word-wrap processed, but does obey the rules of left/right justify and centre. More importantly, any non-numeric characters in numeric-attribute data are ignored. A negative sign is acceptable if it is the first character, and is then taken algebraically for the purpose of search and column-totals. To understand the rules, we give a few examples of keyed data showing how it is treated assuming a numeric attribute:

Keyed	Shown as integer	Shown as 2 dec.pl, rt-just	
35mm	35	35.00	;no round-up
$100.128	100	100.12	
-49.336	-49	-49.33	
48 @ $1.50	481	481.50	;so beware !
PCW8256	8256	8256.00	
David	0	0.00	;what else ?
+10	10	10.00	
20-3*4	2034	2034.00	;no expressions

Money values are best keyed as pure numbers - let the format insert currency symbols. Likewise, it is not necessary to key zero pence since the data '65.00' and '65' will yield identical results.

Blank Characters

MF8000 always strips leading and trailing spaces from record data, at the time you key it, alter it, or import it. This avoids mis-matches and minimises the file size.

There may be any number of embedded spaces within a field, but there is never any point in having two or more consecutive spaces since the display logic reduces them to single spaces on display or print. The only way to create large gaps in a field is to make use of several line-break characters.

The same arguments do not apply to static headings, which can include spaces anywhere. You might for example enter column headings as one wide heading or as several individual headings.

Display mode is reached via menu 01 [D] or menu 04 [D]. From here you view your data, make changes to it, and request printed output. You can also sort your data. Selected records only are displayed.

In general, what display does is to fill the screen with as many records as will fit, and then wait for your further directions. Your choice is quite a large one - but MF8000 does not automatically offer a menu since the screen is already rather full. The 'Display Options' menu 03 can be pulled down via [H], but the menu responds whether visible or not. Here it is:

```
03: Display Options

Steer using.............←↑↓→
Alter data..................■
Erase data..............DEL←
Assign to set..............A
First page.................B
Next page.............ENTER
Find key = or ).........F
Go to record number......G
Print.....................P
Print single record......Q
Erase record..............E
Insert new record.........I
Show re-sequenced........K
Rotate format............R
Go to search.............S
Exit to main menu........X
```

The target record

This means 'the record we wish to alter/erase/print'. If there is only one record on the screen, then this is the target record. If there are two or more records on the screen at one time, then the target record is the one showing a field cursor.

The Field Cursor

A field cursor is a reverse colour display of a field position. Normally this will be a bright green bar. Display functions [A] [E] [Q] and [I] must usually refer to a target record, and if used without a target record MF8000 warns with a BEEP and then simulates [RIGHT] thus offering a target record.

When a cursor key is pressed, a field cursor normally appears; this identifies the target record and field.

[UP] and [DOWN] move up or down by one record within the currently displayed screen. [UP] and [DOWN] are not useful except where there are several records per screen. [RIGHT] and [LEFT] move the field cursor to the next or to the previous field within the target record. The purpose of the field cursor is to show which data is to be altered, or to identify a target record. You will see that the cursor cannot be moved over headings or relational data since they cannot be altered.

Wherever the field cursor appears, the data name of that field appears in the prompt panel - in normal colour. As [LEFT] and [RIGHT] are used, so this data name is constantly replaced, telling you exactly which data is under the field cursor.

The following figure illustrates this:

130-138	1938-44	Set of 13, blocks of 4	UM	Sep83	£6.00	£12.00
130-43	1938-44	Set of 18	UM	Feb85	£42.00	£42.50
143	1938-44	£1 purple and black/red	UM	Mar80	£12.00	£25.00
143	1938-44	£1 purple and black/red	FM	Dec80	£4.00	£11.00
144-57	1945	Set of 14, blocks of 4	UM	Feb81	£40.00	£66.00
144-57	1945-7	Set of 14	UM	Dec79	£9.35	£16.50

Description

Drive:A | File:EXSTMPS | Records:00032 | Selected:00032 | Key:Country Key | Format:1

Altering Data

[CENTRE] is used to alter whichever field is lit by the field cursor. This causes the data name to be shown in reverse - i.e. it becomes a prompt and invites you to edit the data which has been pulled into the edit panel. All the editor functions may now be used, and the data can be extended up to 254 characters. [STOP] or [CAN] will back out, in case you pressed [CENTRE] by mistake. Otherwise, on completion of the edit the record is re-displayed with the changed data in place.

If you alter the key field, MF8000 has to do rather a lot of work since it has to reposition the altered key to maintain file sequence. After doing this, the display is resumed with the altered record at the top of the screen.

You cannot alter a field unless the format includes it.

Assigning to a Set

Display mode [A] asigns the target record to one of sets 1-7, which you choose in response to the prompt:

< Assign to set 1-7 >

Press any key 1-7, which sets on the corresponding SET flag in the record. These flags are fully explained in chapter 8.

Erasing Data

To erase data under the field cursor, just press [DEL->]; there is no back-out from erasure at the field level, so use this key with care. You cannot erase the key field, since a keyed file must have key data in every record.

Erasing a complete Record

The target record may be erased completely by using [E] but must be confirmed using [Y] in response to:

< Press [Y] to confirm erasure >

If you press [E] by mistake, back out by pressing any key except the [Y].

Inserting a New Record

There are two ways of placing a new record into a file; menu 01 [I] and display mode [I]. For keyed files, these have the same effect since a new keyed record will only be inserted at one place. If there is already a record of the same key, the new record is placed after the old one(s).

For unkeyed files, menu 01 [I] inserts the new record at the end of the file, while display mode [I] inserts it after the target record. Thus for unkeyed files you can have total control of the sequence of the file.

When a new record is started, the display shows just an empty record in the current format. Each data field is prompted in turn, whether shown in the current format or not. You may enter data at any field, or omit it using [ENTER] only.

On completion of data entry, display mode is resumed at the record just entered; this makes it easy to insert several consecutive new records in an unkeyed file since an immediate [I] starts another new record after the one just created. For keyed files the position of new records is purely a function of key values - one may not choose 'where' to insert a keyed record.

Switching Formats

The display can be switched to another format using [R] when in display mode. If the current format is '3', [R] will attempt to display format '4' if it exists, or else try '5' and so on. After '9', format '0' is taken. When switching to a new format, the display resumes with the target record.

Interrupting the display

Where more than one records per screen are shown, it is possible to interrupt by pressing any key. Thus for example when switching through several formats one need not wait for each screen to fill.

Browsing

It is often useful to 'browse' through a file, and where more than one screenful of records are selected there are several useful ways of re-positioning to a different part of the file.

To move to the next page, use [ENTER].

To resumes the display from the first selected record, use [B].

GOTO

You may use [G] to 'GO TO' a specific record by giving its selected number. If all records are selected, then this is the same as the absolute number. But if not all records are selected, the number is relative to the selected sub-set file. [G] yields the prompt:

< Go to selected record #... >

Reply with any suitable number. If the number is too large then just the last record is displayed.

FIND

For keyed files, you can use [F] to 'find', where you are asked:

< Give key to find >

Reply with any key, and MF8000 hunts for the first record equal to or higher than this key, and resumes the display from this record. For example, to display starting at the records whose key begins with 'N' or higher, use:

```
F              ;find
N [ENTER]      ;equal to or higher than this
```

The key is case-specific, in that 'A' to 'Z' are lower than 'a' to 'z'. Only the key field is searched. If you need to locate records based on other data fields, you must make use of search mode.

You may also use [F] in the context of a sorted display. This then works even for unkeyed files since the 'find' searches on the temporary file index created by the sort. The sort function is explained later in this chapter.

Leaving Display Mode

Use either [X] to exit to main menu 01, or [S] to exit to search mode, menu 04. Also, inserting a new keyed record via display mode [I] ends in main menu.

Printing to the PCW Printer

Printed output is of three types:

List of Data Names

This is simply a text copy (in Elite) of the data names and attributes as listed via menu 01 [V]. This is discussed in the chapter 'Data Names'.

Graphic Screen Dump

At any time where MF8000 is awaiting a key response (even while using the text editor), the system will respond to the three-key key combination of [ALTER EXTRA PTR]. In fact, this is a PCW firmware option which you may not have noticed before - and we cannot be sure that all PCW models support this.

The screen dump is a dot-by-dot snapshot, and many of the illustrations in this manual were produced in this way.

To terminate a screen dump prematurely just hold down [PTR].

Print Displayed Records

This is the main MF8000 print function, and is invoked by [P] or [Q] when in display mode.

[Q] prints just the current record, specifically the contents of the target data zone. Headings outside the data zone are ignored.

[P] prints all selected records starting with the current record or the top displayed record. Printing may be abandoned by pressing any key. The use of the paper will be governed by the Printer Options for the current format. Format mode menu 06 [P] is where you set these options, and is discussed more fully in the chapter 6.

Lines, boxes, panels and giant-size text are not printed, and inverse text appears in normal style.

Unless you have specified 'Inf' in the printer options, printed output is in pages where each page starts by repeating any headings above the data zone. 'Inf' means 'infinite' and suppresses page treatment. Either way, forms may be continuous or single-sheet.

Page/Line Numbering

Any heading text which starts with a number sign '#' is taken to mean 'print a number starting with 1 and add 1'. Thus to effect printed page numbers, place a heading of '####' above the data zone. You can of course place a separate heading such as 'Page' beside the special heading. 'Page ####' is not effective however, please note.

If the '#' heading is placed in the data zone, then it will serialise every record, and may therefore be used as a universal line or record number.

The '#' heading will not be translated onto the screen - only on paper.

Record Numbers

A heading of '%%%%' is taken to mean 'Display/print the absolute record number'. Use it only within the data zone. Note that unlike '####' it does not necessarily start at 1, and there may be gaps depending on which records are selected.

Printing notes:

a) Except for 'Inf', each page ends with a Form Feed. This applies to the last page even if it is not full. The number of records printed on each page except where 'Inf' is used, is INT((FD-HD-6)/DZ) where:

FD is the specified forms depth no. of lines,
HD is the number of lines reserved for headings above the data zone,
DZ is the number of lines in one data zone.

b) Six clear lines separate each page, where the forms are continuous.

c) Except for High Quality, text printing is reasonably fast and the PCW printer works bi-directionally. But some special characters cause the printer to work slowly and uni-directionally. The presence of a pound-sign in a line seems to have this effect. We don't know why !

d) Beware using 10 characters to the inch across (Pica, = not Elite) or Enlarged options since they can cause line overflow and hence page overflow if any line goes beyond column 80. Short lines do not overflow since MF8000 does not print trailing spaces in a line. We recommend Elite for most work, since it does not cause line overflow as long as left margin is 0.

e) Some printer options over-ride each other - for example, Elite prevails over Condensed and Condensed prevails over High Quality.

f) The PCW printer controls may be used - temporarily obscuring the bottom part of the MF8000 control panel.

Sorting the file

It may be desirable to display or print selected records in a sequence other than that of the natural key. Or perhaps a file is un-keyed and you wish to show it sorted by one of its fields.

A fast and powerful sort function is provided via display mode [K]. This lists the data names and invites:

< Give data number to sequence by >

You enter any valid data number (but not 1 for keyed files) and then you are asked for the length of key:

< Give key length 1-25 >

This tells MF8000 how much of the data to take for its compare logic. A small value will give a less precise sort but will allow a larger sort capacity - we will discuss this shortly. If you reply with just [ENTER] then it assumes the previous used sort key length.

MF8000 informs you it is sorting and there is a pause of a few seconds while sorting takes place. On completion of the sort, the display is resumed but now in ascending sequence by the given field.

Certain functions are suppressed while the display is shown sorted. These are [E], [G] and [I]. Also, you cannot alter the natural key field while sorted. The print function [P] works, but always starts at the first (lowest sort key) record. Leaving display mode, via [X] or [S], will abandon the sorted sequence. Also, using [K] then [ENTER] will resume the natural display sequence. You may sort as often as you like, subject to the limitations discussed below.

The 'find' function [F] may be used with a sorted display, whether the file is keyed or not. While the sorted sequence operates, [K] assumes that the target field is the same field by which the records are sorted.

The sort works by extracting the first 'n' characters of the target field, where 'n' is the key length you specified. Numeric fields will be treated as character, so that '1','100' and '10000' will all sort before '2', for example.

Sorting requires RAM and the space reserved for this is from 55296 to the top of the TPA. This will normally be about 7680 bytes, but may be less where a SUBMIT file is in use or RSX code installed. The sort capacity is (S/(K+2)) records, where S is the RAM space and K is the key length. For example, if K is 7680 and key length is 5, the capacity will be 1097 records. If there are more records selected than can be accommodated by the sort, then MF8000 will simply sort what it can and warn with the message:

< Sort limited to xxxx records (press any key) >

To display or print more records then you must either reduce the key length or else sort in batches. For example, in a large file where you wish to sort by 'Name', isolate all names beginning 'A' to 'D', sort and print. Then repeat for the 'E' to 'H' and so on.

Sorting has no effect on the file's physical sequence; a temporary alternative file index is built in RAM. For a permanent change of sequence, use the re-index technique as described in chapter 4.

We have already seen how to browse through a file in display mode using FIND and GOTO. With larger files the browse method can be cumbersome; so instead one can ask MF8000 to make a logical inspection of the records and pull out just those records of interest for the job in hand. This process is called SEARCH and is initiated either from menu 01 [S] or from display mode [S]. The result of a search is that the records you have found are SELECTED, while the rest are left UNSELECTED. The selected records may then be displayed with relative ease.

For example, one can use search to find all the Chopin titles in your music collection, or all addresses containing 'London'. As we will see, one may even select records on a combination of criteria.

The reasons for selecting particular records need not be purely for display convenience. The selected records may be printed, exported, or even saved as a new file.

Search Menu

Menu 01 [S] or display mode [S] both enter Search Mode, producing the Search menu 04 as illustrated below. The examples in this chapter all presume to start with this menu in view.

```
04: Search Mode

Select by compare........C
Select by set............S
Select every record......E
Invert select status.....I
Assign selected to set...A
Clear one or more sets...Z
Show set counts..........#
Describe a set...........T
AZ=az ? YES..............U
Go to display............D
Go to main menu..........X
```

Search via Data Compare

The essential ingredient of a search is usually a comparison of record data with an ARGUMENT. For example, to find all records in which field AMOUNT is greater than 100, one would key:

```
C                          ;Compare
AMOUNT>100 [ENTER]         ;Expression
D                          ;Display the selected records
```

In this example, the data being examined in each record is AMOUNT, and the argument is 100.

The symbol between data name and the argument is the comparison type and must be one of the following:

=	equal to
<	less than
>	greater than
<> or ><	not equal to
>= or =<	greater than or equal to
<= or =>	less than or equal to

The data name need not be given in full, just enough to be unique, and is not case-specific. In our example, the expression might equally have been abbreviated to:

```
am>100
```

The result of such a search is that the 'Selected=xxxxx' figure in the control panel will say how many records have been matched. Indeed, one may see this figure clock up as the search progresses.

For numeric data comparisons, the meaning of all six possible comparisons types is self-evident, and is the same as BASIC would interpret them. For character data, there are more subtle rules as follows.

a) Whether or not the comparison is case-specific is a choice which you can control via menu 04 [U] option - see below.

b) If the argument is shorter than the data in a record, but equal as far as it goes, then data and argument are treated as equal. Thus for character fields the comparison type '=' means 'beginning with'.

c) If data in a record is shorter than the argument, but equal as far as it goes, then the data is treated as lower than the argument.

Where the target data has a DATE attribute, then the argument must be keyed as usual, i.e. ddmmmyy. But the search process makes the comparison in internal date format. Thus to find all records where Date is later than June 1987, one would use:

```
C
Date>30jun87
```

A most powerful search function is STRING SCAN. This allows any letter, word, or phrase to be sought within data. The way to specify a scan is to place the data name in brackets. For example, to find records where Address contains the word 'London', we would use:

```
C
(address) = London
```

The comparison type of UNEQUAL may also be used. For example, to find records where Address does NOT contain the word 'London':

```
C
(address) <> London
```

All comparison types except '=' are in fact treated as UNEQUAL where string scan is used.

A variation of string scan is GLOBAL SCAN. This is the same kind of hunt except this time every field in a record is examined for a match. Global scan is indicated by using an asterisk instead of a data name. Thus to find all records containing the word 'compute', irrespective of data name:

```
C
(*)=compute
```

In the case of global search, the brackets are not necessary and one may more simply key:

```
C
*=compute
```

String scans are also capable of finding words in DATE fields, or digits in numeric fields. For example, to find all 'January' dates one may key:

```
C
(Date)=jan
```

One more kind of criterion expression remains; this is where no argument is given, and provides the means of selecting records on the basis of whether or not a particular field has any data in it. We may use expressions:

```
data name =                ;i.e. present
data name <>               ;i.e. absent
```

Thus to find all records where there is no Telephone Number:

```
C
Tel<>
```

Search on Record Number

Record numbers are not stored in the file, but are computed in flight. Even so, it is possible to search by record number, using the '%' notation as in the following example:

```
C
% < 100
```

This means 'select the first 99 records'. In other words, think of data name '%' as referring to the record number.

Case-Specific Toggle

Menu 04 [U] will change the case-specific state, so that in one state upper-case letters are treated the same as lower-case, while in the other state (case-specific) the lower-case letters are all 'higher' than 'Z'. The menu itself indicates the current setting.

Select Every Record

Menu 04 [E] causes all records to become selected. This option is also available directly from the menu 01.

Invert Selected Records

Menu 04 [I] provides a quick way to select all unselected records, and to un-select all selected records.

Sets and Combination Searches

Search on data always results in the 'Selected' count being set, and the start of each search sets this count to zero. This seems to give us no means of searching on several criteria - e.g. how can we select all records containing 'London' and/or with an account marked 'unpaid' ? The answer is provided by the SET markers.

Assign Selected records to a set

Every record has seven SET markers, which we refer to simply as sets 1-7. We can assign currently selected records to any of the seven sets, using search menu 04 [A], which yields the prompt:

```
< Assign to set 1-7 >
```

Suppose for example, we have just selected 10 records containing 'London'; we can assign them to set number 1 as follows:

```
A1                    ;assign to set 1
```

Now we can select 'unpaid' - perhaps we find 8 of them; then assign them to set number 2 as follows:

```
A2                    ;assign to set 2
```

You can also assign individual records to a set when in display mode; see chapter 7.

Display Set Counts

We can display the number of records in each set using menu 04 [#], and if we do so now we would see they include:

```
Set 1:   10
Set 2:    8
```

It is important to note that sets of records can overlap. In other words, records in this example which contain both 'London' and 'unpaid' will be present in both sets 1 and 2.

Set assignment is always cumulative. This means that when records are assigned to a set, any records already in the same set are not affected. Thus for example, if we start with all set counts at zero, we can first search the 'London' records, assign to set 3, the search 'Bristol' records and assign also to set 3. The result is that set 3 contains all records which are 'London' or 'Bristol'.

Select by Set

Now we come to Set Select, which is menu 04 [S]. Here, the set markers themselves determine which records are selected. One can select records on the basis of being in a particular set, or in several sets, or in at least one of several sets; or on the basis of not being a member of one or more sets. Menu 04 [S] yields the prompt:

< Select sets: A=all N=none S=some >

On pressing one of the indicated keys you are then asked:

< Enter one or more set numbers 1-7 , and + if cumulative >

Here you key one or more digits 1-7, in any order, and then [ENTER]. The result is that MF8000 will select the combination of records you have specified. Starting at menu 04, possible replies in respect of our example would be:

```
SA1 [ENTER]          ;'London' records
SA2 [ENTER]          ;'unpaid'  records
SS12  [ENTER]        ;'London' records and 'unpaid' records
SA12 [ENTER]         ;Records with both 'London' and 'unpaid'
SN1 [ENTER]          ;All records except 'London'
SN2 [ENTER]          ;All records except 'unpaid'
SN12 [ENTER]         ;All records except 'London' or 'unpaid'
```

If only digits 1-7 are given, then any records which are already selected are un-selected in flight before the sets are compared. But we may wish to leave those records already selected, so that the action is cumulative. This is where the use of '+' is to be used, and it can be anywhere in the reply.

For example, another way of selecting all set 1 and 2 could be:

SA1 [ENTER] SA+2 [ENTER]

Students of SET theory will by now recognise that a Venn diagram will be helpful for complex combinations, and that some combinations can be reached by more than one method.

Clear Sets to Zero

Since all set assignments are cumulative, we need a way to clear them down again. This is done using menu 04 [Z], which yields the prompt:

< Enter one or more set numbers 1-7 >

Reply with any number of digits 1-7, in any order. All sets specified are set to zero.

Set Descriptions

Each of the seven sets can be given a description, which is even preserved when the file is saved. When a set is assigned, the default description is the last-entered Data Compare expression. But you may store any text you like in its place, using menu 04 [T]. This yields the prompt:

< Describe set 1-7 >

Reply by pressing a numeric key to indicate which set, then you are asked:

< Give set description >

Now you may enter any description up to 40 characters.

Exit Search Mode

There are two exits from search mode: [X] to the main menu 01, and [D] to display mode.

More About Sets

We have described set markers as a means of performing combination searches. But you can use one or more set markers for other purposes, perhaps to monitor critical records. Set markers are not affected by save, load, merge. The set markers all share the same byte as the select 'flag' which every record has. The select count is always shown in the control panel, while the set counts are only shown on demand via menu 04 [#].

Note that any changes to select/set counts do not by themselves cause the 'FILE CHANGED' warning. Thus one must remember to save the file if the revised counts are to be retained.

Only one file can be explicitly loaded at a time, but it is possible for a display to call for data retrieved from other files, which are loaded implicitly on a read-only basis. We will use an example to explain how this works. Suppose we have a file of building contracts, called JOBS and containing such data as:

01: Contract number
02: Contractor reference
03: Date of commencement
04: Description of work
05: Estimated cost

Suppose we also have another file of contractors called CONTRTOR, which contains the following data:

01: Contractor reference (key field)
02: Name of firm
03: Name of foreman
04: Address of firm
05: Telephone number

We can load the JOBS file, and design a format which shows not only the contract details, but also any of the information in the RELATED record of the file CONTRTOR.

What makes the link between the files possible is that the data name of the key field of file CONTRTOR is also among the data names of file JOBS. In our example, the common data name is 'Contractor reference'. Thus every record in file JOBS which has Contractor reference for example of 'PM' will relate to the particular record in file CONTRTOR whose key is 'PM'.

One of our JOBS records might be:

```
Contract number       : 405
Contractor reference  : PM
Date of commencement  : 12 Mar 87
Description of work   : Foundations of site 4, Corby Lane
                         development
Estimated cost        : £3500
```

While on the CONTRTOR file one of the records might be:

```
Contractor reference : PM
Name of firm         : Patrick Murphy & Sons Ltd
Name of foreman      : Alan Brown
Address of firm      : 15 High Road Wellingborough
Telephone number     : 0345 666778
```

When designing the relational format in JOBS file, we can specify EXTERNAL data from file CONTRTOR, data numbers 2 to 5. Data number 2 would retrieve the Name of firm, 4 would retrieve Address of firm, etc.

Thus a composite display of some or all of the above data can be specified. Note that any number of records in the JOBS file can have Contractor reference 'PM'; every such record would link to the same record in the CONTRTOR file.

External or read-only files must be keyed. If any key field is duplicated then only the first will be used for relational purposes. Read-only files must be present on the current drive for the implicit load to succeed, otherwise the external fields default to their filler. If a read-only file is on a different disc from the primary file, then change the discs before entering display mode.

A read-only file cannot be altered in read-only mode, and you will find that the display cursor will refuse to address external data. When loaded explicitly as a primary file then of course it may be updated. When you do alter a file which may later be used as a read-only file, take care not to alter the filename since it is also specified within formats of other files.

Although such applications will be unusual, it is possible for one file to link with as many as eight read-only files. Note that the RAM disc must be large enough to receive primary file and all implicit read-only files.

The above example is based on a real application, and shows very well how files relates to each other.

There are several reasons why a relational link may fail, resulting in the external data defaulting to filler text. The reasons are:

a) There is no disc in the currently selected drive.

b) There is insufficient room on the RAM disc.

c) External file name as given in the format is not present as an '.MFC' file on the currently selected disc.

d) The external file is not a keyed file.

e) The key data name of the external file is not among the data names of the primary file.

f) The common data field contains no text in the primary file.

g) There is no matching key in the read-only file.

Should any of the situations a) to e) occur, then a warning is also given:

< Failure to link with file xxxxxxxx (Press any key) >

If for example the disc containing the file is not in the current drive, you may place the disc in the drive, return to menu 01, then [D] to retry the display.

The first access to the read-only file(s) will impose a short delay whilst the read-only data is transferred to the RAM disc. Thereafter, all external data is retrieved at RAM disc speeds and there is no need to keep the source disc in the drive. Thus even with a single-drive system, one can access separate read-only files from separate discs - subject to there being enough room on the RAM disc.

Relational Headings

Consider the situation where several records all relate to the same read-only record. The data retrieved from the read-only record is identical for each of the primary records, because they each have the same data in the relational field - e.g. 'PM' in our example above. Now, if we show a list of these records all on one screen, then clearly the read-only data will be repeated. What would be nicer would be to show the common data just once at the top of the screen with the headings, and list only the primary data below.

This can be done, and the method is to design a format where the external data appears ABOVE the data zone. Such data is shown just once per screen or print page, and a change of screen or page is forced by change of relational link.

Thus records can be displayed in groups differentiated by the relational data at the top of the screen - like variable headings.

Because a new page is forced at change of link data, fragmentation of the display will occur unless the primary file is sequenced to group 'sister' records together. Sister records are those which relate to the same record on the read-only file.

Whilst one may have several read-only files related to the primary file, avoid having more than one read-only file outside the data zone, otherwise fragmentation is bound to occur.

One may make use of display mode [K] to sort the main file into the correct order for grouping to take place. See chapter 7.

Two-level grouping is only applicable to formats which permit several records per screen. If a format has a data zone allowing just one record per screen, then one might just as well show all headings and data in the single data zone.

Two-level grouping cannot take place with just a primary file, since external data only is permitted outside the data zone. It therefore follows that you must design relational files in order to be able to display your data in groups.

Simple Look-up Files

Relational files can be set up purely as a means of expanding abbreviated data in a primary file.

Repetition of bulky data should be avoided where possible, in order to save on keying time and also on disc space. So, we are tempted to use abbreviations and code-words. This is good, except the display looks rather cryptic. We need to be able to expand the coded data back into clear text when displaying it.

Consider a music library file, where data names might include:

01: Title
02: Category
03: Composer
04: Performer

Every record would be categorised as 'Country', 'Light Classical', 'Traditional Jazz', and so on. If the file includes two hundred 'Light Classical' titles, we are tempted to encode them all as just 'LC'.

We can get the best of both worlds by constructing a short read-only file with just two data fields, for example:

```
01: Category          ;the key
02: Full Category
```

Each record is simply a short key such as 'LC', and one text field such as 'Light Classical'. If you only have ten categories, then the file will have just that many records.

Now, the main music file can just hold the abbreviated category in each record, and its formats can retrieve the expanded text on demand. Thus if the read-only file is called 'CATREF', we just use external data items referring to file CATREF data 02 in the formats in order to display the full category text.

Certain aspects of MASTERFILE 8000 operation can be tailored so as to allow individual users to choose which codes to use for some of the functions. And for non-English users, it is possible to change the month names. Such customisation requires that the program component MF8000P2.COM is altered. The customising utility program, MF8000CU.COM is provided to make the changes and re-build the MF8000P2.COM module.

What the custom program does is to load the MF8000P2.COM, show you what its settings are, and invite you to make changes. Then it re-saves the altered MF8000P2.COM - onto either the same disc or onto another disc. To use it, just start up CP/M, place the MASTERFILE disc into drive A, and:

```
A> MF8000CU [ENTER]
```

All the prompts will accept [ENTER] as 'no change', and you are allowed to review the parameters before committing the changes. The main messages are as follows:

```
MASTERFILE 8000 CUSTOMISE

Insert disc with MF8000P2.COM to customise, and press a key

PCW screen lines set for 32 [A] = alter [ENTER] = no change
                         or 25

JanFebMarAprMayJunJulAugSepOctNovDec

Change to the month list   [Y] = yes,  other = no change

Enter month names as 36 characters

Surname shuffle character is <
Give new character, or just [ENTER] for no change

Line-break character is _
Give new character, or just [ENTER] for no change

Export data identifier prefix is &
Give new character, or just [ENTER] for no change

BEEP is loud (or silent)
[A] to alter, [ENTER] for no change

Do you wish to start again ?  [Y] = yes

Do you wish to save customised module ? [Y] = yes

Insert disc to receive customised MF8000P2.COM,
 and press any key.

Customisation complete
```

Assuming that you have saved the new module onto a working MASTERFILE program disc, the customisation is complete. If you need to make further changes later, you can start with any version of MF8000P2.COM.

Note that any change to the month names will automatically take effect with old files, since they use a 'look-up' method. But any changes to line-break or shuffle characters will require that old files be revised.

MASTERFILE 8000 FEATURES

- File capacity limited only by RAM disc – for PCW8256 this is 110K.
- Up to 80 fields per record, each variable-length up to 250 bytes.
- Keyed/un-keyed files.
- Multiple user-defined displays, including facilities for headings, lines, boxes, panels, left/right/centre text, 1–28 records per screen.
- All data can be altered just by steering a cursor to it on the screen and pressing a key.
- Fast and versatile file searches, and a unique system allowing different sub-sets to be pigeon-holed for quick reference.
- Special facilities for dates, surnames, and numeric data.
- Numeric data can be column-totalled, both plus and minus values.
- Printed output.
- Relational file capability allows up to 8 files to connect.
- File save/load/merge/split/import/export.
- Transfer data to/from other programs, e.g. MASTERFILE III on CPC6128.
- Fully menu-driven, machine-coded, and fool-proof. Several example files provided.

Applications include:

Address lists, label printing, stock control, music/book indexing, insurance inventory, price lists, shares portfolio, bibliography, philately, club membership. Just about any card- index application can be brought into the computer age with **MASTERFILE 8000**.

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