

AMSTRAD

MASTERFILE II

128K and 64K versions

Running under AMSDOS

SOFT 07060

MASTERFILE II

Running under AMSDOS

Soft 07060

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Section 1: Introduction

Chapter Contents

Welcome to Masterfile
What is a Database ?
This Manual
Masterfile 464 and Masterfile 128
MAKING A BACKUP
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Welcome to Masterfile

Masterfile is a database program that has been especially designed to exploit the power and features of the Amstrad CPC computers to the full, a program that will handle your most demanding data filing problems with ease.

Because of Masterfile's power and flexibility you will find that there is a lot to learn, but as long as you take it a step at a time the manual and the program itself will help you through any difficulties you may have and you will soon appreciate the full extent of the features offered.

It is inevitable with any serious utility that elements of technical jargon are used in the menu displays and documentation. Don't be worried by these terms, the program is sophisticated, but really very easy to use and you will find that after a bit of practice you will soon know exactly what to do without even thinking about it. If you do come across an unfamiliar term consult the glossary.

What is a Database ?

A database is quick and efficient way of storing, sorting and displaying information, analogous to a simple card index system. Like most computer applications it does nothing that we couldn't do with ordinary pencil and paper but the power of the computer lets us perform these tasks with speed, simplicity, and flexibility impossible to match in any other way.

Masterfile is just a tool, designed to make life easy for you. But it is also the most advanced and powerful tool of its type available. It offers features that are unique in its price range, and rare even in packages that cost several times the price.

With its help you will find that you are able to store data extremely compactly -over 1000 names and addresses can be held in memory at any one time on the 6128, half that on the 464/664, and over 5000 can be stored on just one Amstrad 3" floppy disc.

You will be able to sort the entire data into alphabetical or numerical order, or search for specific entries, in just a few seconds. You will have total flexibility in the way it is organised on screen, or printed out on paper. In short you have complete control over your data but without any of the tedium or duplication of effort that this would normally entail.

If you are new to Masterfile but have used database programs before then you will have to forget all of your preconceptions. There are almost no limitations to the way you enter or handle your data and we have found that some experienced computer users have become confused by looking for restrictions that simply are not there! For example you do not need to specify the length of each field, they are completely variable. Masterfile allows any data text up to a maximum of 240 characters per field and there is no wasted space.

This Manual

This manual has been designed to take you through the various features of Masterfile in the order you would typically encounter them when entering and managing your data for the first time.

However this arrangement is to some extent arbitrary and inevitably will not be applicable in all cases. The flexibility of Masterfile means that you need not necessarily follow the recommended order, as logical as it is. Certainly once your data has been entered you may want to make changes that involve using features in a less structured way to that suggested. We therefore recommend that you work through the various sections in order at least once, even if you have used some versions of Masterfile before, so that you get an overview of the chapters and of where each aspect of the program is dealt with.

The majority of the manual applies equally to both the 128 and 464 versions of Masterfile but it is inevitable that some things differ between the two, these differences are pointed out and where necessary sections have been marked as applicable to the larger memory version only.

Any future revisions to the program, or to the manual, will be detailed in an ADDENDA file provided on the disc. You will be presented with the option to view this whenever you load the program using the RUN "DISC" command.

Masterfile 464 and Masterfile 128

There are several minor differences between the two versions of Masterfile that are supplied on the disc, and some major differences.

When creating a utility program of this type there are always extra features that can be added to increase the flexibility and usefulness of the package. The trade off for these extra features, particularly with the 464 version, is that they inevitably use memory space that could be more profitably employed for the storage of data.

Because of the extra memory provided there are three features that we have only been able to implement on the 128 version of the program.

These are as follows

- a) A data merge option for appending two short files.
- b) A data export facility to save data in a variety of formats to suit other programs.
- c) The provision of User BASIC entry points that allow you to add custom made routines to the program, and manipulate the data in new and ambitious ways.

For those owners of a CPC 464/664 who need access to these features a Masterfile 464 extension pack has been written. Contact Campbell Software Design directly at the address given for more details.

The other obvious difference between the two programs is that the 128 version provides you with twice as much room to store data, in fact the entire second 64K memory bank is used for data. There is a small price to pay in that certain features that access or scan all of the records in turn will take longer to complete. This is of course partly a function of the larger file size, but it also includes some time required to handle the memory bank switching. For some functions such as sorting there is a geometric increase in time taken as the file increases in size.

Within the restrictions of memory size available, Masterfile data files are compatible with all versions of the program that run on the Amstrad CPC computers, irrespective of whether the files were created on the 464/664 or 6128.

For the purposes of Sorting a file Masterfile 128 reserves workspace large enough for records of up to 4K in size. In effect this means that any sort will be abandoned if a larger record is encountered. We really do not anticipate that many people will find this restrictive. This 4K limit does not apply on the 64K version of Masterfile but a successful sort will only be performed if you have preserved enough spare room in the file space to handle the largest record size.

If you have a 464/664 computer which has been fitted with a proprietary 64K memory expansion board you should be able to run Masterfile 128.

Making a Backup

Backing up your program disc is the very first thing you should do. The purchaser is permitted to make backup copies of the program for the purposes of security, for transfer to a different medium, or for customisation. Passing copies of the program to any third party is NOT permitted, and is a breach of software copyright.

Masterfile 464/664

Choose the 'exit to Basic' option B from Main Menu and type

```
Goto 999
```

which will perform a complete save of both program parts. Before making a direct save in this manner first ensure that there is no data file resident in memory, i.e. the `BYTES USED` status line registers `0000` and `0%`.

If saving to tape from a disc version of the program (useful for security purposes) or vice versa then remember to first issue the appropriate `TAPE` or `DISC` command or select `TAPE` from the save load menu prior to entering BASIC.

Alternatively the program components may be duplicated using the CP/M utilities `FILECOPY`, `COPYDISC` or `DISCCOPY`.

The BASIC loader part of Masterfile can be copied by just `LOAD`ing it and then saving it on another disc. You will see later that different filenames can be used for saving customised versions of the program.

Masterfile 128

The program is in two parts:

`MF128MCD.BIN` which is the main machine-coded logic, and `MF128.BAS` which is loader and skeleton User BASIC. `MF128MCD.BIN` may be duplicated using the standard CP/M utilities, e.g. `PIP` or `FILECOPY`. Alternatively an entire disc may be backed up using the `DISCKIT3` utility.

`MF128.BAS` may also be duplicated this way, or more simply one can `LOAD` it and then `SAVE` it just as one would any other BASIC program. This will be normal procedure if you are developing various User BASIC programs. The filename for saving can be anything which BASIC allows and you may therefore have several loaders on the same side of a disc.

Section 2:

Getting to know Masterfile

Chapter Contents

How does Masterfile Store Data ?

Getting Started

Golden Rules

Loading Masterfile

The Status Line

The Main Menu

Editing Your Text Entries

How does Masterfile Store Data ?

When using Masterfile you will need to become familiar with some commonly used terms. A **FILE** is the name given to the entire collection of data held in memory at any one time, or stored on tape or disc under its given filename. Look on it as the box in which you keep your index cards.

A **RECORD** is the name given to each separate collection of data stored in the file, it is equivalent to each individual card.

Within each record are a collection of **FIELDS** which represent an individual item of information you want to store. In an address index for instance you would have one field for the person's name, one for the address and one for the telephone number. The advantage of sub-dividing the data in this way is that it gives you more flexibility than would be possible with just pencil and paper, for example you can choose to display names and telephone numbers only, without cluttering the screen with the addresses.

Each field is identified by a unique one-character code letter, number or symbol called a **DATA REFERENCE** but can also be referred to by a more friendly **DATA NAME**. For example the Reference code for the address field may be 'A' but the Data Name will probably be 'Address' of course. Where appropriate Masterfile will use the Data Name to make it easier for you.

Almost all of the options performed on the data by Masterfile will only work on a subset of the records, those that have been **SELECTED**. All newly created records are regarded as being selected, but you are free to unselect them either explicitly or on the basis of a logical search of the data that they contain.

The majority of uses for Masterfile will probably be simple LIST files. A list file is any collection of information wherein each record has a consistent and predictable structure, for example addresses as mentioned above or recipes with divisions for name, ingredients, preparation time etc., stock inventories, exam results, price lists.

However Masterfile goes further than that and allows you to manage your data in a RELATIONAL way. This highly professional feature is simplicity itself to use and greatly increases the usefulness of the system.

It can be formally defined by saying that groups of records can be associated with other records in the file such that data held in one record is automatically accessible from another. All this means in English is that if any group of your records have some information in common you only need to enter this once and the computer does the hard work of making it appear with all the other records where it is required.

Any record that holds information that is used by several others is called a PARENT. Any record that obtains some information from another record is, not surprisingly, called a CHILD. Don't worry too much about these terms, they will be explained in more detail later.

A quick example to whet your appetite would be in a catalogue of music albums where you may have several titles released by one artist. Rather than retyping the artist's name every time you want to catalogue an album you can designate the name as a parent record and all the album titles as children. You can then tell the computer that every time you want to look through the database it should automatically print the artist name (parent) every time it prints the titles (the children). There are even more potential advantages with a relational database but these too will be given in the appropriate section.

Getting started

That is enough theory for now, this section will teach you how to load Masterfile and give you an overview of the various program parts but there are one or two practical points to deal with first.

If you are new to Masterfile you would be well advised to work through the first sections of this manual as far as Loading And Saving Data. You will be told if any parts aren't absolutely essential to make the program work, and these can be skipped over if you wish. However it is worth finding a bit of time to skim through them sooner or later to find out just what Masterfile is capable of. The advanced features are there to make your database as powerful and as adaptable as possible and with just a little effort you may find options that meet your needs much more efficiently.

You will find that learning Masterfile is much easier if you work through the appropriate sections of the program in parallel with the manual.

Golden Rules

The most important thing to remember is that there is no need to panic. As long as you are sensible with your discs and cassettes there is nothing that can happen that is very drastic. Any options within the program that will result in loss of data will first ask you to confirm that it is really what you want to do, if you have pressed the wrong key by mistake then just type 'N' at the prompt. In other circumstances where you have made choices such as **SORT** or **SEARCH** and later change your mind it is just a matter of a few seconds to restore the data to the way it was originally. The key to painless use of the program is to follow these golden rules:-

1. Before you do anything else make a backup copy of your master disc and put the original in a safe place. Accidents can happen all too easily.
2. If using tape to store data then be sure to keep two copies of the save on two **DIFFERENT** tapes. **NEVER** resave changed data on top of the old version, if someone kicks the plug halfway through the save you will lose both versions. Using discs gives you the advantage that as long as there is room on the disc there will be an automatic backup copy of the old file made when you resave it. It is still advisable to keep copies of important data on two discs in case someone uses one as a coffee mat.
3. When using Masterfile if you make a wrong menu choice and find yourself in a situation you don't want to be in then remember that you are always provided with back out options, in other words you can always change your mind!

There are three situations where this can apply:-

If you have made a wrong choice that has taken you to a new menu then there will always be the option **EXIT:X** which means that by pressing key **X** you will be returned to the part of the program you were on previously. If you are lost pressing **X** repeatedly will probably return you to the main menu.

Secondly if you have made a wrong choice and have been presented with a prompt to enter some text e.g. **GIVE DATA NAME** then just pressing the **[RETURN]** or **[ENTER]** key or **[ESC]** will return you back to the previous menu **WITHOUT ANY CHANGES BEING MADE**. This applies even if you have chosen an option to alter some existing text. However if you have begun to enter some new text and wish to back out you should use the **[ESC]**ape key.

Finally if you have told the program to do something potentially time consuming such as **PRINT** or **SORT** you can stop things at any time by pressing the **[ESC]**ape key.

-
- Occasionally Masterfile will signal the presence of errors in the data by sounding a BEEP. Please remember to turn the sound up when using the program.

Loading Masterfile

The disc that comes supplied with Masterfile will have a copy of both the 64K and 128K versions of the program one on each side. Attempting to run the 128 version into an unexpanded 464/664 will of course be unsuccessful.

Once you have become familiar with Masterfile and begun to use it in earnest you may want to produce a customised version that suits your particular needs. This could include changes to the colours used or function key definitions and can be added as extra lines in the BASIC loader which can then be resaved under any name you choose. This special version can be accessed directly by a command such as RUN "NEWNAME".

On the disc you will also find some sample files called FILE1, FILE2 and FILE3 which will be used later on in the examples section. These need not be backed up, and can even be erased, but you are advised to keep them for a while so you can study how they work.

Menus prompts and editing.

Masterfile has been designed to make things as simple for the user as possible by extensive use of menus and prompts. A menu is just a friendly way of providing you with a range of choices and where space allows these will be presented in the centre of the screen. Occasionally they will be displayed on one line at the bottom. All of the options will be largely self explanatory. Pressing the appropriate key from those displayed will instantly move you onto the next step. You don't have to worry about pressing [SHIFT] or [CAPS LOCK] at the same time, either case will do. Often there will be only two or three possible choices and making your mind up will be easy. However the sophistication and flexibility of the program inevitably means that at times there will be a bewildering number of choices and occasionally, in order to preserve the screen display, there will be choices available that aren't immediately obvious.

When Masterfile needs you to enter some text a prompt will appear on screen telling you what it wants. This will be followed by the cursor blob which prints the text on screen as you type so you can check for mistakes. In these situations nothing will be done with the text you type until you press the [ENTER] or [RETURN] key. This gives you the chance to make alterations and change your mind.

When you are entering some text from the keyboard it is inevitable that mistakes will occur. Corrections are made using a small set of editing keys. You will find that the cursor blob can be moved over the line of text using the left and right cursor keys. Similar to when programming in BASIC as you type a line any character that has been entered incorrectly can be removed by positioning the cursor to the right of it and pressing the [DEL] key. Alternatively you can position the cursor over the character itself and press the [CLR] key. For large scale deletions remember that keeping the [DEL] key pressed will cause the cursor to run from right to left erasing the text. Alternatively keeping the [CLR] key pressed will ensure that the cursor remains stationary but text is sucked in from the right of it to be deleted.

Unlike the BASIC editor there is no insert mode with Masterfile, which means that as you type text it is printed OVER any existing writing that is on the right of the cursor rather than moving this along to make room for the new. However there is the facility to insert spaces into the text by positioning the cursor and pressing [CTRL] and the [SPACEBAR]. To add a word to the middle of the data you must insert the required number of spaces and then overwrite these with the appropriate text.

You will also need to use the editor when you wish to update your data to reflect any changes in it. You will see later that altering existing data can be done from Display Mode. Once you have specified which part of the current displayed record you wish to amend the existing data will be copied onto the screen and the cursor positioned ready for the editing. Of course for large scale alterations you can choose to delete the old version entirely and enter the new from scratch.

The Status Line

Once you have loaded Masterfile you will be presented with the MAIN MENU screen. Masterfile operates in mode 2 (80 column mode) only but the colours have been chosen to give what we feel is a very clear display on the colour monitor.

MASTERFILE 128 ver 2.1

Copyright 1985 CAMPBELL SYSTEMS

```

Load/Save file.....I
Display/Print.....D
Add new record.....A
Un-select all recs.....R
Invert selection.....I
Search the file.....S
Purge selected recs.....P
Sort into Order.....O
Data Names.....N
Format report.....F
List report titles.....C
Lock.....L
Unlock.....U
Export Data.....E
Exit to BASIC.....B
Colours.....*
  
```

File: GARDEN Records:0000 Selected:0000 Parents:0000 RAM used:01K from 64K

At the top of the screen you will see various copyright messages and the title of the program. At the bottom appears a STATUS line which is there to keep you informed about various aspects of the program. From left to right you are given the following (don't worry if some of the categories seem unfamiliar the first time, it will all be explained in due course):-

NAME OF FILE

The file is designated as NOTNAMED as soon as you load Masterfile. However once you have made the choice to LOAD/SAVE a file you will be prompted to supply a filename, with a maximum of eight characters and this will then become the current filename.

NUMBER OF RECORDS

This tells you simply how many records have been created in this particular file.

RECORDS SELECTED

This figure shows the number of records that have been designated as SELECTED. As soon as you enter a new record it is flagged as being selected but any operation such as searching the file for certain entries can alter the selection status. Only selected records can be displayed, printed, altered, purged or exported.

PARENTS

This figure shows how many of the records are designated as Parents as shown by the presence of a data reference '>'. For a normal, non-relational list file this should be zero. Note that the figure is independent of which records are selected.

MEMORY(BYTES) USED

This is a measure of the amount of free space left in your database. On the 6128 version this is expressed in terms of 'xK used from 64K' On the 464/664 version this is expressed in terms of how many bytes the file occupies and the percentage of the total available that this represents. Memory management is more critical on the 64K version and when this figure starts to approach 90% it is time to consider splitting the file into two halves. This can be done by selecting half of the file, purging it and saving the remainder with a new name. The original file is then reloaded, the selection repeated, inverted, purged and saved again with a second new name. On the 464/664 version a certain amount of room has to be reserved for operations such as SORT or CAT. Any attempt to overflow the available memory will cause a beep and the message *** NO MORE ROOM *** press [ENTER] will appear. No damage will have been done to the file but the attempted task will be aborted.

The Main Menu

The Main Menu is the central control panel of Masterfile. From here you make choices that will take you to specific parts of the program and the specific menus that control them. Here is a reference guide to the meaning of each choice on the main menu. Don't worry if you don't follow the explanations the first time, everything will be explained in more detail later.

- T Load/Save File - leads to a menu for selecting tape or disc A/B. You can then load, merge-load, or save a file.
- D Display/Print. This enters the Display Mode PROVIDED THAT YOU HAVE DEFINED A FORMAT TO USE WHEN DISPLAYING THE DATA. From Display mode you can study, print or alter the data viewed. Note that other sub-menus also offer a D option so you can see the data without having to return to Main Menu first.
- A Add new record. When you are first constructing or amending your database this will be one of the most commonly used options. You will be prompted at the appropriate point to enter the data for each field within the record according to which fields have been defined using the Data Names option. Fields are entered in the order with which they were defined and each newly created record is placed at the end of the file and flagged as selected ready for sorting or display. Note that you can also insert previously undefined fields into a record but of course you will not be prompted to do so.
- R Un-select all records. This can be thought of as a 'reset button' for use before starting a new file search. It gives a clean sheet ready for further operations.
- I Invert selection. This has the effect of making all selected records unselected and vice versa. When used following the R option it has the effect of selecting ALL records. Other applications should be obvious e.g. you could print a list of all customers that are in credit then by inverting the selection you could produce a second list of all those that aren't.
- S Search the file. This option takes you to the search menu from where the records can be selected or unselected on the basis of their contents. Once the database has been created this could be the most useful option for many applications. Note that the search menu is also available from display mode.
- P Purge selected records. Purge erases all the records that have currently been selected. It is essential for files with regularly changing contents e.g. club membership lists. Because it is a potentially drastic function you are prompted to confirm that this is really what you want. Please make sure you understand that purge works on SELECTED records.

-
- O Sort in Order. This takes you to the Sort menu from where you can specify the criteria by which the records are rearranged e.g. sort alphabetically by names. Note that this option is accessed by the letter 'O' rather than zero.
 - N Data Names. This will be used primarily when starting a new file, or when adding new fields to existing records. From this option you go on to specify the one-character code symbols you will use to identify each individual field, and the optional name that will be used for these symbols. These names do not have to be given but when inserting a new record for example it is much more friendly for the computer to prompt you with a name such as 'TELEPHONE' or 'ADDRESS' rather than the code symbols.
 - F Format. This takes you to the Format Menu from where you can choose to create/review/alter a display format. The format is the means by which we tell the computer which fields in each record we wish to see or print from display mode, and the way that these should be arranged on screen or on paper. It follows that unless we have specified at least one format the display mode will not be able to show us anything. This is therefore one of the most important functions we should use when setting up a new file but it will be useful at any time for choosing to display a different selection or arrangement of data from the total held in each record. The technical term for the part of a database that fulfills this function is the 'report generator'.
 - C List report titles. This can be looked on as the option that lets you choose (C for Choose) the format that should be used to display data in display mode. It lists all the different formats that have been defined showing their titles. Note that you can also switch formats direct from display mode.
 - L Lock. This options prompts the user to enter a short password of 1 to 5 characters after which most of the Main Menu options are disabled. The only one that will respond after this point is U for Unlock. This is useful for confidential records if the computer is to be left unattended for a while. If you have pressed this option by mistake don't forget that you can back out before you have entered the password by just pressing **[ENTER]** or **[RETURN]**. For complete security of data you would be advised to take your disc or cassette with you.
 - U Unlock. This is the means by which you can re-enable the main menu functions after it has been locked. You are prompted to re-enter the password that you gave at Lock time.
 - B Exit to BASIC. Masterfile runs entirely in machine code for compactness and speed but it is loaded and started via a short BASIC program. This option allows you exit to this loader so that you can choose colours, program function keys, change printer codes or back-up the disc.

6128 version only: The MASTERFILE 128 loader can be extended by the use of some special commands to provide direct access to the file data from BASIC, so that you can program your own special processing of the file. This option will be explained fully in the section called Advanced Uses.

- * Set colours. The colours used in the program may not meet your personal preference and if you wish to search for a more pleasing and clear combination this option allows you to tune them to your choice. Your chosen colours will stay in force for as long as your session with Masterfile lasts but the next time it loads the default colours will be back. For a permanent colour change exit to BASIC and add a line to the loader which should then be resaved. Note that these colours are used for the menus only - when data is being displayed the colours used are those specified in the current format.

- E Data Export. MASTERFILE 128 only: This option allows you to save data from the currently SELECTED records in a variety of possible forms. By answering five yes/no questions you can produce disc or tape files in a variety of configurations allowing it to be read by most other data handling programs you will come across. Note that before using this option you should ensure that you have made the correct tape/disc selection via option 'T'.

We are now ready to move onto a detailed tuition course for each of the aspects of Masterfile.

Section 3: Creating a New Database

Chapter Contents

Entering Your Data

Step One - Data Names

Step Two - Adding Records

Relational Data

Setting Up a Relational File

Another Example of Relational Files

Advantages of a Relational File

Arranging the Data on Screen and Page

Creating A Display/Print Format

Step one - the format menu

Step two - the report geometry item

Headings and records

Step three - the heading item

Step four - the record data item

Word processing

Numeric editing

Step five - the ruled line item

Step six - correcting the format

Example of Format Creation

Entering your Data

Step One - Data Names

When you are ready to begin entering your Masterfile data the first step will probably be to choose the Data Names option N on the main menu. This selection is not essential to the running of the program, but it will make things much simpler for you in the long run.

If you haven't done so already load Masterfile and press this option now. You should now find yourself with a screen display that looks like this.

Data Names

```
U: VARIETY NAME
L: FLOWER/LEAF COLOUR
†: CHILD LINK TO PARENT
S: SPECIES NAME
C: COMMON NAME
G: GROWTH HABIT
>: PARENT LINK TO CHILD
```

I: insert E: erase P: print X: exit

File: NOTNAMED Records:0000 Selected:0000 Parents:0000 RAM used:01K from 64K

On later occasions when you return to this option you will find that all existing defined names will be listed there for you to see, as in the illustration.

When starting as new the first option is to press I for insert and a prompt will appear saying

```
Insert after which ref?.
```

The order in which the names are entered into the list determine the order in which the data fields are prompted when you next add records to the file. In the first instance the above question is meaningless and anything you type will be ignored so it is best to just press **[RETURN]/[ENTER]** to move onto the next step.

If you have some data names already defined then pressing **[RETURN]/[ENTER]** at this prompt will mean that the new name is be added to the end of the list. From Masterfile's point of view it is largely unimportant which order the data is entered but you may find it convenient to follow a certain routine. This is particularly true when you have some fields that are present in almost every record and some that only appear in a few. By putting the more common fields at the beginning of the list you can avoid the latter ones, when necessary, by making a premature exit from the prompts by using the **[ESC]**ape key.

If you ask for the new reference to be inserted after a code that hasn't yet been defined then Masterfile will ignore this and put it at the end of the list.

You will then be prompted

Give data reference.

As explained in the Getting Started section the data reference is a unique one-character code that identifies each individual field. You will use this identification to tell Masterfile which fields you would like sorted, displayed etc. You can therefore only use each code once at a time, but with one or two exceptions you can use any character available on the keyboard except of course control keys such as **[CTRL]**, **[DEL]** cursors etc. All letters are case independent i.e. 'á' and 'A' are treated as the same but other characters obtained via the **[SHIFT]** key such as '+' and '&' can be used. In practice this gives you about fifty possible legal codes.

If your records consist of only a few fields it is quite easy to ensure that the choice of codes act as a memory jogger for their contents e.g N for Name. However as soon as you start to add more than about a dozen fields you will probably find that it becomes very hard to keep any sort of link between them; that is why we have Data Names as well as Data References.

The only choice of characters that should be avoided at this stage are '*', '>' and '↑'. '*' is a bad choice since it is used in the Search Data option as a type of wild card to signify 'all data', using it elsewhere would lead to ambiguity and confusion. The characters '>' and '↑' are reserved for use when signifying Parent and Child related data. Note that when we talk of the ↑ character we mean that one which appears on the 'f' sign key, to the left of **[CLR]**. This must not be confused with the cursor UP key in the cursor cluster.

Pressing **[RETURN]/[ENTER]** at this point will back out of the insert routine and return you to the menu of four choices.

Once you have chosen your data reference you will then be prompted

Data Name:

You should then enter your chosen name by which this field can be referred in the future. Unlike the references the name can contain any characters and the same name can be used more than once although that tends to defeat the object. The names can be very long but in practice you should limit them to under 25 characters to avoid wasting memory space and to preserve the screen display.

If you just press **[RETURN]/[ENTER]** at this point the data reference will not be added to the list, you will not be prompted for it and any data entered under this reference code will be regarded as UN-NAMED.

Once you have entered your choice of name and pressed the **[ENTER]** key the screen list will be updated and the name inserted in its proper place.

Because they are expected to be quite short, and not displayed with the data, there is no option to alter a data name once defined but of course you can choose to Erase (option E) a name and then re-insert it.

Once you have finished entering all the names you want to, pressing **X** for **EXIT** will return you to the Main Menu. Before doing this you may find it helpful to press **P** and get a print out of all the names you have defined for your own reference. Before choosing this option do make sure the printer has been switched on!

Step Two - Adding Records

From the Main Menu you should now choose option 'A' to add a record. You are then taken to a display which prompts you, with each of the data names you have defined, to enter the text that corresponds to each field.

If at any of the prompts you just press the **[RETURN]/[ENTER]** key then this tells Masterfile that this field should be left out of that particular record.

Pressing **[ESC]** at any of the name prompts will omit that field AND ALL SUBSEQUENT ONES AS WELL.

Once all the names have been dealt with, or once you have pressed **[ESC]** you will be presented with this four choice menu

Add new record

U: 'Purpureum'
L: Leaves purple on the underside
↑: ACER

I:insert **E:**erase **A:**alter **X:**exit

File: GARDEN **Records:**0002 **Selected:**0002 **Parents:**0001 **RAM used:**01K from 64K

Any of the first three, once chosen, prompt you for the reference code of the field you want to work on.

Option 'E' can be used to remove any of the specified fields you have entered into the current record.

Option 'A' can be used to alter the given text for a field using the editor.

Option 'I' lets you insert a field that you have previously omitted from the record. It also lets you insert a field that you have not even defined in the Data Names section! Indeed you do not necessarily have to define any data names at all and you could start a new file by pressing 'A' for 'Add new record' direct from the Main Menu.

New, previously undefined, fields that are added to an existing record do NOT appear in the Data Names list. This feature allows you to insert 'one-off' data that you do not wish to be prompted for every time you add a new record. However it does have implications for the Data Export utility in that any un-named fields are not included in the output file. This will be explained more fully later.

All the characters that you type in response to the prompts will be reproduced in the data as written, with the exception of two important control codes that can be embedded in the text. The two characters are the backward slash '\ ' and **[SHIFT]-ZERO** ' _ '. These will be dealt with again later in the manual but a brief explanation should suffice now in case you want to include them in your data.

Backward slash '\ ' is used in sort mode when you want to arrange the data alphabetically using a word that does not appear first in its particular field e.g. if a name field contains 'D.H. Lawrence' you will want to sort it as 'Lawrence D.H.'. By inserting the backslash thus 'D.H.\Lawrence' you can do this. The '\ ' key will be shown just as a space in Display Mode.

The other control character '_' acts as a line break code that lets data entered as one long line, e.g. an address, to be printed across several lines in Display Mode with the line breaks appearing where you want them.

Once you are satisfied with all of the fields in the record you should then press **X** for **EXIT** and the record will be added to the file. After this point any further changes can only be made via the Display Mode only.

You will then be given a new menu choice

A:Another record Any other key: Exit

Use 'A' to add another new record immediately and press any other key to return to the Main Menu.

All newly added records are regarded as selected.

It is possible to create a record which has no fields at all, either by not entering any data at the prompts or by erasing all the fields created. This blank record does not take up much memory but it does contribute to the count of the 'number of records' shown in the status line and it will appear as a blank in display mode. Such empty records can be removed by careful use of the purge command or explicitly through the display option.

Relational Data

An understanding of relational data is not essential for the use of Masterfile and if it doesn't appeal you can skip this section. But it is such an efficient and powerful way of handling your files that it is well worth a little effort to come to grips with it.

A relational database is a system of storing information in a more compact, flexible, and useful way than possible with a simple list file. It becomes an advantage when a group, or several groups, of different records have parts of the information they hold in common. Using a relational system we need only enter this common information once, yet make it accessible to all records, saving on time and memory.

You will probably have gathered by now that a relational file regards records as being divided into two types called parents and children. A parent is designed to hold information that needs to be accessed by several other records. A child is one of the records that obtains some of the information it needs from a separate parent record.

Once they have been set up it is possible for the operation of relational files, and the exchange of data from parents to children, to remain almost invisible to the user. Parent data can be made to appear whenever a child record is studied, as if it was a part of that child record at all times.

To see how this works let us recap on the music album example mentioned previously in slightly more detail. Say you wanted to keep a catalogue of your albums with two fields

P:Performer T:Title

At first sight this looks like a very simple arrangement which could easily be handled by an ordinary list file.

But assume you had 23 Ella Fitzgerald albums, 19 by Oscar Peterson and so on. In a list file the data field P:Performer will be typed in so often that the file may become too large. Because so much of the data is repeated it is better if we can designate that part of the information that is shared by the different records as the parent (e.g. the artist Ella Fitzgerald) and that part of the data that differs from one record to the next is designated as the children (the record titles such as Love is Blue, Night Train etc.).

All that then needs to be done is to create a special link field that is the same in the parent and all of its children. This makes a connection between the records and tells Masterfile where the shared information is to be found. If we then create a display format that is designed to show fields that are absent from the child, and present in the parent, Masterfile will look them up and insert them on screen, or on paper, in the correct place.

All we need to do to designate a record as a parent is to include a field with a data reference code of '>' followed by a short and unique identifying code e.g. >ABC. To designate a record as a child of that parent we need to include a data reference of '↑' (the key to the left of [CLR]) followed by the same short code i.e. ABC. That is really all there is to it. Masterfile then knows that those two records have been linked together in a relational way.

After this, whenever a child record is printed or displayed Masterfile automatically looks up any other required information from the parent record and includes that as well. The screen display could then show both parts of the data, e.g. P:Performer and T:Title, together in a way which is indistinguishable from a normal list file.

It is perfectly possible for fields within the parent and its children records to use the same data reference codes. When Masterfile comes to display one of the children it will try and find all of the required fields there and then. If it is successful it will never even bother to look for the parent. The field can therefore be present in both parent and child, or in either depending on whatever suits you.

However if some fields that you want displayed are not found in the child, Masterfile will then look to see if the information is held in the parent and, if successful, it will display the text from the parent. Only if neither record holds the required data does Masterfile leave the field blank or insert a filler marker. The parent record is searched for the data WHETHER IT HAS BEEN SELECTED OR NOT. Indeed when we have produced a relational file we would normally have either parents or children selected BUT NOT BOTH.

For the example given we would simply have parent records that contain two fields e.g.

```
P:Ella Fitzgerald          (Performer)
>:EF                      (Down-link field)
```

This would be repeated for each artist in your collection, specifying different codes for the link field in each case e.g. >:OP for Oscar Peterson

The children would also have two fields

```
T:Love is Blue           (Title)
↑:EF                     (Up-link field)
```

This child format would be repeated for each of the 23 album titles you have by Ella Fitzgerald and then you would go on to enter all of the titles you have for a different performer using the next, different, up-link code.

The display format would specify that you want to see both P:Performer and T:Title. The next step is to select child records only and then switch to Display. Each of the the child records when viewed will show both the performer, looked up from the parent record, AND the album title.

If you choose to select and display parent records Masterfile does NOT automatically look up information from the various children and display that as well even if some of the child fields are requested in the display. However you can arrange the display so that the parent data is only printed once each screen, followed by as many of the children as would fit on together. This will be explained in the section on Displaying And Printing The Data.

Quite simple really but very useful. The example given would apply equally to any catalogue or index system wherein certain fields are repeated over several records.

It follows from the above explanation that a parent record can have several children, indeed there is little point in creating a relational file that only has one child allied to a parent, unless you intend to add new records later.

However a child record can only have one parent. If you create two parent records with the same down-link code to children Masterfile will only read data from whichever one is first in sequence in the entire file.

You can use a record that is itself a PARENT to a set of children as one of the CHILDREN of yet another parent record but Masterfile cannot link the records over more than two levels. It does not support 'grandparents' per se. Therefore if a requested field is missing from both the child and its parent, Masterfile does not look to see if the parent itself also has a parent which might hold the data.

Masterfile does not mind if you set up a file that includes childless parents and parentless children ('orphans'), and it has special options that allow you to find such records if you want, but it is likely in most completed applications that the presence of an orphan at least will be an error. Of course you can also have 'solo' records within the file at the same time, i.e. ones that are neither a parent or a child.

Because Masterfile begins its search for the appropriate parent from the beginning of the file you can ensure that the search and display is speeded up by SORTING the data in such a way that all the parents move to the front of the file. The way to do this will be explained later in the manual.

Setting Up A Relational File

Well we've told you all of the theory to do with parents and children. Work through this example and you should feel more confident about it. The example given is not the perfect way to design a relational file, but has been chosen to illustrate one or two points you may not be sure of.

If you haven't done so already, run Masterfile and press option N from the main menu. We are going to create a database of garden plants and want to be able to display the following fields on each record.

S:Species Name
C:Common Name
V:Variety Name
G:Growth Habit
L:Flower/Leaf Colour

By now you should know exactly how to enter these names into the file. Return to the main menu and press option A to add a record. As we come to enter our data we realise that different varieties of plants in the same species often have a lot of features in common but differ only in characters such as leaf colour.

We then decide to minimise the need to keep typing the same data by creating a parent record. Let us create this record first. The plant we are going to deal with is the Sycamore tree. Enter the following at the prompts

Species Name: Acer pseudoplatanus

Common Name: Sycamore

Variety Name: Since this will differ with every record we do not want this field to be represented in the parent file so just press [RETURN]/[ENTER]

Habit: A bushy rounded deciduous tree, ultimately of large size

Leaf colour: Again just press [RETURN]/[ENTER]

The next step is to signal to Masterfile that this is a Parent record by inserting the data reference '>' followed by a short code, say 'ACER'.

We can then press X to EXIT but do not press A to add another record. Instead let us return to Main Menu, and then to the Data Names option. We have two changes to make here. First of all we should move the child reference codes to the beginning of the list, to save time when we are entering the rest of the records. To do this use the insert and delete options. When you delete an existing data name this does NOT have any effect at all on the already entered data, which retains its existing data reference code. Secondly the parent and child link fields can be given a name which prompts us at the appropriate points.

You should finish up with a data list like this

V:Variety Name
L:Flower/Leaf Colour
↑:Child link to Parent
S:Species Name
C:Common Name
G:Growth Habit
>:Parent link to child

Now we return to Main Menu and then to the Add Record option. This new record is to be one of the children and we answer the prompts in this way:

Variety Name: Purpureum
Flower/Leaf Colour: Leaves purple on the underside.
Child link: ACER
Species name: [ESC]

By arranging the names in this way, although it looks illogical in the list, we can use the [ESC] key to finish each record BEFORE the parent record prompts appear. We can then go on to add another child.

Variety Name: Worleei
Flower/Leaf Colour: Leaves are a soft yellowy/green.
Child link: ACER

What we need do now is to create a format that displays all five fields together and select CHILD records. Every time Masterfile tries to print one of the children in Display Mode and finds a missing field it will look to see if it exists in the parent record. The result will be a screen full of all the data you want but with a big saving in time and memory.

Suppose now that we want to add a third tree to the list but we find that, due to some weakness in its constitution, as well as having a different leaf colour this tree also has a different growth habit. No need to panic, its simple to take account of this.

Again we need to go to the option to Add A Record. Answer the prompts in this way.

Variety Name: Brilliantisimum

Flower/Leaf Colour: Leaves are an unusual shrimp pink colour in spring.

Child Link: ACER

Species name: [RETURN]/[ENTER]

Common name: [RETURN]/[ENTER]

Growth Habit: A bushy rounded deciduous tree of small size.

Parent Link: [ESC]

In this case when we return to Display Mode and Masterfile comes to this third tree variety it will take its text for the Growth Habit field from the child rather than from the parent.

The most important thing to remember is not to enter the parent-child link at BOTH of the prompts.

When we need to insert another parent record, for another tree species, we will need to bypass the first three prompts by pressing [RETURN].

Another Example of Relational Files

We will use one of our example files to illustrate again how parent data is shared and made available to related child records.

Load the example FILE3 from the disc and examine the Status line at the bottom of the Main Menu screen. You should see that there are more records created in the file than are selected. The selected records are of course the children, parent records are currently unselected.

Now select Format 3 from the C>List Format Titles option of Main Menu. You will then go to Display Mode you should see a display like this. Note that certain of the data fields are displayed several times over several records -exactly the circumstances in which a relational file becomes most useful.

E)		Summary of Invoices	
BUF	84294	£235.00	British United Freight
BUF	84299	£98.00	British United Freight
BUF	84550	£305.00	British United Freight
BUF	84553	£133.00	British United Freight
CEP	82221	£22.77	City Electro-phospors
CEP	84222	£144.66	City Electro-phospors
CEP	84230	£59.60	City Electro-phospors
JKL	83549	£195.00	JKL Chemicals
JKL	83554	£1,234.50	JKL Chemicals
JKL	84009	£88.00	JKL Chemicals
WIG	84022	£329.90	Wigan Indutrial Gemstones
WIG	84533	£210.75	Wigan Indutrial Gemstones
Totals:		£3,056.18	

(H to see menu options)

File: FILE3 Records:0017 Selected:0012 Parents:0005 RAM used:02K from 64K

You can now choose to examine the data fields that are held in the current top record by pressing A as if to alter. You should see a screen like this.

Update

f:BUF
I:84294
D:20 Aug 84
G:235
P:02 Oct 84

I:insert E:erase A:alter X:exit

File: FILE3 Records:0017 Selected:0012 Parents:0005 RAM used:02K from 64K

You can instantly see that only some of the information displayed on the original screen is held within the child record, most notably the legend British United Freight must have been taken from the Parent, which is not selected.

The current top record is obviously a child, with an up-link code to its parent of BUF. If you want to see this parent record go back to Main Menu, press I:Invert Selection, D:Display and again A:Alter and you should see this.

Update

```
>:BUF
F:British United Freight
A:493 Western Avenue_Gloucester_GL9 5JN
T:0452 677332
C:Mike Horne
```

I:insert E:erase A:alter X:exit

File: FILE3 Records:0017 Selected:0005 Parents:0005 RAM used:02K from 64K

If you then return to Main Menu and thence to Format mode, choosing to Review Format 3, then by stepping through the various Items you can confirm that the Format calls for four Record data fields to be displayed, the child link (↑), the invoice number (I), the Gross amount (G) and the Firm's Name (F).

Of these the first three can be found in the child record itself but Masterfile will fail to find the Firm's Name in this record. It then searches for the matching parent record, with the same link code of BUF and looks there to find the data with a reference code of F, in this case "British United Freight".

Advantages Of Relational Files

The most obvious advantage of a relational file is that it saves on memory space and elbow grease. All you need to do is enter your parent data once and it appears as though it was typed in with each of the child records.

It also means that you can display and print your data in a much more efficient way. Consider the record album example. If this was a simple list file you would have had to enter the name of the recording artist EVERY time you catalogued one of the albums. Later if you wanted to produce a list of all the artists in your collection you would find that each name was printed out as many times as you have an album made by them. In the example the name Ella Fitzgerald would be printed 23 times! By designating the recording artist as a parent all you have to do is select 'parent records only' and then ask for a print out. Each name only appears once in the list.

Another advantage appears when you use the same data reference code for a field in both the parents and the children. When Masterfile tries to display that field it will print the version in the child record in preference as long as it is present. If the field is absent from the child Masterfile prints the text held in the parent record. Thus we have a simple and neat way of arranging for a given piece of text to appear in the display as a 'default' whenever the entry is missing from the child. We saw a use of this in the garden plants example above. Another situation could be in an address file where whenever there is no telephone number field in the child the parent would print something like 'They are not on the phone'.

The more data you can manage to fit into the parent rather than the child the more memory efficient your data will be, so using a 'default' data field in this way can also be very useful from that point of view.

You will also see later that by designing a display format which places parent data in what is called the header area you can produce an automatic screen/paper change every time the parent record changes. Don't worry about terms such as 'header' just yet, all will be explained in the next section.

Arranging the Data on Screen or Page

You may remember we said that, within the limitations of the 80 column screen, Masterfile is completely flexible in the way in which you can display or print your data. However you may also have realised that the price of this flexibility is that once you have entered your data you will not be able to display any of it UNTIL you have given the program some basic ground rules about how you want the information arranged.

The way we set up these ground rules is through the creation of a display **FORMAT**. A format is simply a collection of instructions to Masterfile about which part of the file data is to be shown on screen, where to put it on the screen, whether to add titles and headings, whether to put ruled lines on screen to make things easier to read, and also how to print the data out on paper. These instructions are collected in a fairly painless way through the use of menus and questionnaires.

It may seem that there is a lot to think about at first but you will soon get the hang of things. A crude format that simply throws all data on screen, allowing you to review and modify it, can be set up with very little effort. You can then spend as much time as you want creating deluxe versions for presenting the information in highly professional ways.

One of the nicest things about this system is that you can define a whole set of formats for any one data file, each of which calls up and displays different aspects of the data. For example in an address index you can have one format that shows a person's name, address, home telephone number, work number, birthday, whether they sent you a card last christmas etc. You may well also find it convenient to have a format that just displays name and telephone number and you will be able to switch from one style of display to the other in just a couple of keypresses.

Format switching is also useful when you want to, or have to, display information over more than one screen at a time. Consider the example of a file of customer details, name, address etc. You can use a simple format display as a brief index for flipping through the records quickly. Once you have found something that may be interesting you can switch format to a display that prints far more detailed information e.g. records of purchases, guarantee expiry etc.

If you have created a relational database it is usual to have a least two formats defined, one for the parent records and one for the child records (which of course can include some parent data). A common slip in such cases will be to attempt to show child data using the parent format or vice versa, or having both parent and children selected at the same time. The result will show as duplicated records in the display or as records lacking in detail.

Each format is identified by a simple reference letter or digit. This has no connection with the data reference code but it works on a similar principle.

Creating a Display/Print Format

Step One - the format menu

From the Main Menu select option 'F' and you should be presented with the format menu which looks like this.

Format report

```
New format.....N
Review format.....R
Erase format.....E
Copy format.....C
Exit to main menu.....X
```

File: FILE3 Records:0017 Selected:0012 Parents:0005 RAM used:02K from 64K

The various options are pretty self explanatory. 'E' lets you erase an existing format that is no longer wanted, and of course you are prompted for confirmation. 'R' lets you review a format so you can make changes or remind yourself of how it was set up.

'C' copies an existing format into one with a different identifying code. It is designed to help you to set up a format that in most respects is similar to one that has already been defined. It is therefore a labour saving device. You are asked to give the reference of the format that you wish to copy, followed by a prompt for reference by which the new copy is to be known. If the first format does not exist, or the second code has already been used then COPY is abandoned. If all goes well however you can use the R *Review* option to make the required changes to the new format.

At the moment all we are interested in is the first option, N to create a New Format. Press this key and you are prompted to enter the reference code for this new format. The screen should then change to display a screen known as the Report Geometry Questionnaire.

Four kinds of questionnaire are used to specify a complete screen format. The first (compulsory) one is used to specify the Report GEOMETRY. The other three are for: static text such as HEADINGS, DATA retrieved from the file, and RULED LINES. These three are all optional and there can be any number of them and in any order. Each questionnaire is responsible for one ITEM of a report format. The very simplest report will need at least the Report Geometry item and one Data item.

Step two - the report geometry item.

Just think of the Report Geometry as controlling the OVERALL LAYOUT of the display. What it does is to define the broad divisions that the page or screen is divided into when showing the data, together with certain other details such as colours and title.

The questionnaire is already filled in with default values and you may wish to leave these exactly as they are. If, however, you decide to make changes you will see that we have a familiar menu of options at the bottom of the screen. By now you should be sufficiently conversant with these to go straight for A:Alter.

As soon as you press **A** the menu line should disappear and a diamond shaped marker will appear next to the first line of the questionnaire. This shows you which line you are changing at any one time. To bypass a line LEAVING THE DEFAULT VALUES UNCHANGED just press **[RETURN]/[ENTER]**. To bypass all remaining lines and return back to the menu choices (A:Alter etc.) press the **[ESC]** key.

Format report

1 Report geometry

```
Heading area depth.....01
Record area depth.....02
Forms depth.....66
Single sheet feed.....N
Forms margin.....00
Border colour.....19
Pen colour.....00
Paper colour.....23
Title.....DEALERS AND REFERENCE CODES
```

A:alter E:erase I:insert item N:next item D:Display X:exit

File: FILE3 Records:0017 Selected:0012 Parents:0005 RAM used:02K from 64K

If you want to make a change to one of the lines simply type the new value in at the prompt followed by **[RETURN]/[ENTER]**. An invalid response is signalled by a BEEP and you are prompted to try again.

Headings and Records

To understand the report geometry questions fully we have to appreciate the difference between a **HEADING AREA** and a **RECORD AREA**. In general the Heading Area appears at the top of the screen/page and contains text that is common or pertinent to all the displayed records, such as column titles. Each record area will contain data that is pertinent to only one record in the file.

The heading area is only printed once per screen or page of paper. Usually the Record Area is repeated as many times as it will fit in to the remaining space, containing information from a different record each time, before a new 'page' is forced.

We also need to learn the meaning of the terms **HEADING TEXT** and **RECORD TEXT**. Record Text is of course the information held within our file records. Only chosen fields from each record will be displayed.

Heading Text consists of information entered when you define the display format. This text is used only to clarify and improve the display e.g. as a title or explanatory comment, it is not used by the database at any other time.

Heading text does **NOT** have to be inserted into the Heading Area, Record Text does **NOT** have to be inserted into the Record Area.

If we insert heading text into the record area it is repeated on the screen or page as many times as the record area is repeated.

We can also insert record text into the heading area. The result of this is that every time this record text changes a new page/screen is forced. You will probably only want to do this with record data obtained from a parent record of a relational file since this is intended to remain the same over more than one child record. Arranging things this way is a useful system for forcing a new page with every different parent. If you place record text that is **NOT** taken from a parent record into the heading area Masterfile will only produce single-record displays or pages. Try it and see what happens if you find this hard to follow.

Let us work our way down the lines of the questionnaire to consider the various possible responses.

Heading area depth:	The area at the top of the screen/page is the heading area. It can be 0 to 10 lines deep with a depth of 0 lines meaning that there is no HA.
Record area depth:	Specify 1 to 21 lines deep. The record area must be at least one line deep.
Forms depth:	The forms depth is used to specify how many lines there are per page of printer paper you are using. For standard continuous printing paper (11 inch) and standard line spacing the correct figure is 66 lines. You are free to specify values in the range 1-99 but 99 is taken to mean that you are using an 'infinite page' i.e. no provision is made to repeat headings or take account of page gaps.
Forms margin:	This controls how many printer columns to use as a left hand margin before the text is printed. What this means in real terms obviously depends on the printer pitch you are using. The forms margin has no effect at all on the screen display, only on printed output.
Single sheet feed:	The default option is taken as continuous paper but if you specify that you are using single sheet then Masterfile will pause at appropriate points to allow a paper change. Pressing any key will resume the print.
Border colour:	These colours operate only during Display Mode i.e. when showing the data. For the rest of the time the normal program colours are in force. The possible range is 0-26 as defined in your CPC manual or on top of the disc drive on the 6128/664.
Pen colour:	0-26 as above.
Paper colour:	0-26 as above.
Title:	This can be any text. It is centered in line 1 of the screen display but is not printed on paper. The title is used to identify each format in the 'List Titles' option of Main Menu.

When printing records on paper other than 'infinite length' we can calculate the number of records that will appear on each page in this way. At the top of each page the header area is printed, followed by as many of the record areas that will fit on, followed by a six line gap to start a new page before the header text is repeated again. The number of records on a 66 line page is therefore: 66, less heading area depth, less 6, divided by the record area depth.

Having entered all your choices for the above options, or having pressed the [ESC]ape key, you will be presented again with the menu line on the bottom of the screen.

Step three - the heading questionnaire.

Having defined the overall layout of our screen or page the next step is to fill the blank spaces with information. To do this we must press option I on the menu line which stands for Insert Item. There are three kinds of item that we can insert into the space, headings, records and ruled lines, and pressing I will give us a second menu from which we can choose one of the three.

Format report

1 Heading

```
Hdg(0) or Rec(1).....00
Column.....01
Line.....01
Inverse.....N
Text.....VARIETY NAME
```

A:alter E:erase I:insert item N:next item D:Display X:exit

File: FILE3 Records:0001 Selected:0000 Parents:0000 RAM used:02K from 64K

Each of these items has a questionnaire of its own which is answered in the same general way as with the Geometry questionnaire. Make your choice from the menu or back out by pressing [RETURN]/[ENTER]. Let us follow the order suggested above and press H:heading.

You should then be presented with the following Heading Questionnaire which we will work through question by question.

As explained, headings are pieces of text that appear in the database during Display Mode only, and only in association with the format where they were defined. They are there to let you add titles and comments to the data and there can be as many of them on screen as you want.

When you are entering a piece of header text the first question is

Hdg(0) or Rec(1):

What Masterfile wants to know is whether the text is to appear in the header area at the top of the screen (press 0) or in each record area (press 1). In the first case the text is only printed once per screen/page. In the second case the text reappears as many times as there are record areas on that screen/page.

The next two questions are

Column:

Line:

Column refers to the number of the screen column from left to right at which the text starts to print, in the range 1-80. Line refers the screen line from top to bottom WITHIN THE SPECIFIED AREA that the text starts to print. This is an important point, the line number is counted from the start of the header or record area that the text is in and NOT from the very top of the screen.

The next question is

Inverse:

Answer N for normal print or Y for inverted pen and paper colours. This appears on screen only, not on paper even if your printer could handle it.

Finally we have

Text:

This is where we enter the heading text itself which is reproduced on screen from the given start point exactly the way it was typed. Because the Heading Text has no other function except to appear on screen we can fragment it over as many lines as we like.

Note that, since it is possible to enter heading text into the record area, if there is only room for one record per page then there is no particular need to have a Heading Area at all.

Step four - the record data questionnaire

The record data questionnaire performs a very similar function to the heading data questionnaire, it controls which text is placed where on the screen/page. However you will see that there are also one or two very important differences.

Format report

1 Record data

```
Data reference.....?:Un-named data...
Hdg(0) or Rec(1).....01
Column.....01
Line.....01
Width.....40
Depth.....01
Inverse.....N
Right-justify.....N
Numeric.....N
Column total.....N
Two dec.places.....N
Thousands commas.....N
Filler if absent.....-
Leading symbol.....
```

A:alter E:erase I:insert item N:next item D:Display X:exit

File: FILE3 Records:0001 Selected:0000 Parents:0000 RAM used:02K from 64K

Like the Heading Questionnaire we will probably have to use this section many times when creating one format in order to put all the required data into its correct position on screen.

The first question is

Data reference:

This simply wants to know which field within your records is to be retrieved and displayed. It is at this point that you will wish that you had taken the chance to make a print out of all the data references and data names. If the code that you enter has been assigned a data name then Masterfile will print this name up next to the question so you can check that this is really the field you wanted. If the reference code has not been assigned a name then you will get the message 'Un-named data'. Note that Masterfile will not stop you from entering a code that has not been previously defined, and which has not yet had any data associated with it. This may be what you intended to do, but normally giving every field without a data name the 'Un-named data' message is a useful error catching feature.

It is possible to specify the same data reference to appear more than once in a given display format. This has the obvious effect of making the same text appear more than once.

The reference code itself does not appear on screen.

The next three questions are the same as those we have met before

```
Hdg(Ø) or Rec(1):(default is 1)
Column:(1-8Ø)
Line:(1-21)
```

These obviously control the positioning of the data on screen but we also have two extra options

```
Width:
Depth:
```

Width stands for the screen width (in columns) of the block in which the text is to be displayed. Depth stands for the screen depth (in lines) of the block. Together these two figures define screen areas similar to Locomotive Basic's windows. This is because unlike Heading Text which appears on screen exactly as typed Record Text can undergo a form of word processing. After all it is seldom convenient to enter record text into the file in exactly the way we want it to appear on screen, and impossible if you want to display with a variety of formats.

Word-Processing

Word-processing has the following effect on the text. First leading spaces are omitted. Secondly word breaks are minimised within the defined window. If there is room the text is only broken at the spaces between words rather than in the middle of the word. If there is room available a new line is forced at every line break code (the **[SHIFT]-ZERO** character '_' that has been entered. Line break codes are not displayed and if they cannot force a change of line they just display as a space. Any sort-key control character '\' present in the text is also displayed as a space. If there is not sufficient room in the defined window to show all of the data at once then the text will be truncated.

With the exception of line break and sort codes Masterfile will only recognise a space as a 'word delimiter'. What this means is that something like 'Baubles,bangles.Beads(glass)' is understood to be just one word; punctuation on its own is not sufficient and will not be selected as the point for a line break.

The above rules ensure a straight left edge to the text but a ragged right edge.

The next two questions are

Inverse:
Right-justify:

Both of these are answered with a Y/N response. Inverse we have met before, Right-justify is only operative when the defined window is only one line deep. It means that the data hugs the right hand edge of the window rather than the left and is useful for improving the layout of columns especially of numeric data, financial records etc.

Numeric editing

The following questions are all closely related

Numeric:
Column total:
Two dec. places:
Thousands commas:
Filler if absent:
Leading Symbol:

A FILLER is a one character code such as '*' or '-' that is printed three times on screen if the field to be displayed is missing from one of the records. In many text records a missing field will not necessarily look out of place in the display but with numeric data it is often important to demonstrate exactly when something is absent from where it should be. Most of the remaining options are answered by a Y/N response and they all only become operative if Y is replied to the 'Numeric:' question.

If you are using Masterfile for text data only then you have no need to come to grips with the numeric editing options and can feel free to skip the rest of this section. Just leave the default values for the above questions by pressing the [ESC]ape key.

'Numeric' treatment gives us the option of performing some specialised editing and calculations on the data. Even if you type Y at this option it will only come into force if field depth is set to 1 and the data in the specified field LOOKS numeric to Masterfile i.e. it has to consist only of numbers with one optional decimal point. It must be unsigned and there must be no currency symbols or trailing spaces.

Once the numeric option has come into play leading zeros are removed. Unless you have answered Y to the 'Two dec. places:' question then the data is stripped of decimal places entirely. There is no rounding. Two decimal places are provided for currency uses. 'Thousands commas' are pretty self explanatory. The 'Leading Symbol' options prompts you to enter a symbol to prefix the number which again is intended for currency data e.g. '\$' or '£'.

The final option to discuss is 'Column total'. For data to be totalled it must qualify for numeric editing as described above and both the 'numeric' option and the 'column total' option must be answered with Y. The specified data field in all the SELECTED records is added together and the result is produced one line after the last selected record in the same style and vertically in line with the data being totalled. The word Totals: is written on screen to the left of this.

Any number of the displayed fields in a format can be totalled separately.

The data is not added together until the last selected record has been displayed so there may be a short pause before the total appears. This total is recalculated every time data is displayed so new additions to the number of selected records are automatically included.

If the totals line cannot fit onto the last displayed screen you are given the prompt **[ENTER] for totals...** If you still want to see the total then press the **[RETURN]/[ENTER]** key. However if you press any other key the totals option is disabled so that the last page of records remains on screen and available for alteration.

If you have a large file and are only interested in viewing the totals then Display Mode offers the menu command L that takes you to the last selected record and hence to the totals.

If you ask for a printout of the data in Display Mode then any column totals will also be printed in the same format as seen on screen.

If there is data missing from some records then a value of zero is inserted in its place. No warnings are given of this but you can use the Search Mode to find missing values. Any non-numeric data that has been included in the total by mistake is ignored but its presence is demonstrated by a BEEP. Only one BEEP is given every 256 bad fields to keep things peaceful if you try to total 500 addresses! Such non-numeric data can be hard to spot. You may have used a letter 'O' rather than zero or there may just be a trailing space in the data. To help overcome such problems Masterfile provides the special option in Search Mode to find 'non-numeric' data in a specified field.

Once you have included all the required data and headings in the format you can consider adding the final touches to smarten everything up. In particular ruled lines can be used to increase the clarity of the display and to emphasise certain features.

Step five - the Ruled Line Questionnaire

Format report

1 Ruled line

```
Across (Y) or down (N)...Y
Mid-char ends.....N
Double thickness.....N
Start column.....01
Start line.....02
Length.....79
How many.....02
Interval.....20
```

A:alter E:erase I:insert item N:next item D:Display X:exit

File: FILE3 Records:0001 Selected:0000 Parents:0000 RAM used:02K from 64K

When choosing to add lines to the screen there are certain rules that have to be considered.

All lines are drawn in a mid-character position, horizontally and vertically. When the lines come to an end they can extend to the edge of the last character square that they cross, or again to mid character. The former may be preferable if you are just creating a dividing line, the latter is used to ensure clean corners when you want horizontal and vertical lines to meet to create a box effect.

Lines ignore HA/RA boundaries and are specified as if the whole screen were one window and can appear anywhere on screen. But you are advised to avoid the bottom three lines as these are used for program messages.

In Display Mode the lines are drawn before any text is written so that the data overwrites any line that it meets.

You have to raise a Ruled Line questionnaire every time you want to add a new line of different length or direction to those specified previously but it is possible to create parallel lines of the same length and at a regular spacing in just one questionnaire.

Here then are the ruled line questions, they should be pretty self explanatory if you have understood the above.

Across (Y) or down (N) : (Y for horizontal, N for vertical)
Mid-char end: Y/N (Y gives tidy corners)

Double Thickness:	Y/N (Y is best for vertical matches, N for horizontal)
Start Column:	Specify the column 1-80, from left to right, in which the lefthand or top of the line should start.
Start line:	Specify the line 1-25, from top to bottom, in which the lefthand or the top of the line should start.
Length:	The length should be specified in character squares, 1-80.
How many:	Up to 80 lines can be drawn in one go. This maximum number could only be used with vertical lines but could be used to give an unusual textured effect.
Interval:	If you are specifying multiple parallel lines you must also specify the distance, in character squares, between them.

Step six - correcting a format

Each time you have finished entering an item in one of the above three questionnaires you should have been prompted with the same menu as appeared at the bottom of the report geometry screen. Each time you saw this you should have chosen I:Insert until your format contained every item you wanted.

Now that you have finished Inserting your items we can go on to discover what each of the remaining menu items are for.

Say you have defined a format with 1 report geometry item (there can only be one), 10 header items, 20 record items and 5 ruled line items.

By pressing N:Next item we can step through all 36 of the above one by one, in the order they were entered, to look at, erase or modify them. N has a cyclic action, when you come to the end of the ruled line items the next keypress will take you back to the report geometry screen. If you try pressing N on the report geometry screen before you have defined any other items it will not be surprising to see that nothing happens.

A:Alter is self evident - it is to let you make small changes to any of the entries made in one of the questionnaires. Alter works on the item that is visible on screen at that time.

E:Erase lets you erase the item that is visible on the screen at that time. The only item that cannot be erased is the report geometry questionnaire.

X:Exit takes you back to the Format Menu from where you can create a new format or return to Main Menu.

D:Display takes you straight to Display Mode where as long as one, and preferably more than one, record has been entered and selected you will be able to see the effect of your format choices on screen. If you have gone to display mode from the format mode, rather than from the Main Menu, you are given the extra menu option of Direct Return To Format. This gives you the ability to toggle quickly between format and display until you have got things arranged exactly the way you want them.

You may want to switch straight to Display Mode every time you add an item to your format, just to check that it looks the way you want it to. An alternative approach is to plan out the display before hand on a sheet of graph paper.

Creating complicated formats may seem like a lot of unnecessary bother at first but if you want to convince yourself it is worthwhile load the three sample files on the disc File1, File2 and File3 and see how professional your data presentation can be with Masterfile. Review the format items of these files and see how it was all done.

Example of Format Creation

In this example session we are going to experiment with creating simple formats to display the garden plants example given earlier in the Section on Relational Data. To begin with let's just start with a very crude format to display all of the information on the screen.

If you haven't done so already enter the data given in the example and use the Main Menu option S to select Child records. You will notice as the example progresses that Masterfile will obtain and display requested data from both the Parent and the Child records.

Next choose the options to create a new Format, giving it a reference code of 'A'. As we create our Format display use option D to move between the format and the display at frequent intervals so you can check the effect on screen.

Going to the Report Geometry item first press A:Alter and answer the questions in the following way :-

Let us set the heading area to 0 and the record area to 5, which should give us four records on screen at any one time.

Leave the choice of colours and the printer (forms) settings as they are to begin with.

The title we can put as 'Garden Plants'.

Having done this choose the 'I:insert item' option from the menu that appears.

In our very crude first display we will not bother with any header items (explanatory text) so go straight to the record data items. We have no Heading Area so our data will have to go into the Record Area.

The simplest display is to have each of the data fields appearing on a separate line. Line 1 can contain the species name so we choose the data reference of S and position it in line 1, column 1. It should have a depth of 1 and a width of 80. We will have it in normal text, not right justified etc. so back out of the remaining options using the [ESC]ape key. Select the 'I:Insert item' option for each of the data fields that we want to insert in turn and repeat the process above, putting each of the remaining options on a new line, except for common name which we will also insert on line 1, specifying a start column of 60 and a width of twenty. We will see that it doesn't matter that this defined 'window' overlaps the previous one on this line, although any text for species name that extends past the column 60 will be obscured.

When you have finished exit to the Display mode using option D and you should see something like this.

```
(G)                                GARDEN PLANTS
Acer pseudoplatanus                Sycamore
'Purpureum'
A bushy rounded deciduous tree, ultimately of large size.
Leaves purple on the underside

Acer pseudoplatanus                Sycamore
'Moorlei'
A bushy rounded deciduous tree, ultimately of large size.
Leaves are a soft yellowy green.

Acer pseudoplatanus                Sycamore
'Brilliantissimum'
A bushy rounded deciduous tree of small size.
Leaves are an unusual shrimp pink colour in spring.
```

(H to see menu options)

```
File: GARDEN   Records:0004   Selected:0003   Parents:0001   RAM used:01K from 64K
```

Simple, but not very impressive. Lets try to build up a more showy display. First of all press option D again to return to format mode.

Use the 'N:Next item option' to step through the various screens until we come back to the Report Geometry. Press A:Alter and step down the screen options to create a Header Area of 5 lines. We can reduce much of the unnecessary duplication of information by inserting parent data into the Header Area.

Press [ESC]ape and again 'N:Next item' to get to the Species Name item. Press A to alter and change its position to the Heading Area, line 3, column 23. We can also choose the option for Inverse Text. Do the same with the Common Name to place it immediately below the Species Name.

Now lets add some explanatory header text in each of the record areas. Choose I: Insert item, Header Text, Record Area, Line 2, Column 3, Inverse Text, with a text itself of 'VARIETY NAME:'. Repeat this operation on consecutive lines adding text in each case of 'GROWTH HABIT:' and 'COLOUR:'.

The next thing we have to do is step through the various remaining Record data items adjusting their column position to take account of the added Header text and the ruled lines. In each case a column setting of 18 should be sufficient. They should be left in the record area, lines 2,3 and 4, but the width should be reduced to 60.

For the final effect let us add some ruled lines. I: Insert Item, L for Lines. Although we will be drawing 16 separate lines on the screen we can use the option for producing parallel lines to create our screen in just seven format items. Remember that the lines work on a screen basis, column and line counts are independant of the chosen Heading and Record Areas.

The first lines we will draw are to produce a box around the text in the Heading Area. Because we are producing boxes on screen we shall use only 'mid-character lines. Fill out the questionnaire with these answers Y,Y,N,20,03,40,02,03. Then select I: to insert another item and give the answers N,Y,N,20,03,03,02,40. Use option D to return to the Display and look at the box that has been drawn.

To finish the display return to Format and insert five more lines items with these answers - Y,Y,N,01,07,79,03,05; Y,Y,N,01,11,79,03,05; N,Y,N,01,07,04,02,79; N,Y,N,01,12,04,02,79; N,Y,N,01,17,04,02,79.

The end result should look like this

Q

GARDEN PLANTS

Acer pseudoplatanus
Sycamore

VARIETY NAME: 'Purpureum'
GROWTH HABIT: A bushy rounded deciduous tree, ultimately of large size.
COLOUR: Leaves purple on the underside

VARIETY NAME: 'Woorlei'
GROWTH HABIT: A bushy rounded deciduous tree, ultimately of large size.
COLOUR: Leaves are a soft yellowy green.

VARIETY NAME: 'Brilliantissimum'
GROWTH HABIT: A bushy rounded deciduous tree of small size.
COLOUR: Leaves are an unusual shrimp pink colour in spring.

(H to see menu options)

File: GARDEN Records:0004 Selected:0003 Parents:0001 RAM used:01K from 64K

Experiment by altering the Format Items to display the data in different ways and different positions on the screen for example by answering no ('N') to the question for mid character lines.

Section 4.

The Existing Database

Chapter Contents

Looking at the Data

Display Mode

Positioning the Display

Top Records

Printing Records

Other Display Menu Options

Updating the Data

Manipulating the Data

Searching the File

Sorting the File

Looking at the Data

If you have worked your way this far through sections 1 and 2 you will be pleased to hear that the hardest part is over. Once you have inserted the data names and designed the format you will find that the process of inserting and amending data runs very smoothly.

The next thing you will want to do is have a look at the data on screen to make sure that the choices you have made in format mode are what you want, and that there are no errors such as truncated records. When testing a format in this way it is advisable to have quite a large representative sample of records available to display so that you can be sure that a given data window is really as large as necessary. When a new record is added to the file consider whether the data in each field is unusually large and may perhaps require a revision of the display format.

In case you haven't realised by now, the part of the program that allows us to see the data on screen, or print it out, in the arranged format is called Display Mode.

Display Mode

Display Mode can be entered directly from Main Menu, or from search mode and in these cases the format used for the display will be that which was used most recently. (Even if you have just loaded your file Masterfile will have made a record of which format was current when it was saved).

You can also enter Display Mode from the 'C:List Titles' option on the Main Menu or from Format mode and in these cases the format reference will have been asked for explicitly.

Therefore if you have come to Display Mode from Format Mode, Masterfile automatically makes the last created or modified format the current one for use during the display. This is to allow you to switch rapidly between Format and Display Modes until the format definition is fully debugged.

If you have entered Display Mode with no formats defined then all that Masterfile can do is warn you of that fact and return you to the Main Menu.

If there are formats defined then when entering Display Mode you will see the following.

At the top left of the screen, line 1, column 1, is the format reference code printed in inverse lettering. In the centre of the same line will be the title of that particular format as given on the report geometry screen.

If no records have been selected then that will be all you see. No headings, data or lines will be printed **EVEN IF THEY HAVE BEEN DEFINED IN THE DISPLAY FORMAT.**

If some records have been selected then the headings are shown and the lines are drawn. Finally the required fields from the selected records will be placed on screen in the specified positions and given the appropriate word processing or numeric treatment.

Directly below the Title will be the Heading Area, if there is one, and below that will be the Record Areas. Each Record Area is repeated for each selected record in turn, until the screen or page is full. The only exception to this rule is if you have placed record data (usually from a parent record) in the Heading Area in which case a change of page/screen will be forced more often. A single record cannot take up more than one screenful of room without changing the format midway to display the rest of the fields.

The display will start from the first selected record. If there are more records selected than can be shown on the one screen then at the bottom left of the screen will appear the message

...more...

Finally, also on the bottom left, there will always be the message

(H to see menu options)

Like almost every section of Masterfile Display Mode provides you with an extensive selection of menu choices. However for obvious reasons it is important to keep the display screen as clear as possible so whilst the menu is there at all times, waiting for your choices, it will only become visible when you press key H.

Do so now and the following should appear.

Ⓜ

GARDEN PLANTS

```
ENTER for next screen page.....
1-9 records forwards.....
Back 1-9 records.....-
1st selected record.....F
Last selected record.....L
Alter top record.....A
Erase top record.....E
Copy top record.....C
Unselect top record.....U
Print.....P
Search the file.....S
Switch report format.....R
This menu.....H
Direct return to format.....D
Exit.....X
```

(H to see menu options)

File: GARDEN Records:0004 Selected:0000 Parents:0001 RAM used:01K from 64K

We will work through the first five of these in order as they are all there to allow you to control which of the selected records are shown at any one time. Note that if no records are currently selected then most menu options are ignored.

Positioning the display

The [RETURN]/[ENTER] key is used to step through the display screen by screen. As long as you have the message '...more...' visible on the screen you will know that there are more records to see. Progress through the records is not cyclic, once you have reached the end you are not automatically returned to the beginning again.

To move forward by 1-9 records all you have to do is tap the number key which corresponds to the size of the jump you want to make.

To move backwards by 1-9 records you must first tap the minus key '-' (minus is found below the equals sign '=') followed by the number of the jump that you want to make. Normally it doesn't matter if you use the numbers on the main board or those on the numeric/function key pad but if the latter keys have been redefined to produce a different character or string of characters then of course they can't be used.

Any attempt to overshoot always shows the last or first record depending on the direction chosen.

Pressing key **F** will take you to the first selected record, pressing key **L** will take you to the last record.

The next three options are designed to let you amend the data displayed and will be dealt with in the section on Updating Your Data.

Top Record

Before we go any further it is necessary to explain what is meant by the 'top record'. It is simply the record currently displayed in the top-most Record Area of the screen. We use the 'top record' definition as a means of identifying data that is to be amended, erased, printed etc. You must use the above commands for positioning the display to choose which record you want to be currently 'top'.

Option **U** from the display menu does exactly what it says, it removes the top record from the selected list. This is the only option available that lets you remove a record from selected status on a completely arbitrary basis, i.e. using a criteria that cannot be expressed to Masterfile in a logical way via the Search Mode menu. It can of course be used in a logical way as well but is only efficient when you have just a few records to unselect. Option **U** does NOT erase a record from the file.

Printing records

- starts to print the selected records to paper using the same display style as shown on screen with the exception of the title line, ruled lines or the program messages such as '...more...'. Inverse text appears as normal.

The number of record areas that appear on a page is governed by the 'forms depth' option of the report geometry questionnaire. It is not simply a copy of the screen. To reflect this the display clears and each record is shown one by one on screen before being sent to the printer. The text is given a left margin on the paper as determined by the forms margin question.

Printing starts at the current top record on screen and continues to the last selected record unless interrupted by the **[ESC]**ape key.

Other Display Menu options

Option **S** will take you direct to Search mode from where the 'selected' status of the records can be altered depending on the criteria you choose.

Option **R** prompts you to specify the reference code of a format display that you wish to replace the one currently in force. The current 'top record' remains at the top when the switch has been made. This means that there are certain very useful effects that can be achieved. For example you can use the first format as a simple index system for the records, flip through these until you find one that interests you and by switching formats you will be able to reveal all of the remaining fields in much more detail. A similar use occurs when there is simply too much data in a record to fit onto one screen at a time so you can use the second format for the overflow. It takes just two key presses to switch the display in this way.

H is the option you choose when you want to display the **HELP** menu. This option is the only one that remains on screen at all times. Once you get used to the various Display Mode commands you will not need to show this menu at all.

Option **D** takes you back to Format Mode at the item questionnaire that was on screen when you came to Display Mode. It therefore follows that if you entered Display Mode by some different route then pressing option **D** will have no effect. It is designed to let you toggle rapidly between the format and the display so that you can design the screen layout on a 'try it and see' basis.

The final option **X** takes you back to Main Menu irrespective of the route taken to get to the Display Mode.

Updating the Data

After you have entered all the data in a new record (option **A** from Main Menu), and have declined the opportunity that is offered then to make corrections, you will only be able to amend or update the records via the Display Menu.

In other words you must look through the selected records, either changing each one in turn or identifying those that need changing on an individual basis. However some users may require that **ALL** records are updated on a regular and predictable basis, and sometimes in a regular and predictable way. If that is so it may be worth your while creating a User Basic program that does all this hard work for you. See the Advanced Uses section for more details.

There are three options we have available for amending records available from the Display menu. All of these work on the **TOP RECORD**.

Option **E** erases the entire top record (and not just the displayed fields). To confirm erasure, press **Y** as prompted, else change your mind by pressing any other key.

Option **C** creates a record exactly the same as and adjacent to the top record. The display is resumed at the first of the identical records. You can then use option **A** to alter one of these. This is a useful labour saving device when many records have data that differs only slightly from one to the other.

Option **A** takes you to a screen which is titled **UPDATE**. On this screen will be displayed all of the data from all of the fields directly available in the top record. All fields are shown irrespective of whether they were displayed in the current format. Note that if the top record is a child, then the parent fields are **NOT** displayed as well.

The data is displayed in a 'raw' state i.e. it is not word-processed or edited and line break and sort codes are shown. Each field is prefixed by its data reference code.

At the bottom of the screen you are given some familiar menu choices.

I:Insert allows you to add a new field to the record. You are prompted to give the data reference code (if this has already been used in this record the insert is abandoned) followed by the field text. Again you are allowed to enter a data reference code that has not been previously defined in the program but it is not automatically added to the data names list.

E:ErAse will clear the specified field from the record.

A:Alter will allow you to edit the specified field. The text of that field is copied into the bottom of the screen and the Masterfile text editing facilities (see Entering Your Data) can be used on it.

Manipulating the Data

Once all the data has been entered into your files in a completely satisfactory way there are two possible treatments you can perform on it.

Firstly you can **SEARCH** the data. Search allows us to select or unselect each record on the basis of the data it contains. Unlike some other databases, Masterfile's search works on the basis of identifying all matching records, rather than simply positioning the display at the first matching record.

Secondly you can **SORT** the data into a specified order in the file itself. This affects the sequence in which records appear during Display or printing but does not affect their selected status. Even unselected records are sorted but if you later add new records they will be put at the end of the file and you may have to perform the sort again.

Searching The File

With small files it is feasible to use the database in exactly the way you would a card index, you can flip through looking for those records that have the information you want. With large files however it makes a lot of sense to get the computer to do all of this tedious work for you quickly and simply. We do this by **SELECTING** a subset of the records on the basis of their contents. After this point all **UNSELECTED** records are to all intents and purposes invisible until we reselect them.

Search Mode can be selected either from the Main Menu or from Display Mode by choosing option S. From the search you can return to the Main Menu so you can see the effect on the **SELECTED:XXXX** status line, you can return to Display Mode so that you can view the selected records, or you can perform another Search on the remaining records.

By performing repeated Searches in this way it is possible to select or unselect records on the basis of very complex criteria. For example in a club members list you could select all records with an address field that includes a given town, then unselect all of the remainder that haven't paid their last dues, then unselect all those that aren't on the phone and so on. Alternatively to find all records with a field numerically in the range of 100-199 first select all records greater than 99 and then unselect all those greater than 199.

Once records are selected or unselected they remain so until you take positive steps to change the situation. The select status of a record is even preserved when the file is saved and loaded.

Remember that many operations only work on the **SELECTED** records; display, print, data export are all examples of such.

The first menu that we see when entering Search Mode is this

Search the file

Select.....	S
Un-select.....	U
Display.....	D
Exit.....	X

We also return to this menu every time a search has been made and you can then press **X** to return to Main Menu, **D** for Display, or choose another search.

By pressing either of the first two choices you are telling Masterfile whether the search is aimed at selecting records, **S**, or at unselecting them, **U**.

If you press **S** therefore only **UNSELECTED** records are examined, with the aim of flagging some of them as selected. Conversely if **U** is pressed then only **SELECTED** records are examined with the aim of unselecting some of them. Before making one of these choices consider whether you should have unselected or selected the whole file, using Main Menu option **R** to reset, to make sure that the search covers every record.

You are then presented with the second of the search menus as follows. Remember that the result of the choices you make here depends on whether you chose **S** or **U** at the previous menu.

Search the file

Parents.....	P
Children.....	C
Orphans.....	O
Childless parents.....	B
Data compare.....	D
Prev menu.....	X

File: GARDEN Records:0000 Selected:0000 Parents:0000 RAM used:01K from 64K

'X' is self evident and is really here to let you change your mind about the select or unselect objectives of the search, or to back out of the search altogether.

The first four options are quick and useful ways of isolating sections of a relational file.

P identifies all records that are parents, i.e. that have a '>' field.

C similarly identifies all records that contain a '^' field.

O (letter 'O') identifies any child records who have a '^' field followed by a code that isn't matched by a similar code in any of the parent records. These parentless records are called 'orphans' and can result from simple typing errors when entering the '^' field. Option **O** can therefore be a powerful trouble-shooting aid.

B is the opposite of 0, it identifies any parent records that do not have associated children. Again this may be the result of an error, but in some applications it may be a deliberate choice.

Once you have made one of the above choices you will be returned immediately to the Search Menu and the Selected:xxxx status will be updated. If you have made one of the above choices when you have not got a relational file then the result is that all records will be selected or unselected.

The final option available is D for Data Compare. This is the choice that we make when we want to select records on the basis of the INFORMATION that they contain. It is also the ONLY option that is really useful when we have a non-relational file.

Having chosen D we are first prompted to specify the reference code of the field within the records that you are going to search e.g. 'A' may be chosen to search the address field. After this we are presented with a final menu which allows us to specify exactly the basis on which the search should be made.

Search the file

Equal.....	E
Less.....	L
Greater.....	G
Unequal.....	U
Present.....	P
Absent.....	A
Non-numeric.....	N
Scan.....	S
Prev menu.....	X

File: GARDEN Records:0000 Selected:0000 Parents:0000 RAM used:01K from 64K

'X' is simply a back out if you have made a mistake.

'P' looks through each record to see whether any data at all is present, irrespective of what it is, in the specified field.

'A' does the opposite, it looks to see whether the data is absent from the specified field.

'N' searches the given field of each record to see if the data is classified as non-numeric (see the section on column totals in Arranging The Data if this term is unfamiliar). You would only choose to use this option on fields which ARE intended to contain numeric data and it is thus simply a means of finding typing errors etc.

The remaining menu options all work by comparing the contents of the specified field with a given string of text or or numeric value, called an **ARGUMENT**.

For example option **E** prompts you to give the appropriate argument and then looks to see whether the specified field in each record is equal to the argument.

There are some rules that always operate when making the comparison. To understand fully how these work you should consult your computer manual about ASCII character codes.

- a) A text field is regarded as **EQUAL** to the argument **EVEN IF IT IS LONGER**, provided that it matches the argument as far as it goes. Thus an argument of **FRED** will be an equal match to **Fred**, **Freddy** or **FREDA**.
- b) A field is regarded as **UNEQUAL** and **LESS** if it is shorter than the argument, even if there is a match as far as it goes. An argument of **FREDA** will not therefore match with a field of **FRED**.
- c) A text field that is longer, or the same length, than the argument is deemed to be **GREATER** or **LESS** than the argument depending on the ASCII values of the characters in the text. Consult your computer manual if you are unsure what this means but in general numbers come in the order 0-9 followed by the alphabet A-Z. If the search is case specific then uppercase comes before lower case letters. You will find that in most cases common sense will be able to predict what the outcome will be.
- d) If the target field is absent then a match is not made, even if the chosen comparison was **UNEQUAL**. To find such records you must select option **A** for **ABSENT**.

There are also two rules that operate unless you say otherwise

- a) The argument you give is assumed to be a text string, even if it contains just numbers. To signal to Masterfile that the argument should be regarded as numeric the argument first must be prefixed by a **'!**' character and secondly the rest of it must **LOOK** numeric. (It must have no signs, currency symbols, letters, or spaces and only one optional decimal point. All numeric data is therefore regarded as positive).

If there is non-numeric data entered by mistake in a record then no match is made at all, even if the intended comparison is Unequal, it is therefore good practice to use the option to find Non-Numeric data to trap errors beforehand.

A numeric argument could therefore look like this **!22**. It would match with target fields of **'22'**, **'22.00'**, **'022.0'** etc.

Numeric comparisons only work with the options E:Equal, G:Greater, U:Unequal, and L:Less. A numeric comparison will only be made if the target data field also qualifies as numeric.

It is very important to understand the implications of a numeric search. In some cases the same result will be obtained when searching numerically or otherwise. For example we can match a target field of '22' with either 22 or !22. However with the non-numeric argument we will also get a match with '22Ø' or '22 carat' and not with 'Ø22.Ø'.

Another possible error will result with a target field such as '1ØØØØ'. This would be regarded as LESS than a text argument of 22 on an ASCII basis but of course will be regarded as GREATER than a numeric argument of !22.

- b) When comparing text it is assumed that upper and lower case are equivalent unless the argument is prefixed by a '^' character (below the '#' key, the same character as we use to designate a child record).

Once you have specified your argument the comparison choices are therefore

E:Equal - the target field is numerically equal to the argument, or textually equal up to the length of the argument given.

L:LESS - the target field is numerically less than the argument, or textually shorter than the argument but equal as far as it goes, or of any length but ranking lower in terms of ascii values.

G:GREATER - the target field is numerically greater than the argument, or textually the same length or longer than the argument and ranking higher in terms of ascii values.

U:UNEQUAL - the target field is numerically different to the argument, or textually shorter, or, if the same length or longer, it contains different text to the argument up to the length of the argument.

If these are hard to follow then a bit of trial and error will soon demonstrate that the underlying logic is really very easy to grasp in practice.

The final, and in many cases the most useful, option available is

S:Scan - this searches the target field to see whether the argument can be found at any position within the text, technically called a substring scan. Thus a scan argument of Fred will match with data such as 'Nina and Frederick' and 'Manfred Mann'. A moments thought will soon show that the scan option only makes sense with data TREATED as text and not numeric, although it can be used on numbers we need not include the '!' prefix.

There is a special technique we can use in conjunction with Scan that may prove very useful. When we first choose the `Data Compare` option we are prompted to specify the data reference code of the field we want to search. It is possible to then enter the special reference of `'*'` which has the meaning of 'scan all fields in each record'. An attempt is then made to match the argument to ANY of the data fields of the given records.

Remember that this choice is only sensible when you are intending to make a substring scan, if you press `'*'` by mistake, or change your mind, you should back out and re-choose. Attempting to perform a different search such as `P:Present` with a field reference of `'*'` will simply return you to the first Search Menu.

If you find you are frequently using a predictable but complex search dialogue to select certain records then this will be a prime opportunity to exploit the CPC's programmable function keys (see the section on Adjusting Masterfile).

Sorting The File

A file can be sorted at any time so that records are displayed in some sort of logical order. In particular you will probably find that after adding new records, which are always put onto the end of the file, you will want to use Sort again.

Sort mode is entered via option 0 (0 for `'sort in Order'`) in the Main Menu. There are a series of self explanatory menus and prompts that are used to specify the criteria of the search.

The first thing you are asked for is the data reference of the field you want to sort. Only one field can be specified at any one time but by performing repeated sorts, working from low-order to high-order, it is possible to arrange the records exactly the way you want. For example In a club membership list you may want to sort members by their subscription renewal date, and if several share the same day they should be sorted alphabetically. The first step would be to do the alphabetical sort followed by the sort by date. Those with the same date would then retain their alphabetical relationship to each other.

You are given the choice to sort alphabetically or numerically, and in ascending or descending order. In general similar rules apply as in Search Mode when deciding which of two records come first, but there is a differentiation made between upper and lower case letters, with upper case counting lowest i.e. coming first in an ascending sort.

Again an ASCII code ranking is used i.e. numbers first, followed by upper case letters, then lower case letters, but symbols such as `'$'` and `'"'` are 'scattered' in positions that are hard to remember and you may need to look these up in your manual.

If the target data is missing from a record, or is non-numeric in a numeric sort, then a low value is assumed so that in an ascending sort the records with data missing come first, and in a descending sort they come last. Sorting by a field that is only present in child records is therefore an easy way of putting all parent data at the front of a file, which makes data display faster in a relational file.

If two or more records have identical, or missing, target fields then their relative positions are not altered.

Sort key character.

You may recall that we made mention earlier of the backslash character '\ ' as a special signal when sorting data. Consider this example. It is often desired to be able to sort an address index by surname like a telephone list. However the data text will usually contain other things such as title and initials and it is far more convenient to have these displayed first.

D.H. LAWRENCE is preferable to LAWRENCE D.H.

The conflict therefore is that we want to display as on the right, but sort as on the left. We can resolve this by entering the text as follows.

D.H.\LAWRENCE

When displaying or printing the text the '\ ' is replaced by an ordinary space but when sorting the data the entry is deemed to start from 'LAWRENCE'.

Whilst the sort is in progress the message '--- sorting ---' and a progress number (Masterfile 128 only) appears on screen. Once completed you are returned to the Main Menu.

The time taken to sort a file obviously depends on its size but 20 seconds is typical with Masterfile 464. This time increases geometrically with the file size and can be much longer on the 6128 version. However you can abandon the sort at any point by pressing the [ESC]ape key. This is useful if you change your mind, or if you can tell that the sort has progressed as far as you want. For example if you know that you have twenty parent records, and you are sorting to get them to the beginning, once the progress report reaches 20 then you can abandon any further sorting.

On the 464 version a sort requires some work space left in the file equivalent to the size of the largest record. If this is not available you are given the following warning

*** NO MORE ROOM *** PRESS [ENTER]

and the sort is abandoned. On the 6128 version some workspace has been reserved and you can sort the file even when it is completely full, but you are limited to a maximum record size of 4K, really a very large amount which should be more than enough for your needs. Masterfile does not stop you from creating, or loading a record that is larger than 4K but if one is encountered during a sort then the process is aborted at that record.

Section 5 :

General Housekeeping

Chapter Contents

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Adjusting Masterfile to your Tastes

There are certain modifications you can make to adjust Masterfile to your needs or to make the program more pleasant or easier to use. These are the program colours, printer control characters the function key definitions and the choice of sort key character.

The changes you make to the program may be temporary or permanent depending on how you decide to do it.

Colours

To make a temporary change to the program colours choose option '*' from the Main Menu. When the colours menu appears tap the **P** (Paper), **I** (text Ink), or **B** (Border) keys to step through the colour choices.

To make a permanent change to the program colours you must first exit to BASIC using option 'B' of the Main Menu. You will then see a short BASIC program on screen which is used to load and run the Masterfile machine code.

On the 464 version you will find the commands that control program colours situated at line 100. Type `EDIT 100` and make the required changes. To make this a permanent change you must then resave the new BASIC program e.g. by `SAVE "MASTLOAD`.

On the 6128 version the process to make the changes is the same but you will find that the colour commands are situated in line 40. Your new program should be saved with the filename `"MF128"`.

You can of course use entirely different filenames to save your adjusted programs, and you can therefore have as many versions as you want, each with different colours. However these versions will not be accessed by the `RUN "DISC"` command unless you also alter the program `"DISC"` to take account of the new names.

To restart Masterfile you should then type `GOTO 100`.

Printer Control

There are two possible reasons you will have for wanting to adjust the way that Masterfile prints data.

Firstly you may want to select certain special typefaces or special effects from your printer. For example to select a **BOLD** typeface on Epson compatible printers such as the DMP 2000 requires the command

```
PRINT CHR$(27);"E"
```

Consult your printer manual for a full list of possible effects that can be achieved and the codes that these require.

Secondly you may find that certain printer cables in conjunction with certain printers will cause an extra line feed at the end of every line. All of your data printing will therefore be double spaced. This problem can be simply overcome by telling Masterfile not to bother sending line feed commands of its own.

For MASTERFILE 464 : `POKE 899,0`

For MASTERFILE 128 : `POKE 88018,0`

Whichever printer control problem you have, to make the required changes you must first enter BASIC by pressing option B on the Main Menu.

To make the changes on a temporary basis you should type the above, or their equivalent, as DIRECT COMMANDS, i.e. without line numbers. You can then resume Masterfile by typing GOTO 100, and the changes will stay in effect for the remainder of your session, or until you return to BASIC to make further changes.

To make the changes on a permanent basis you must give the commands a line number (e.g. line 35) so that they are executed after the machine code of Masterfile has loaded, but before control is passed to it. As mentioned above in the section on colours you must then resave the new BASIC program using its original, or a new, filename. When you restart Masterfile from this new loader the changes will be in effect.

Function Keys

You may be aware that the CPC computers allow you to program up to thirty-two of the keys in the keyboard to produce a string of characters when pressed. The RUN " message you get when pressing the [CTRL] and [ENTER] keys is an example of such a function key string. Although you can change this, the 'expansion tokens' as is the technical term, are initially associated with the function/numeric keypad.

If you are unfamiliar with how to create such strings please consult your computer manual which should be able to help.

When using Masterfile you may find that you are often following the same path through several of the menus in order to achieve a certain objective. If this is the case then you could profitably consider programming some of the function keys to do all of the work for you.

Say that you often search records to select those with a target field of T:Telephone that is present, followed by a choice of format code 1 and then a direct return to Display Mode. The sequence of keypresses you would have to make from the Main Menu is R S S D T P X C 1 D.

To make this automatic all you need to do is define a function key to produce the string "RSSDTPXC1D". For example to assign this to the [f0] key on the numeric pad add this to the header.

```
KEY 0, "RSSDTPXC1D"
```

Every time you press that function key the string will be picked up by Masterfile as if it had been typed in at the keyboard, key by key, thereby taking you through the entire sequence. It may be sensible to preface the string by a series of X:exit commands that ensure that you are returned to the Main Menu before it goes into operation or some unintended effects may ensue.

For a temporary function key effect enter BASIC from the Main Menu and type in the definition as a direct command.

For a permanent effect enter BASIC and edit the appropriate line of the BASIC program that appears, as described in the section on printer controls. This short program can then be resaved under its old or a new name, again as described above.

There are two Masterfile functions, printing of data and sorting of data, that read the keyboard at frequent intervals to see if you are trying to back out of the choice you have made. Because of this, these two functions 'swallow' the characters offered by the expansion string meaning that they have to be programmed last in any given function key routine that uses them. Any further key values in the sequence will simply be ineffective.

Adjusting the sort key character

It is a common problem that the standard ASCII character set does not contain all of the letters or symbols used in many international languages. In other countries it is common practice for printers to be set to substitute their own international characters for the less common ascii symbols sent from the computer. The backslash character '\ ' used by Masterfile as the sort key character is one that is often substituted in these cases and there may therefore be a need to include it in the data text as if it were a normal letter. To this end you can substitute any keyboard character as the sort key in this way.

See "ADDENDA" file of the installation disc for details of POKEs to effect such a change.

Printing from Masterfile

By now you should already have encountered the two print options that are available from Masterfile, but this section is intended as a brief recap and reference guide.

- a) A reference list of data fields and data names can, and should, be printed from the Data Names option, N, of Main Menu. Such a reference is invaluable when planning a new format, starting a search etc. The names are printed as seen on screen.
- b) The main print function is to produce a paper copy of the selected data in the same style as it is shown on screen in Display Mode. The print out is accessed from Display Mode by option P, it begins at the current top record of the display and continues until the last selected record, or until stopped by the [ESC]ape key.

Remember that ruled lines are not sent, and any inverse printing is reproduced as normal print on the paper.

The number of record areas per page is governed by the Forms Depth option of the Report Geometry Questionnaire (see the section on Arranging Data if this is unfamiliar). There may therefore be more, or less, records per 'page' than is displayed on the screen giving you the flexibility to print anything from an 'infinite' page to address labels.

Printed output is displaced by the amount specified in the Left Hand Margin question of the Report Geometry.

At the end of every line Masterfile sends the characters for Carriage Return and Line Feed. For most printers this is the correct thing to do but in some cases you may find that a double line feed is produced. To overcome this effect you can disable one of the LF codes by returning to BASIC and following the guidelines given in the section on Adjusting Masterfile.

To send any special control characters to your printer you must first exit to BASIC. See the above section on Adjusting Masterfile for more details. Alternatively for more complex printouts, with mixed fonts etc. you can print data from User Basic or export the data to a word processor.

Printing can be aborted at any time by pressing the [ESC]ape key. You should also use this key if you have requested a printout when the printer is not ready.

Loading and Saving

Loading And Saving Data

Pressing option T on the Main Menu will take you to the Save/Load Menu. The options offered are as follows, and are largely self explanatory.

Load/Save file

Save file.....	S
Load file.....	L
Append file.....	A
Tape.....	T
Disc/drive.....	D
CAI.....	C
Exit.....	X

File: GARDEN Records:0000 Selected:0000 Parents:0000 RAM used:01K from 64K

The correct options should be selected prior to starting the save or load. You should also enter this menu to choose tape/disc prior to going to the 'Data Export' option (available from the Main Menu of the 6128 version only).

The default selection of tape/disc depends on whichever method was used to load Masterfile itself, which would be almost invariably disc.

If tape is selected for data saving or data export then you are prompted for the speed at save time.

Option L is a default option that means that every file you load will completely replace one that is already held in memory.

Option A is a data merge facility and will be dealt with in more detail below.

Appending Data

* THIS SECTION ONLY APPLIES TO MASTERFILE 128

If you have upgraded to a CPC 6128, having used Masterfile previously in its CPC 464/664 version, you may well have some separate files that you would prefer to be able to have in one unit, thereby exploiting the extra memory.

Alternatively you may be in a situation where data that you anticipated would cover two files has been handled so compactly by Masterfile that you realise that it would have all fitted into one.

Or you may wish to copy some of the data from one file to another that has been already started.

In all these situations you should use the data merge option to add two files together. The process is not strictly a merge in that the two files are not automatically sorted together. The second file is simply appended to the end of the file already in memory and any sorting or searching that is desired will have to be specified by you afterwards.

Data names and formats on the incoming file are ignored, although the fields of course keep their data reference code. Records in the incoming file retain the 'selected' status that was in operation when the file was last saved.

Appended records are limited in length to 2K. If a longer record is met then the append operation is abandoned.

It is possible that there may be common records in both merged files, this is particularly likely with parent records in a relational file. Think carefully if any of these duplicates are likely to exist and make sure to remove them.

Merging should preferably only be used with files of very similar contents. If merging two files of different sorts a duplicate reference code in both may mean that data of the second file is assigned to an existing field that is really completely unsuitable e.g. T:Telephone Numbers may be appended with T:Taxable Income. It is best to anticipate these in advance and make the appropriate changes to one of the files prior to the merge.

Masterfile does not provide a direct means for changing a designated data reference code that has data associated with it, but there are several ways you could do this from User Basic.

Any number of files can be chained together in the above way, within the limitations of the overall file size of 64K. If you exceed this limit then the incoming file will be truncated after the last complete record that will fit and a warning message will be given.

Saving The Program

Details on making backup copies of the program have been given in Section 1 of this manual.

You may want to make some different customised versions of the program e.g. one that prints in draft type and one that produces a top copy in Near Letter Quality. Insert the appropriate changes into the Basic loader program before making the save. These versions can be saved under their own specific filenames. See the section on Adjusting Masterfile for more details.

Sending Data to Other Programs

It may be required to have Masterfile data passed to other programs e.g. names and addresses to a word processor or other databases.

Unfortunately the chances of a different program being able to read and understand a normal Masterfile file are almost non-existent.

For a start almost every program you will come across has its own preferred format for storing and reading data, even though on the screen it is all presented in the same way.

Secondly in every one of your data files there is 'hidden' information that tells Masterfile things like the length of each record, format control codes etc. Even if your word processor could read the parts that represent data text it wouldn't be able to make any sense of the surrounding information, especially since some of it would probably not be made up of printable characters.

The answer to all these problems are provided by the Data Export function of Masterfile. This is selected by option E of the Main Menu.

This option strips almost all of these control codes and creates an output file of ASCII-only characters, in a variety of possible formats. Such a file should be readable by most AMSDOS or CP/M data handling programs, or could even be sent to another computer via an RS232 interface.

Remember first to specify tape/disc and which drive from the Load/Save option T.

Remember also that only SELECTED records are sent, which means that you should first make sure that the file has been Searched and otherwise manipulated in the way you want. If you want to supply addresses for a 'mail merge' application for example you will almost certainly only want to send a selection of all the records on your file. To send all records, start with R (reset) I (invert) at the main menu.

Data Export Option

Once you have everything arranged the way you want just press option E. Exported data is sent as an ASCII file but you are also presented with a series of five simple Y/N questions that find out from you the way the data is to be packaged to make it comprehensible to the utility you have in mind. These are as follows.

Data identifiers to be sent ? Y/N

You have the choice here of sending nothing but the actual data text, or prefixing each field with with a two-character identifier. The identifier consists of the ampersand (&) character followed by the Data Reference code. For example you may have a field "names" filed with the Data Reference 'N'. You can export the data as either 'J Smith' or as '&NJ Smith'.

The data identifiers can be used by you, or by the receiving program, to recognise where each new field begins. For example they would be used directly by Tasword 6128 to identify the names used in a mail-merge letter.

The next question is

LF as well as CR ? Y/N

Every data field is normally only terminated by a Carriage Return byte (decimal 13). This is the signal to most programs to actually perform a Carriage Return (move the cursor back to the left of the screen) AND a Line Feed (move the cursor down to the next line). Some utilities however may expect you to explicitly terminate each field with both a CR and a LF (decimal 10) or you will find that everything is confused on the screen or the receiving program may crash.

We are then asked

Edit line breaks etc ? Y/N

This question refers to the two 'special characters' that we can embed in our data text, the line break character '_' and the sort key character '\ ' (see 'Entering Data' for a recap on these). If you answer N to the above question you will find that both of these characters are sent visibly with the data text. If you have answered Y they are 'edited' so that '\ ' is replaced by a space and, probably more importantly, a line break is forced at the appropriate point, i.e. where '_' is encountered, by inserting a CR (and LF if chosen). This is especially useful when sending addresses etc. which would otherwise appear on one long line.

You can also make use of the line break codes at this point for sending data to utilities that operate in forty column mode, thereby ensuring that the text is arranged the way you want.

Next there is

Soft EOF to end ? Y/N

If you are unfamiliar with the term EOF you should look it up in your computer manual for more details. EOF stands for End-Of-File, which is self explanatory. What you may not have realised is that some programs calculate when they are at the end of the file by keeping track of where they are in relation to the file length. Others do not bother to do this but have a special character code, &1A in hex, 26 decimal, which signal that the end of file has been reached. This latter case is called a SOFTware End-Of-File. Your own BASIC programs can be flexible about which system they use but some commercial programs will be fussy. Answer/Tasword for example needs to have the &1A code suppressed (answer N to the question) whilst CP/M programs usually need it active (answer Y to the question).

The final option is

Comma delimited data ? Y/N

This refers to a certain type of data formatting that is particularly common in CP/M programs. Each data field is sent enclosed in double quotes e.g "Fred Smith" and each such field is separated from the next by a comma. Only at the end of each record is a CR (and LF if requested) code sent. Blank fields are sent as two double quotes e.g. "". If you have requested line breaks to be edited then the result is that each line of data is sent in quotes, followed by a pair of empty quotes, followed by the next data line etc. Because double quotes act as data delimiters any such characters that you have embedded in the text are automatically edited to a single quote character.

As an example of the appropriate choices, exporting data to TASWORD for mail-merge purposes should elicit the responses Y Y Y N N. For direct loading into TASWORD as a text file the desired responses will probably be N Y Y N N.

Once all five choices have been made, you are asked which data fields are to be sent. Remember that only selected records are used for export, this option allows you to narrow down the amount of data sent even further so that only certain fields are exported.

You are prompted as follows

Give reference of data to extract, or [ENTER] if no more.

All you have to do is type the Data Reference codes of each selected field in turn. When you have completed your list you can signal this by pressing [**RETURN**]/[**ENTER**].

Any number of fields can be sent, as long as the data references are present in the data names list. This is an error catching feature. Requested fields that are NOT present in the list will not be sent even if they have had some data entered under the specified reference code e.g. direct from display mode.

Relational files are supported in a predictable way, i.e. when exporting child records if any specified field is absent from the child Masterfile will look it up in the corresponding parent. Only if the specified field is missing from both records will the default text be inserted as explained below.

You should consider that since the parent record data is effectively duplicated into each child record the advantages of saved space are lost and the exported file may be considerably larger than the original Masterfile file was. For many target programs this may not matter since the file can be accessed sequentially but for some, such as Tasword, you should be aware of the limitations to file size that they impose.

After giving each data reference a second prompt will appear

Default text if no data:

You are then able to insert any line of text that you would want to appear if that particular field was missing from one of the records, and its parent if applicable, e.g. "Phone number not known". If you want the absent field to remain blank then just press [**RETURN**]/[**ENTER**] at this point. Whichever you choose the data reference prompt will then reappear.

Once you have finished specifying all of the references you wish to export the final prompt will appear

Give file name for output:

Once you have given the file name, using the legal number of characters etc., the file is written and the Main Menu resumed. Pressing [**ESC**]ape or just [**RETURN**]/[**ENTER**] at this prompt will back out of the export operation and return you to main menu with nothing being done.

Reading The Exported File

Here is a simple BASIC program that would let you read and inspect the file data that has been exported.

```
10 OPENIN "filename"  
20 WHILE NOT EOF  
30 LINE INPUT #9,a$  
40 PRINT a$  
50 WEND: CLOSEIN
```

You can pause the text at any time by one press of the [ESC]ape key, the text can be restarted by pressing any other key.

Problem Programs

Even with the flexibility of export options available it is inevitable that some programs will have idiosyncrasies that are not anticipated by this utility. Data export is still possible in many of these cases but it will require you to get your hands dirty by further manipulating the data or even Masterfile itself.

For example Tasword 6128/Tasword 464-D data merge does not allow the use of non-alphabetic data identifiers such as &\$ or &% but these can be used in Masterfile. Conversely Tasword can distinguish between lower case and upper case alphabetic characters in the identifier, which Masterfile does not do.

Preferably therefore you should stick to using alphabetic data references when creating a file that you may wish to export to Tasword. Occasionally a file will have so many individual fields that this is not possible. The best way to get round this problem would be to load the exported file into Tasword and edit it there, changing the non alphabetic characters to lower case letters before attempting to use it in a data merge application.

Even if you have few fields in your file you are always obliged to use the non alphabetic characters '>' and '^' in a relational file. If you want to send these to Tasword for data-merge there is a means by which you can alter these 'in flight' to any suitable letter without later having to edit them.

Prior to selecting Data Export choose Main Menu option B to enter BASIC and type

```
POKE &8019,ASC("a")    to send a lower case 'a', for example, instead  
                        of '>'
```

```
POKE &801A,ASC("b")    to send a lower case 'b' instead of '^'
```

The above is just one example of the sort of minor problems that may occur. In other cases where you have problems with data export remember that it is perfectly possible to write your own customised Data Export routines using the USER BASIC option explained in the next section. In this way, for example, you could preface each record by certain header information, such as the length of the text, that may be required by the target program, or to fill the text with spaces so that they all fit into a fixed field length.

To tackle such a task you will need to have a knowledge of BASIC and also the necessary information about the way your target program handles its data. To obtain such details you may need to contact the company concerned, the authors of Masterfile will not be able to supply this information for you.

Section 6: Advanced Uses

Chapter Contents

User BASIC

- Entry points to Masterfile Code
- The Basic Loader
- Masterfile File Structure
- User Basic Commands in Detail
- Error Handling
- File Space
- Examples of User Basic

User BASIC

*BECAUSE OF MEMORY LIMITATIONS THIS FEATURE IS ONLY AVAILABLE ON THE 6128 VERSION OF MASTERFILE.

There are certain things that Masterfile is very good at, it can file, search and display your data with great ease, but it is not designed to perform any significant automatic processing or transforming of the data, except for producing simple totals.

Similarly, although you are provided with facilities for easy updating of your data, if you have large amounts of regular, and reasonably predictable, amendments to make it would be preferable if you could utilise the power of the computer to do the hard work for you.

However for those users who are prepared to write some BASIC, it is possible to manipulate file data in a variety of new and ambitious ways. This is by virtue of a small but powerful subset of Masterfile commands that can be accessed by CALL's from BASIC and utilised in a program of your own devising.

Creating a User Basic program of this type can present untold advantages, and greatly increase the power of your Masterfile package, but by definition it requires a degree of comprehension on your part of how to program in the BASIC language, and an understanding of how Masterfile organises the storage of its records. As long as you take things slowly, referring to your computer manual and this booklet, this should be within the grasp of most people. The most important thing is to make a back up copy of both Masterfile and your data before you start to experiment, in that way you ensure that no harm can be done.

Giving access to the workings of Masterfile in this way does put some onus of responsibility on the user to ensure that records are not erased by mistake, and that important existing lines of BASIC, especially the ones that set up the entry points and which load and call the Masterfile machine code are not lost. The authors of Masterfile will be pleased to help with any problems that arise from the database itself, but we cannot undertake to inspect or debug your own User Basic programs.

Entry Points to Masterfile Code

The first two lines of Masterfile 128's Basic loader program define several entry points to the machine code which may be CALL'ed using relatively easy to remember variable names, to produce the desired effect. If the very concept of machine code fills you with worry just look on each of these CALLs as extra Basic commands, each with their own syntax. You will find that its all quite easy, you require no understanding or knowledge of machine code to use them.

Your User Basic programs that employ these calls should be written into and around the existing loader program which can then be re-saved under any suitable name for regular use. Approximately 11K is available for User Basic.

User Basic can be used to examine/alter/replace/insert data within selected records. It can erase records, insert new records - even create a whole new file from another data source. It can be used to create summary reports adding extensive surrounding text and using special printer options such as underlining on selected text areas, it can display records in more flexible or informal formats than are possible through Masterfile (e.g. in 40 column mode and with graphic surrounds). It can be used to perform complex computations on the data.

It does NOT let you select or unselect records, save the file, or give access directly to Masterfile's sort and search functions. The latter features can be implemented from Basic, but you will have to construct the routines yourself. Normally you would return to Masterfile to perform them.

The full list of entry points which may be called is as follows:

START (&8000) Behaves just like the initial load of Masterfile, forgetting any data file already resident in RAM

RESUM (&8003) Resumes main menu with any existing file intact

It is vital that you appreciate the difference between these two and use the correct one, an erroneous **CALL START** can wipe an entire file instantly!

GETR (&8006) Accesses the nth selected record, which becomes 'current'. The current record is the one that is worked upon by the the following commands.

GETD (&8009) Retrieves a specific data field from the current record.

PUTD (&800C) Stores a new, or replaces a modified, data field in the current record

ERAD (&800F) Erases a specific data field from the current record

ERAR (&8012) Erases the current record in its entirety

INSR (&8015) Inserts a new empty record which becomes current

We suggest that you use the given names for clarity, but note, for example, that "CALL GETR" is equivalent to "CALL &8006". You can of course replace the variable names used with ones that you find are even easier to remember e.g 'CALL GETNEXTRECORD' but a note should be made of the above suggested names to use when communicating with other users or the authors.

The Basic Loader

Whilst Masterfile is fully machine coded it requires the presence of a short Basic Loader that does a few essential jobs. It loads the code, it defines colours and it also defines the entry points that can be used in User Basic.

When MASTERFILE is loaded, the loader's line 40 sets the default colours and calls START which produces the main menu. Pressing [B] at the main menu therefore completes the CALL and resumes Basic just after the point it was left i.e. at line 50.

Our existing loader simply displays the message "Basic Environment" and stops with a LIST. If you then enter GOTO 100 this resumes the program at the Main Menu with the file intact, since RESUM is used. If on the other hand you GOTO 40 - or even RUN - the main menu is produced but any file that was present is forgotten. It is VERY IMPORTANT that you remember this!

Normally therefore you would be programming approximately within lines 110-9900. You can exceed these limitations if you respect and take account of the existing components of the Masterfile loader. For example either maintain the integrity of the subroutine at 9900 which prints the copyright message, or if you use those lines for yourself you must remove the corresponding GOSUB command from line 10.

You do not have to retain the LIST command from the existing loader. You can write your Basic as a subroutine called from line 60, which is the next executed line after exiting from Masterfile e.g.

```
60 GOSUB 200
```

This would automatically execute your program starting at line 200, when main menu [B] is used. When your subroutine reaches its end, as signalled by the RETURN command, line 100 would be executed which would return you to Masterfile with the modified records intact in memory. From there you could Sort, Search or Save the data as with a normal file.

Of course, a return to Masterfile can be achieved by ESCaping from the Basic and entering GOTO 100 as a direct command.

Whilst entering and debugging your code you would be advised to insert a safety net at line 1, which can be either a GOTO 100 command or a STOP command. This ensures that if your Basic stops with an error statement and you forgetfully type RUN to restart it you do not reach line 40 with its CALL START command, thereby erasing the file. Do NOT use a GOSUB 200 command in line 1 since, when the routine is over you will be returned to line 1, and hence to line 40.

Masterfile File Structure

Before we can make use of the entry point commands, it is necessary to learn something about the way Masterfile structures its files and records. As you know, a file consists of many things such as data names, report formats and data records. Only the data records are accessible to USER BASIC, and of these, only SELECTED records can be processed.

Each record in the file has a one-byte header whose value for selected records is &C0. Following the header are items which correspond to each individual field within the record. These fields can be stored in any order and each is made up of the following three parts:

- 1st byte: Data Reference Code, in the ASCII range !(&21) to ↑(&5E)
- 2nd byte: The character length, 1-240, of the following data expressed in binary
- 3rd etc bytes: The Data text itself, 1-240 ASCII characters

Each of the data items or fields are passed to and from User Basic in undimensioned strings. If you had accessed a data item in the string `D$` by using the command `CALL GETD,@D$` then you would be able to specify each of the three parts as follows:

```
Data reference is LEFT$(D$,1)
Data length is ASC(MID$(D$,2,1))
Data text is MID$(D$,3,ASC(MID$(D$,2,1)))
```

Note that the data length is not necessarily a printable character.

Retrieved data text can also be expressed more simply as `MID$(D$,3)` provided that `D$` has been filled with spaces before using `GETD` e.g. by `D$="R"+SPACE$(240)`.

Because all data is passed into character strings, extensive use of the `VAL` and `STR$` commands need to be used to allow a numeric value to be extracted for arithmetic purposes e.g. as in the expression `VAL(MID$(D$,3))`. `VAL` converts a text string to a number or the closest number it can manage. `STR$` converts a number into its text string equivalent. For example `STR$(12)` is "12" but if `x=10` then `STR$(x)` is "10" rather than "x".

Like Masterfile itself, the `VAL` command puts certain restrictions on the type of string that can be converted to a number, but these restrictions work rather differently. For example any string that begins with a valid numeric part will be taken as a number as far as it goes e.g. `VAL("23 Rosewood Avenue")` is regarded as 23. Secondly any string that is completely non-numeric e.g. `VAL("stock control")` will be given the value of 0. There is therefore much more scope available for making disastrous arithmetical errors when processing data from Basic than from Masterfile directly. On the positive side we do not have to worry about any trailing spaces that are fitted to the numbers when they are passed into the specified string.

Consult your computer manual for a complete specification of how the functions `STR$` and `VAL` work.

The User Basic Commands In Detail

The following are a list of definitions of the effects of each entry point call. Each of these calls act as a command that perform the desired action. Some require a special 'syntax' which specifies the name of a string variable. The string is used to pass data text between the file and User Basic, or in one case to receive an indication of the success of the required action. Remember that both the entry point names and the string names can be altered from those given if desired.

GETR: Access a Record

SYNTAX: CALL GETR,n,@ind\$

This is the command that is issued to make one specific record from those available into the 'current record'. The current record is in effect the same thing as the 'top record' we are familiar with from Display Mode i.e. it is the record that can be accessed for data insertion, deletion or amendment.

In the command syntax 'n' is the number of the record to be accessed and may be a literal number or the name of a numeric variable containing the record number. Record number x simply means "the xth selected record". For most purposes one would simply process records sequentially by starting n at 1 and adding 1 each time through.

Ind\$ is an indicator which is set by GETR to "E" if the record is not found i.e. if n is greater than the "Selected=xxxxx" value. "E" is thus a marker which can be considered to stand for end-of-file.

GETR counts from the beginning of the selected records every time it is used, so erased or inserted records are taken account of.

GETD: Get Data from Current Record

SYNTAX: CALL GETD,@d\$

This is the command used whenever we wish to inspect, or modify, the information held in a specific data field within the current record. Any specified string variable can be used to receive the data item, in the above example the one used is d\$. This string must be long enough to receive the entire data or truncation of some of it will occur.

Before making the CALL the first character of d\$ should be specified. This denotes the target data reference code. It is best to fill the rest of d\$ with spaces before using GETD. An example, to access data field 'N:Names' would be perhaps d\$="N"+SPACE\$(30).

The complete data item that is passed to d\$ also includes information about the data length and the data reference as explained above.

If the target data is absent then the data length is set to zero; a test for this can be used to prompt a filler message.

We now have enough material for an example, which simply displays all names (data ref "N") from selected records:

200	n=1:ind\$=" "	Defines init record no. and ind\$
210	WHILE 1	do always...
220	CALL GETR,n,@ind\$:n=n+1	access nth rec, advance n
230	IF ind\$="E" THEN STOP	if no more, stop loop
240	d\$="N"+SPACES(30)	define d\$ length and target data
240	CALL GETD,@d\$	retrieve "N" data into d\$
250	PRINT MID\$(d\$,3)	display data
260	WEND	repeat...

PUTD: Insert/Replace Data in the Current Record

SYNTAX: CALL PUTD,@d\$

This command is used when we have modified a data field, or have created an entirely new one. If an item with the same data reference is already present, then it is replaced with the supplied item (you can use GETD to test for such an existing record as an error trapping feature). Otherwise, the new item is inserted.

The string d\$ contains the data item to be inserted into the record. It must start with a valid data reference. The data length byte need not be valid, since PUTD ignores it and replaces it with LEN(d\$)-2. In other words, the length of d\$ determines the data length byte. Any leading spaces in the data are dropped, and any invalid text is edited to "*" - a safety precaution to maintain the integrity of the file.

If d\$ has been set to a length that is larger than necessary then file space may be wasted by the presence of trailing spaces. These can be edited out using the Masterfile line editor if space is at a premium.

ERAD: Erase Data from the Current Record

SYNTAX: CALL ERAD,@d\$

This is the command used when we wish to entirely erase a data field. The string d\$ must be specified beforehand so that the first character contains the data reference of the item to be erased from the current record. For example, to erase item "K":

```
d$="K":CALL ERAD,@d$
```

ERAR: Erase the Current Record

SYNTAX: CALL ERAR (no parameters)

This is the corresponding command that erases an entire record from the file. Notice that after erasing the nth record, the next selected record in the sequence is still the nth, since GETR counts from the beginning of the file every time. After an ERAR call, there is no current record until another GETR or INSR is issued. This acts as a useful safety device to ensure that you can not include ERAR in a long loop unless you really mean to (well probably not anyway).

Even so, ERAR is a potentially disastrous command and if you are prone to typing errors it may be sensible to redefine the call name so that it is much more different from ERAD.

INSR: Insert a new Empty Record

SYNTAX: CALL INSR (no parameters)

A new, empty record is inserted after the current record, or onto the end of the file if there is no current record. The new record becomes the current record. INSR is of particular use in generating a new file from external data, and would be followed by PUTD to move the data into the new records.

If USER BASIC is used to alter a file, then presumably you will want to save the file; this is achieved simply by returning control to MASTERFILE proper, via GOTO 100 and then invoking the file save function.

Error Handling

Generally, errors are handled by ignoring a bad request. For example, if you try to GETD/PUTD/ERAD/ERAR when there is no current record, then the system just BEEPs and ignores. For this reason, it is best not to run with the sound off. A serious error such as inserting data when the file is full, behaves the same as MASTERFILE proper, with a warning message, a BEEP, and the insertion is suppressed. To break out of an overflow loop, press **[ESC] [ENTER] [ESC]**.

File Space

Before starting a User Basic program that creates an extensive amount of new data please make sure that there is room within the file for it to fit.

Masterfile is very flexible and efficient in the way it stores data text. Fields can be of any length, and there is no wasted space. However when we are using User Basic to amend records it is often convenient to use an automatic loop such as `WHILE: WEND` to get data from, and return data to, the file. Because we have to compensate for the largest record in the file the string variables used to hold the data in these loops will, by definition, be larger than necessary in some cases and you may find that some of the data is padded with trailing spaces.

Because of this it may be necessary for you to construct a routine that clips off all trailing spaces from each string in turn. This should ensure that the file is no larger when it goes back than it was when it came out.

For example you could use a function such as `INSR(D$, " ")` to find the first occurrence of a line of trailing spaces in the string `D$`. The correctly shortened form of `D$` will therefore be

```
LEFT$(D$, INSTR(D$, " "))
```

Examples of user basic

Example 1:

In this example, selected records from a stock file are processed so as to recalculate and store the stock value in each record. It multiplies stock level by unit cost, and stores the result into stock value. Stock level is data ref "L", unit cost is data ref "C" and the stock value is data ref "V".

```
200 N=1: WHILE 1
210 CALL GETR,N,@ind$:N=N+1:IF ind$="E" THEN 100
220 d$="L"+SPACES(20):CALL GETD,@d$:SLEV=VAL(MID$(d$,3))
230 d$="C"+SPACES(20):CALL GETD,@d$:UCOST=VAL(MID$(d$,3))
240 d$="V."+STR$(SLEV*UCOST):CALL PUTD,@d$
250 WEND
```

Explanation:

Line 200 initialises the record number and starts the loop.

Line 210 accesses the Nth selected record, returns via line 100 to the main menu when all records have been processed.

Line 220 retrieves Stock Level from "L" data, converts to numeric into variable SLEV.
Line 230 retrieves Unit Cost from "C" data, converts to numeric into variable UCOST.
Line 240 builds a new Stock Value item "V", the string of the computation of SLEV*UCOST.
Line 250 repeats from 210

The use of VAL and STR\$ functions is typical where arithmetic manipulation is required, since all MASTERFILE data is filed in ASCII (string) format.

To execute the program, the stock records must be selected, then main menu option [B] is used. Then GOTO 200. On completion, the main menu is resumed and the updated file can be displayed and saved. To make the operation automatic, one can replace line 60 of the existing loader with:

```
60 GOTO 200
```

Alternatively, one could have 60 GOSUB 200 and line 210 could end with "THEN RETURN" instead of "THEN 100", as in our next example.

Example 2:

Suppose we wish to store a serial number into each selected record, starting at number 1.

```
200 N=1:WHILE 1
210 CALL GETR,N,@ind$:IF ind$="E" THEN RETURN
220 d$="S."+STR$(N):CALL PUTD,@d$:N=N+1
230 WEND
```

This stores "1", "2", "3" etc. under data reference "S" in each selected record.

Section 7: Practice Makes Perfect

Chapter Contents

Quick Reference Guide

- Creating a New File
- Creating a New Format
- Exporting a File
- Printing a File

Examples of Use

1. A Simple Name and Telephone Number File
2. Name and Address Labels

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Quick Reference Guide to some Masterfile Functions

This manual will take you through every step involved in creating and using a new database but for reference here is a quick summary of all the steps involved in performing some common functions.

Creating a new file

1. Define the Data Reference Codes and Data Names via option N.
2. Add a few records to the file following the prompts given through option A.
3. Enter Format mode via option F and create a new format so you can see the data. The most recently created format will automatically be allocated to your data unless you choose otherwise via option C.

-
4. Enter Display Mode to see the effect of your format on the data display. Both the data itself and the format can be amended from the display mode.
 5. Enter the rest of your file records.
 6. The data can now be sorted or searched as desired to select which records you wish to display.

Creating a new format

1. Select format option F from main menu
2. Choose whether you want to start a brand new format, or base it on a copy of an existing one.
3. Assign a format reference code
4. Study the report geometry (overall layout). If you are not going to print the data you can leave the 'forms' questions alone. Choose the title and heading and record area sizes.
5. Choose the 'insert item' option to put some text into the display. Is it going into the heading area or the record area? Is it going to be Heading text or record text?
6. If a header, write the text and specify where to put it.
7. If record text, specify the data field to be displayed and the position it should go on screen.
8. Continue inserting items until finished.
9. Check the format at any time by switching to display mode (press D) and back again (also press D).
10. Insert ruled lines if required.
11. Use 'next item' option to step through the defined items making alterations or deletions as required.
12. Switch to Display mode to check the format over several records.

Exporting a file.

1. Choose the Save/Load option from the Main Menu.
2. Select tape or disc.
3. Return to Main Menu.
4. Use Search Mode to ensure that the correct records are selected.
5. Choose Data Names option to ensure that ALL the fields you want to export are present in the list.
6. Select the **D a t a E x p o r t** option from Main Menu.
7. Answer the questions to send data in the correct format.

Printing a file

1. If you haven't done so before and you feel it is necessary, enter Basic to make changes to the line feed code, and to select special printer options such as Bold print.
2. Create a new format, or review an existing format to ensure that the correct options are entered for the forms depth, margins and paper type.
3. Also check that the required data fields are displayed at the same time.
4. Enter search mode to ensure that the correct choice of records are selected.
5. Enter Display mode. Press **P** to print from the first visible record to the end of file. Press **[ESC]** at any time to abandon the print.

Examples of Use

Example 1. A simple name and telephone number list

As with all new files, we will start this example with an empty system i.e. with "Bytes used: 000000" or with "Memory used: 0K" either by loading MASTERFILE 464, or by emptying the previous file.

The first task is to establish the data names and references. We will use references "N" for names, and "T" for telephone numbers. On the left we show what you key and on the right are comments (not keyed). Study the screen carefully before and after each response and discover what is happening. Starting at main menu...

[N]	Enters Data Names screen
[I]	Insert new ref/name
[ENTER]	Not at any particular place
[N]	Our chosen data reference
Name[ENTER]	Enter Data Name of "name"
[I]	Insert new ref/name
[ENTER]	Not at any particular place
[T]	Our other chosen data reference
Telephone no[ENTER]	Data name of "Telephone no"
[X]	Exit to Main Menu

Already the memory or bytes used status has clocked up - our data names become part of the file and take up some space. But "Records: 0000" still shows since no records have yet been added.

With the data names established we can now add a few records, as follows...

[A] Add a record to the file

At once our data names become prompts, reminding us what to enter...

Peter[ENTER]	name
01-555 6666[ENTER]	telephone
[X]	no more extra data to go in or changes to make
[A]	Yes, let's have another record...
David[ENTER]	name
0523 57781[ENTER]	telephone
[X]	no more this record
[A]	Yes, let's have another...
Anita[ENTER]	name
01-245 6789[ENTER]	telephone
[X]	no more this record
[ENTER]	no more records for now, back to main menu

At this point notice that we now have "Records:0003" "Selected:0003", reflecting what we have just done. Now we must design a Format in order to be able to see our new file. Display mode cannot be used until a format is present. (Try [D] now anyway just to see what happens...then [ENTER].)

To make a format to show names and telephone numbers...

[F] to FORMAT mode
[N] insert a NEW format
[1] which will be format "1"

At once a Report Geometry questionnaire is offered - and here most of the defaults we will leave and just alter the title...

[A] Alter the geometry
[ENTER] six times Position diamond at title line
Telephone List[ENTER] The new title

Now to insert a record data item to specify "name" display...

[I] Insert a format item
[D] for Record Data

We get a new questionnaire

N[ENTER] Data ref. The data name then appears in response so you can check it is the correct one
[ESC] no more changes to this questionnaire

Now for a second record data item to display the "telephone no"

[I] Insert a format item
[D] for Record Data
T[ENTER] data ref
[ENTER] skip HA/RA, leaving RA default
30[ENTER] this time put it in column 30
[ESC] no more changes

Now we can test our format. We can go via main menu but it is more useful to enter DISPLAY mode directly in order to take advantage of the direct-return to FORMAT option. So...

[D] Go to Display

Now we can see our three records double-spaced and separated from the title by the default (and empty) heading area (of 1 line). The format reference code ("1") is shown at top left. Let us go back to **FORMAT** mode and improve our display.

[D]	Direct return to FORMAT
[I]	Insert format item
[L]	get Ruled Line Questionnaire
[ENTER] six times	bypass defaults
11[ENTER]	we want eleven lines
2[ENTER]	at two-line intervals
[D]	Display again

Now we can see ruled lines interleaving our records.

We will conclude our example with a sort into name order...

[X]	Go to main menu
[O] letter "Oh"	Order (i.e. sort)
[N]	by name data
[A]	ascending
[C]	character
[D]	display the result

The names will now be in alphabetical order.

Note: We left the default width of 40 columns for each field. In fact in our example this gave us overlapping fields. As an exercise, alter the format to have the names right-justified and observe the effect. As a further exercise, tidy up the format to have non-overlapped fields. Also, make the heading area 3 lines deep instead of 1 line and insert column headings "Name" and "Telephone" in line with the displayed data. Remove the ruled lines and experiment with the record area depth which is currently two lines. Try other values. Insert more records, re-sort and so on. Then un-select via **[R]** at main menu and try to find records using the **SEARCH** system, **[S]** etc.

Example 2. Name and address labels

We can extend the file in Example 1 by having addresses stored in each record. We will allocate "A" for addresses and insert its data name as follows, starting again from Main Menu.

[N]	Go to Data Names screen
[I]	insert a new data reference and data name
[N]	insert the new one after "N:Name"
Address[ENTER]	Data Name of "Address"
[X]	exit to main menu

We cannot use the **A:Add Records** option to insert the addresses into the records we have already defined, although any time we enter an entirely **NEW** record from this option we will be prompted for the address as well as name and telephone number.

To add addresses to the existing records we must enter **DISPLAY** mode. All forms of update to existing records must be done this way. In **DISPLAY** mode, with our telephone list selected and viewed, choose these options. If you first want to inspect the 'invisible' menu of choices available first press **[H]**.

[A]	to alter top record
[I]	to insert a new field
[A]	Data ref for our new field
14 High St_Bath_Avon [ENTER]	address data
[X]	no more changes this record
[1]	advance to next record
[A]	to alter it
[I] [A]	etc. until all records are updated.

Now try adding a few new records from main menu, **[A]** etc. Note that "address" is prompted after "name" but before "telephone" because of the position where we inserted the new Data Name.

Now, although we have a file of addresses, the addresses are not yet displayed so the next task is to alter our old format or create a new one.

Let us create a format with the aim to display and print address labels. Let us assume that we have peel-off labels on tractor stationary at 2-inch intervals and the printer advances 6 lines per inch. Thus the line interval between successive labels is $2 \times 6 = 12$ lines. We want each label to show name followed by address.

Enter **FORMAT** mode and create a new format, call it ref "2", via **[F][N][2]** etc. For the rest of this example we will assume you can find your way following our narrative rather than key-by-key...

The all-important Geometry item, which controls the printer display, must be altered as follows...

Heading Area depth:	set to 0
Record area depth:	set to 12
Forms depth:	set to 99
Title:	Address Labels

The Heading Area depth of 0 is advisable for this kind of print job. The Record Area depth we set to keep in step with our forms labels. The forms depth of 99 is important, signalling that the forms are an infinite page with no repeat of Heading Area and no page gaps. Some printers will need to be set so as not to insert their own form feeds.

Next we insert a Record Data item, printing N (name) in column 1, line 5, 25 columns wide, 1 line deep in the RA (Record Area).

Then we insert a Record Data item, printing A (address) in column 1, line 6, 25 columns wide, 4 lines deep in the RA.

Enter **DISPLAY** mode to test this and you should see one name-and-address per screen, with the addresses correctly divided into lines by virtue of the line-break characters. For example...

```
14 High St_Bath_Avon
```

should appear as

```
14 High St
Bath
Avon
```

Now, switch on and ready the printer, then press **[P]** - and the labels are then printed, at 12-line intervals. On most printers default line feed rate is 6 lines per inch so that 2" label spacing is matched by our 12-line RA depth. Once the first label is aligned the rest stay in synchronisation.

Note that we specified lines 5 and 6-9 for name and address respectively. This could just have easily been line 1 and 2-5 for printing purposes but it looks better on the screen lower down.

You can switch from format 2 back to format 1 (name and number) just with two keys...**[R][1]**.

Whatever format is currently in force for the display, pressing **[A]** for alter-top-record will list every field in the top record in its "raw" state. Practice making a few changes this way including using the **[A]** for alter-field to edit an existing field.

Troubleshooting

This section is designed to anticipate and help with some of the common problems and questions people may have when using Masterfile. It is meant to be a quick reference guide and inevitably recaps on some of the information given already in the manual. It is NOT a substitute for reading the manual.

Display and Printing Problems

PROBLEM: The data will not display on screen.

Have you defined a format? Have you selected the correct format for the data you want to display? Read the section on "Arranging The Data"

PROBLEM: Parts of the Data are truncated, or scroll when they appear.

The 'window' you have defined for the data is not big enough. Read The Section on Record Data Items.

PROBLEM: Data is missing, or duplicated.

Have you selected, and are viewing, parent records with a format designed for children, or vice versa? Have you selected BOTH parent and child records when you only needed to select one of them? Read the section on Relational Data.

PROBLEM: Only one record will appear per screen/page.

Have you put record data into the format Heading Area? If not then there is probably not room for more than one record. Read the Section on Arranging The Data.

PROBLEM: All of the data will not fit onto one screen.

To make one record cross more than one screen you have to define two formats and switch between them in the display, a matter of only two keypresses.

PROBLEM: I don't like the colours used, or I can't make a colour change permanent, or I can only change the colours in half of the program.

To make a temporary colour change for the program menus use the COLOURS option of Main Menu. To make the change permanent enter it as a line in the BASIC header. Colours used for data display are set in the report geometry item of the format definition.

PROBLEM: Nothing will print on my printer.

Have you got the printer lead in upside down?

PROBLEM: I always get a double line feed on my printer.

This results with some combinations of printer and cable and many printers have dip switch settings to correct this, otherwise you can suppress one of the line feeds from within Masterfile.

PROBLEM: I don't get any line feeds on my printer.

Some printers may use different codes for a newline than those used in Masterfile. The correct values can be inserted into Masterfile.

PROBLEM: The printout overlaps the page boundary.

Have you specified the correct forms depth to Masterfile. See the Section on theReport Geometry. Does your printer know the correct page length you are using (see your printer manual for more details).

PROBLEM: The printout doesn't fit onto one line of the page.

When Masterfile puts a left margin onto the data printout it does so by sending the required number of spaces. Some printers do not allow more than 80 columns of standard print and if the margin " data is greater than 80 columns then an overlap may occur. This may take the form of the printing moving onto a second line, or it may move off the edge of the page. Use a smaller margin and data display, use condensed print or set the margins on the printer.

Entering and Manipulating Data

PROBLEM: What happens when I erase a data name that has already had data entered?

The data is still safe, under its given data reference code, but you will not be PROMPTED to add more data under this heading. It is sensible to produce one printout of Data Names that includes EVERY field you have defined, even if you later want to remove selected ones from the list to suppress the prompts.

PROBLEM: Why are some of my fields not appearing when I export data?

Whilst you can define fields that have no data names only those that appear in the data name list are exported.

PROBLEM: Why does the Sort routine keep abandoning when it meets a certain record?

On the 6128 version there is a 4K limit on record size for sort purposes. You can enter larger records than this but the sort is abandoned when one is met.

PROBLEM: Why do my function key definitions never progress past a sort or print?

Both of these functions constantly check the keyboard to see if you are trying to [ESC]ape from them. Doing so 'swallows' any remaining characters fed into the keyboard buffer by a function key. They should be placed last in any key definition that calls them.

Appendix 1 :

Memory Organisation

These details are provided for those who feel they would like a greater technical understanding of how Masterfile works, or for the more ambitious who want to squeeze in some BASIC RSX's etc. There is certainly no need for every user of Masterfile to study or understand the following.

Masterfile 464/664

Because we haven't got the advantages of memory bank switching to protect our data Masterfile 464 needs to make careful use of HIMEM. Before loading Masterfile we should perform a full system reset before hand so that HIMEM is set to the correct value.

When loaded the Masterfile memory map is as follows. &000-&170 Reserved for firmware use. &170-&37F Masterfile Basic Loader. &37F-&2740 (approx) Mastcode main program logic. &2740-&AC00 (approx) Data file built from low address upwards, the highest address depends on the hardware configuration which sets initial HIMEM. &AC00-&FFFF Stack, firmware data and screen map.

Masterfile 128

The Basic environment of MASTERFILE 128 has a MEMORY ceiling of &2FFF, which therefore allows about 12K for the loader and USER BASIC.

The 4K space between &3000 and &3FFF is used for file buffers and other work space.

The 16K space between &4000 and &7FFF is a "window" through which the extra RAM(containing the file) is viewed, one quadrant at a time.

The main program logic resides from &6400 upwards. This partly overlaps the file space window, but memory bank-switching keeps all the plates in the air.

The secondary 64K RAM bank is used for the file.

Appendix 2 :

Differences from

Masterfile vers. 1.1

For reference purposes we have detailed the way the supplied programs differ from the original Masterfile 464. Most of these differences are purely operational and will not affect the structure of the files produced, ensuring that data can be passed freely from one version to another.

Sort and Print can be abandoned by using the **[ESC]**ape key.

Masterfile no longer checks to see whether the printer is ready. This does not hang up the program since the **[ESC]**ape key can be used to return to the previous menu. However it does mean that printout can be obtained via an attached RS232 interface board.

Single sheet printout is catered for.

CR and LF are sent to the printer in preference to CR only.

The sort key character '\ ' can be altered to another ascii character.

[CTRL]-SPACE is used by the data editor to insert spaces, although the **[CTRL]-CURSOR UP** combination will also work if you have become used to that combination.

There is a tape/disc option explicitly chosen from the Load/Save menu. Tape speed is set at saving time.

Masterfile no longer loses track of the variable HIMEM if you try to RUN it again after entering Basic.

Masterfile 128

The memory used status line has been changed to display kilobytes used rather than bytes.

There is a 4K limitation on the size of records for sorting, but sorting and CAT options can still take place even if the filespace is completely full.

There are certain changes made to the Basic Loader, notably the absence of a pre-set routine to Back Up Masterfile. The presence of User Basic entry points mean that the loader should be treated with respect.

Data Export, Data Merge and User Basic have been provided. These options are available for the 64K version as a separate Masterfile Extensions Program available from Campbell Systems.

Appendix 3 :

Glossary of Terms

ADD

Insert a new record onto the end of the file

AMSDOS

The name given to the CPC's own operating system. Amsdos programs only work on computers of the same make.

ARGUMENT

The thing with which records are compared in Search mode

ASCII

A standard code which assigns a number to each letter or symbol in the alphabet. Being standard, it allows communication of data between various computers.

BACK OUT

Change your mind

BACK UP

A security copy of the program or data.

BASIC LOADER

A few lines of BASIC that organise the loading and starting of the Masterfile machine code, and sets up colours, entry points etc.

BEEP

A sound made to warn of a possible, or definite, error.

BYTE

A unit of computer memory.

CALLS

Commands that start a machine code routine running, similar to BASIC's GOSUB command.

CHILD

Record with an [↑] field that connects it with a corresponding parent.

CLR

This key deletes the character under the cursor, and if held down sucks characters up from right to left.

COMMA DELIMITED

A format of data storage where each packet of data is within double quotes and separated from the next by a comma.

CP/M

An alternative operating system available on the CPC which allows programs to be run on a variety of different computers.

CR

The code for 'carriage return' which moves the cursor to the left hand side of the screen, or moves the printer head to the left of the page, sometimes this code also causes a line feed at the same time.

CRASH

An irretrievable computer error.

CURSOR

A blob on the screen where your response is echoed as you type

CURRENT RECORD

The record on which alterations and amendments can be made in display mode or from User Basic.

DATA

Information in a field

DATABASE

A big word for a file

DATA EXPORT

Sending Masterfile data to other programs, with the option of packaging the data in different ways to meet their requirements

DATA MERGE

Adding two short files into one long one.

DATA NAME

Word or phrase describing the use of a data reference, there to make it easier for you.

DATA REFERENCE

A unique code character that identifies each field within a record.

DEFAULT

The number or text that comes into force if you do not deliberately make changes or enter an alternative.

DEL

This key erases the character to the left of the cursor, if kept depressed it will run along the text from right to left.

DISPLAY MODE

Where selected records are viewed, as styled by a format

DOWN-LINK

'>' field in a parent record used to identify its children

EDITOR

The means by which text entries can be corrected, using a selection of control keys.

ENTRY POINTS

The start points of the different User Basic commands, each point can be called to produce a different effect.

EOF

End-of-file. Some programs use a special character to signal that EOF has been reached, others work it out from the file length.

EXIT

Usually means return to previous menu, or to main menu

EXPANSION TOKEN

A special character, associated with the function keys, which when printed can be made to produce a string of characters.

EXTENSION PACK

A program that is available to allow User Basic, Data Merge and Data Export to be used with the 64K version of Masterfile.

FIELD

The smallest individual unit of Data, 1-240 characters long

FILE

All records and associated data names and formats

FILENAME

To be compatible with the CP/M disc filing utilities a filename must be no more than eight characters long, consisting only of letters and numbers.

FILLER

Character repeated three times if data is absent

FLAG

A marker, associated with each record in memory, which is used to denote it's selected status.

FORMAT

A set instructions to Masterfile specifying a screen/forms layout

FORMAT REFERENCE

A single character identification of a format

FORMAT SWITCHING

A means of rapidly displaying different aspects of the data, or of displaying more data per record than would fit on one screen.

FORMS DEPTH

The total number of lines, at standard spacing, that would fit from top to bottom of the paper you are using.

FORMS MARGIN

The number of characters, up to 50, by which the printed output should be displaced from the left of the page.

FUNCTION KEY

A key that can be programmed to produce a specific effect, or series of such, when pressed.

HA

Abbreviation for Heading Area

HEADING

Static text displayed to emphasise or clarify the data.

HEADING AREA

Optional Display area between title line and RA's, printed once per page or screen

IDENTIFIER

A two character code that can be used to prefix each field of text sent by data export. It consists of ampersand (&) followed by the character of the data reference code.

INFINITE PAGE

A means of printing records out on continuous paper such that the heading area text is only printed once.

INVERT

Flip select status of all records

ITEM

A component of the format specification, each format will consist of many items.

LEADING SYMBOL

A character that can be used to prefix numeric data when it is displayed on screen e.g. '£'.

LF

The code sent to the printer, or to the screen cursor, to signal that a new line should be started.

LINE BREAK CODE

The character ‘_’ which signals a new line when the data is to be displayed.

LIST FILE

A simple file where each record stands alone, containing all the information pertinent to that record. The alternative is a relational file.

MAIN MENU

The menu offered when the program is first loaded.

MEMORY BANK SWITCH

Mechanism to select a 16K RAM from the 128K bank, for access via the address window &4000-&7FFF.

MENU

A list of options from which to choose.

MODE 2

The screen display mode of the CPC computers that produces 80 columns of text across the screen.

NUMERIC DATA

Data that consists only of numbers, and one optional decimal point, can be handled in certain specific ways, e.g. totalled.

ORDER

Sort into a logical sequence.

ORPHAN

Child with no matching parent.

PARENT

record with an [>] field that connects it with corresponding children.

PASSWORD

The password is given when you want to ‘LOCK’ the Main Menu of Masterfile to protect a confidential file.

PRINTER CONTROL CHARACTERS

A series of unprintable characters that signal to most printers that certain effects such as 'underline' are required.

PROMPT

Where the program waits for your data or other information, usually after printing some explanatory text.

PURGE

Erase all selected records

QUESTIONNAIRE

A list of options, most of which contain default values, used when designing a screen/page format.

RA

Abbreviation for record area

RAM

Random Access Memory - better defined as alterable memory

RECORD

A set of data fields collected into a logical group

RECORD AREA

1 or more lines in which a record's data is displayed

RELATIONAL

Of a file that has Parent and Child records, for greater efficiency of data storage

REPORT

Loosely, the display style generated by a format specification

REPORT GENERATOR

The technical term for that part of the program that displays data on screen, or on paper, and which adds explanatory text.

REPORT GEOMETRY

The part of the format design process that establishes the overall layout of the screen or page.

RESET

Unselect selected records

RIGHT JUSTIFY

Fitting data text up against the right edge of its defined window, rather than the left.

RS232

An optional interface that can be added to your computer to allow the use of certain makes of printer, or to allow data to be sent from one computer to another.

RULED LINES

graphic embellishments to screen display

SCAN

The option to look for a given argument ANYWHERE within the specified data field text.

SEARCH MODE

Where records are systematically selected or unselected, usually on the basis of the information they contain

SELECTED

Of a record; one eligible for display, amendment etc.

SORT

Physically re-arrange records into order based on some logical criteria.

SORT KEY CODE

The '\ ' character is used to designate which part of the data text is to be used as the basis of the sort process.

STATUS LINE

The bottom line on the opening screen, that gives essential details about the file.

STR\$

The BASIC function that converts a number to its literal string equivalent so that it can be handled as text.

SYNTAX

The rules of grammar imposed by the computer to ensure that it understands what you mean.

TITLE

Description of a format for your reference. It is displayed on screen, not printed.

TOGGLE

A sort of switch that allows you to flip between one program state and another.

TOP RECORD

The displayed record that is currently available for amendment and updating.

UNSELECTED

Records that are to all intents and purposes invisible. Most Masterfile operations ignore them entirely until they are re-selected.

UP-LINK

'↑' field in a child record, used to identify its parent

UPDATE

Alter an existing record

VAL

The BASIC function that converts a given text string into a number.

WORD DELIMITER

A character that is used to separate one word of text from another. Masterfile uses three such - space, backslash and the underline character ([SHIFT]-ZERO). Other programs may also use punctuation marks such as commas.

WORD-PROCESSING

Where text is displayed intelligently to give the best form of display.

[...]

the square brackets denote that the key with the word or letter within should be pressed

[>]

The special data reference code that signifies a parent record. Followed by an identifying character or string of characters.

[↑]

The special data reference code that signifies a child record. Followed by an identifying character or string of characters.

[*]

Stands for 'ANY FIELD' when specifying a Scan Search.

[\\]

Sort key character.

[_]

A line break character. Data is entered as a single line of text, but can be displayed over several lines by the use of this.