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DB MASTER ™

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STONEWARE ™
MICROCOMPUTER PRODUCTS
50 Belvedere, San Rafael, CA 94901 (415) 454-6500

DISCLAIMER OF WARRANTIES

FORWARD

You will soon learn how to place important records, tasks and information into your computer--forming a foundation of data for your use. D B MASTER gives you many powers of manipulation over this Data Base. You will design, create and use a system tailored to your needs of today and for years to come.

To prevent needless confusion, error, wasted time and energy, please note the following suggestions:

Each file created using D B MASTER'S Program diskette will generate at least TWO additional diskettes:
A MASTER or DATA diskette, which contains your records.
A UTILLITY diskette, which stores the file structure, report formats, etc., for your file.

Do not rush to create your system. Take time to explore and understand all of D B MASTER'S features BEFORE you create your working system. Design your files and reports on paper before you place them in the system.

Your computer and Data Base Disks should always be treated with the utmost respect.

Keep your working environment as static free and dust free as possible-both can destroy or damage your system.

Copy your files everytime you change them. Always keep at least two generations of back-up diskette copies.

Invest in a AC/voltage surge protector to prevent accidental damage to your files.

Instruct others who will be using your system in its proper use and care.

Before attempting to use any of D B MASTER'S print options make sure you have set the correct Printer Parameters for your printer (see pages 108-111).

Always keep a hard copy of your File Statistics available for reference.

ABUSE OF YOUR SYSTEM MAY MAKE IT USELESS WHEN YOU NEED IT THE MOST!

D B MASTER QUICK GLOSSARY

DATA BASE - A filing system of specific data organized for a particular application.

DYNAMIC PROMPTING(TM) - The screen display of user options and commands.

FIELD - An item of information.

PAGE - Screen display of fields.

FORM - Screen display of up to 9 pages.

RECORD - A form in which information has been entered.

FILE - A unique system of data storage, consisting of many individual records using the same form.

FIELD TYPE - Fields designed for a specific kind of data (alphanumeric, numeric, date, etc,).

PRIMARY KEY - A combination of up to four fields which will make each record unique and quickly accessible.

BYTE - A unit of internal storage.

KEY LENGTH - The number of bytes needed to store the primary key.

SECONDARY KEYS - Fields you designate for rapid retrieval other than the first primary key.

D B MASTER PROGRAM DISKETTE - The disk supplied in this package.

MASTER or DATA DISKS - Disks that hold the actual records entered in a file.

UTILITY DISKS -Disks which store all "housekeeping" information for a file.

SORT FILE DISKS - Disks created and used in a report where sorted files are temporarily stored before they are printed.

BACK-UP DISKS - Copies of utility and master disks created daily to enable you to recover if your files are destroyed or damaged.

PRINTER PARAMETERS - User specified instructions so D B MASTER will work with your printer.

NEW POLICY ON TELEPHONE SUPPORT FOR D B MASTER

Due to the increasing amount of software "piracy" occuring in the personal computer industry, we have been forced to institute a new policy concerning telephone support for D B MASTER. Beginning immediately, all callers will have to give a registered D B MASTER serial number before questions will be answered. For those who have just purchased the program, a seven day grace period will be allowed, after which no more calls will be answered until their signed registration card is received. To find out your serial number and revision number, simply boot your D B MASTER program diskette. Both numbers will appear on the first display screen. PLEASE HAVE YOUR SERIAL NUMBER AND REVISION NUMBER HANDY WHENEVER YOU CALL STONEWARE FOR SUPPORT!

Our telephone number is 415-454-6500.

Please remember, our office hours are from 9am to 5pm Pacific Time, Monday through Friday.

PLEASE NOTE OUR NEW ADDRESS:

Stoneware Microcomputer Products
50 Belvedere Street
San Rafael, California 94901

REPLACEMENT OF DAMAGED DISKETTES

All requests for replacement diskettes must be made in writing. You must include the damaged diskette and a check for $15.00. This service is available to properly registered users!! Sorry, we will not be able to replace a diskette without having received it.

APPLE III OWNERS

This version of D B MASTER may be used with an Apple III in its Apple II Emulation Mode.

GUIDELINES FOR FILE BUILDING

Maximum PRIMARY KEY LENGTH is 35 bytes within FOUR fields

Maximum RECORD LENGTH is 1020 bytes

Maximum NUMBER OF FIELDS is 100

When you reach the maximum record length or the maximum number of fields permitted D B MASTER will automatically STOP file creation and place you in the Edit Mode for that page. There is no screen message reminding you that file limitations have been reached. The Record Length prompt will flash as you approach the limit.

Design all your files and reports on paper and print a copy of your File Statistics after a file is created.

INTRODUCTION

1. Hardware Requirements:

D B MASTER requires an Apple II* or Apple II Plus* computer with 48K of RAM memory, Applesoft Basic in ROM (or the Language System) and at least one "floppy" disk drive. A MINIMUM OF TWO DISK DRIVES IS RECOMMENDED for efficient operation without frequent "disk swapping." (The program will support up to 4 disk drives.) Special versions of the program are also planned for use with other disk systems, including those manufactured by Corvus, Lobo, Cameo Systems and Sorrento Valley Associates. Check with your Stoneware dealer for availability.

The program is designed to make use of Apple's new DOS 3.3, 16-sector disk operating system. The disk controller in Slot #6 MUST have the 16-sector PROMs installed, or D B MASTER will not "boot." The 16-sector PROMs are supplied with the Language System or with DOS 3.3, and come installed in the new DOS 3.3 disk controllers. If you are not sure which PROMs you have, please ask your local Apple dealer to assist you.

D B MASTER MUST be "booted" on a drive connected to Slot #6, Drive #1. (The program must be booted directly, since it uses its own DOS, and its program modules cannot be loaded from regular DOS or Basic.) Additional disk drives should be connected to Slot #6 Drive #2, Slot #5 Drive #1, and Slot #5 Drive #2, in that order. Other slot/drive combinations may be used, but they will require an extra step each time D B MASTER is "booted up."

A printer is also recommended in order to make use of D B MASTER's powerful report generator. The program will work with all three of Apple's interface cards (Parallel, Communications, and High Speed Serial), as well as the California Computer Systems Parallel and

- 1 -

Asynchronous Serial Interfaces, and will support printer widths of up to 132 characters per line. In addition, special control characters may be sent to your printer (or interface card) at the beginning and end of each printout. This allows the use of many other manufacturers´ interface cards, and of the special features built into some printers.

NOTE: No provision has been made for the use of printers or printer interfaces that require special software "driver" programs. This includes those that use the Apple´s "Game I/O" (the game paddle socket) for a printer interface. If you have to load a special program before you can use your printer, you probably will NOT be able to use D B MASTER´s printer routines!

Finally, D B MASTER will look for a Mountain Hardware or California Computer Systems Apple clock or Thunderware´s Thunderclock installed in your system. If you have one, the program will read the current date from the clock. (The clock may be installed in any slot.)

NOTE: If you wish D B MASTER to work with a California Computer Systems clock, the clock must be set up to work in the "Mountain Hardware Emulation" mode. See the manual supplied with the clock for further details.

NOTE: As this manual goes to press, there are a number of new clock calendar cards about to be introduced for the Apple II. We will try to add support for these clocks as they become available. For further information, contact your local Apple dealer.

*Apple II & Apple II Plus are trademarks of Apple Computer Inc.

2. A Few Comments About Diskette Quality and Treatment

A. Floppy diskettes for use with the Apple II computer come in a wide range of price and quality. Although paying a high price for diskettes is no guarantee of quality, if you use the cheapest diskettes available you can be pretty sure that they are not the best.

YOUR DATA FILES ARE IMPORTANT TO YOU - ISN'T IT WORTH AN EXTRA $.50 OR $1.00 PER DISKETTE TO BE SURE THAT YOU ARE WORKING WITH TOP QUALITY MATERIALS?

B. Secondly, even the best quality diskettes can suffer from the wear and tear of day to day use. WE HAVE FOUND THAT THE ADDITION OF A REINFORCING RING TO THE CENTER HOLE OF YOUR DISKETTES IS A BIT OF EXTRA INSURANCE - THEY WILL LAST LONGER AND WORK MORE RELIABLY. In fact, adding such a ring is one way to fix a diskette which is returning I/O errors. One such product is called "Floppy Saver," and costs about $.16 per diskette. Check with your local computer store for availability.

C. Sometimes a disk drive will not "seat" a diskette properly when it is first inserted. It is a good habit to gently open and close the disk drive door once or twice each time you insert a diskette into a drive.

D. If you enter a CTRL/C, press RESET, turn the power off, or otherwise abuse the system while the disk drive light is turned on, you stand a very high probability of destroying your file. Please treat your hardware, software and diskettes with respect.

E. "The best laid plans...." etc.   Please back up your files frequently, and use Daily Update Lists (a convenient way of printing all of the changes that have been made) whenever you make changes to your file!

3. Why Your Disk Drive Sometimes "Buzzes"

D B MASTER uses two different versions of its disk operating system. In switching back and forth between the version which communicates with the data diskettes (and produces copiable diskettes), and the version which is used by the program (uncopiable) diskette, the operating system will sometimes cause a disk drive to "buzz". Although the sound is slightly annoying, it will not cause any damage or wear to your drives.

4. A Note About The Use of Control/C's

As you may be aware, Applesoft Basic uses a Control/C
input as a break command. We have done as much as
possible to "trap" Control/C's in such a way that they
will not "crash" the program. In most cases, an
unexpected Control/C will either be ignored or return
you to the Main Menu. However, there is a limit to the
amount of error trapping that can be done. If you
follow a few simple rules, you should never have a
problem with Control/C's:

1. Only use Control/C when it is listed in the Dynamic
Prompting (TM) at the bottom of your screen as an
available option. At those times the program is
expecting it, and knows how to handle it.

2. Never enter a Control/C while the program is
printing something on the screen or on your printer.
Wait until the flashing cursor appears and the program
is awaiting your input. Don't "type ahead" in
anticipation of the next input request - wait for the
program.

3. NEVER ENTER A CONTROL C WHILE A DISK DRIVE IS
SPINNING!! That is a sure way to destroy a file!

5. What is Data Base Management?

There are probably as many definitions for data base management as there are programmers writing or working with data management systems. Hierarchical, network, relational, CODASYL and other terms describe concepts which were developed in large computer environments and which are beginning to filter down to the realm of personal computers. Such systems are usually designed for programmers to use insystem development. They are NOT generally intended for end users.

When Apple's File Cabinet and similar programs first appeared, the term data base management was applied to programs of more limited scope. These programs generally do not allow for user-defined connections or "relations" between records containing different kinds of information. On the other hand they are designed (with varying degrees of success!) for the end user, requiring little if any knowledge of programming.

Today there are at least twenty such programs for the Apple alone, so obviously there are many applications where a sophisticated data base is not required. On the other hand, there has been a widespread demand for a BETTER Apple DBM - one which would be more flexible, faster, capable of handling larger files, and which at the same time would be easier to use. It is this demand that D B MASTER was designed to fill.

Although D B MASTER has the flexibility to imitate some of the more complex file structures (see Emulating a Hierarchical Data Base), it is closer IN CONCEPT to File Cabinet than to, for instance, a CODASYL data base system. And while it might be more accurate to call D B MASTER and similar programs file, record, or list managers, we will continue to use the term data base management as it has come to be understood when dealing with personal computers:

DATA BASE MANAGEMENT INCLUDES THE CREATION, STORAGE, EDITING, MANIPULATION, AND PREPARATION OF REPORTS BASED UPON, A FILE OR FILES, EACH CONTAINING A GROUP OF RECORDS WITH SIMILAR INFORMATION ORGANIZED IN A MANNER UNIQUE TO THAT FILE.

NOTE: Files created using D B MASTER will generally NOT be accessible to other programs.

6. How This Manual Is Organized: And a Few Words
About D B MASTER

D B MASTER was written with the conviction that people
like to have nice complete operating manuals, but that
they don't like to read them. With that in mind, the
program was designed to be as "user friendly" as
possible.

The concept of "Dynamic Prompting"(TM) was developed
and used throughout the program. With Dynamic Prompting,
the bottom two (and sometimes three) lines of the
screen are reserved for a list of available options and
whatever other information the user may need.
Unfortunately, the Apple's 40 column screen
necessitates the use of a number of abbreviations, but
the information will still be reasonably self-
explanatory.

Because of the Dynamic Prompting, you will find that D
B MASTER requires very little memorization. Once you
have used one of the program's features, it should
rarely be necessary to refer back to this manual.

The manual has been organized into three sections:

I. Building Files & Accessing Records
II. The Report Generator, and
III. File Maintenance

The manual also includes a tutorial which will take you
step-by-step through the creation and use of a simple
file (an expanded mailing list). The tutorial is
divided into sections which may be found at appropriate
points throughout the first two parts of the manual.

It is suggested that you read through the manual,
following the steps of the tutorial as you find them.
The best way to learn to use the program is to try out
each feature on your computer as soon as you have read
about it. Before you know it, you will be a master at D
B MASTER!

NOTE: Throughout this manual and the program itself you
will find references to the "CONTROL KEY." This is the
key labeled "CTRL," which is located to the left of the
"A" key on your keyboard. The control key works like

the shift key: it does nothing by itself, and must be used with another key. You must press it first, then hold it down while you depress the other key. For instance, if the program says "CTRL/N => NEXT PAGE," you must press the control key and, without releasing it, also press the "N" key. The next page will then be displayed on your screen. Note that in most cases the control character will be the first letter of the command. This makes it easier to remember which key to use (although they will also be listed on your screen). It is not necessary to press the RETURN key when entering control characters.

7. The Reset Protector

We have provided a small rubber washer which may be easily installed in your Apple's keyboard to prevent the accidental use of the RESET key in the upper right hand corner of the keyboard. THIS PROCEDURE IS NOT NECESSARY ON APPLES WITH THE NEWER STYLE KEYBOARDS (generally those delivered since early 1980).

To determine if you have a new keyboard, carefully remove the lid of your Apple. Now look inside the computer at the space underneath the keyboard. If there is a second, smaller circuit board ATTACHED TO THE MAIN PORTION OF THE KEYBOARD, then you need not install the protector. Instead, check the directions that came with your computer to be sure that you are set for the "Control/Reset" mode, that is, that you must hold down both the Control and the Reset keys before Reset will have any effect.

NOTE: THE FOLLOWING PROCEDURE MAY VOID YOUR APPLE'S WARRANTY. STONEWARE DISCLAIMS ALL LIABILITY FOR ANY DAMAGE WHICH MAY RESULT FROM THE INSTALLATION OF THIS MODIFICATION.

Now that that is out of the way, don't worry. This is really quite safe and easy.

First turn off your computer and unplug the power cord. Now take a kitchen knife or a small screwdriver and carefully slip it under the plastic keytop that says RESET on it. Gently pry the keytop off of the key.

When you have removed the keytop you will see the white plunger of the key itself (see illustration). Take the small rubber "O" ring supplied with your D B MASTER package, and slip it over the key so that it sits around the plunger, and between the black body of the key itself and the flat horizontal portion of the plunger.
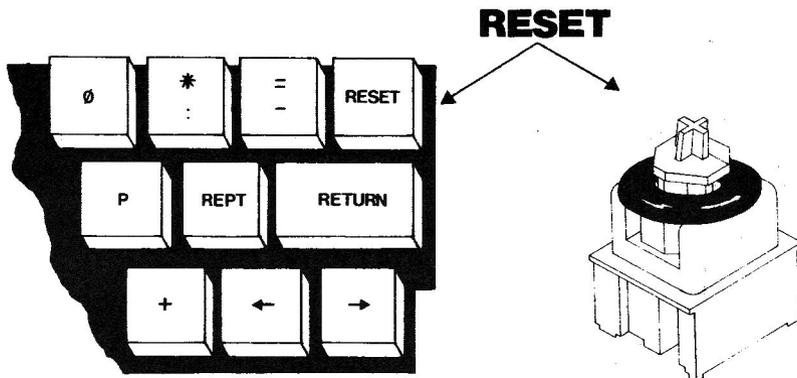
RESET

Finally, replace the keytop by pressing it back over the plunger, plug in your computer, and your are finished!

The object of this procedure is to make it harder to press the Reset key. With the ring installed, it is nearly impossible to accidentally press the key hard enough to have an effect. When you DO want to use the Reset key, press firmly (but not too hard!), then release the key. NOTE THAT THE KEY WORKS WHEN IT IS RELEASED, NOT WHEN IT IS BEING PRESSED. If you press too hard waiting for the "bell" to ring, you are only likely to damage your keyboard. A little bit of experimentation will show you the proper amount of pressure to use.

(Our special thanks to Ken Silverman and the San Francisco Apple Core for the reset protector idea.)

8. Getting Started

IN ORDER TO RUN D B MASTER, YOU MUST HAVE A 16 SECTOR (DOS 3.3) DISK CONTROLLER INSTALLED IN SLOT #6. SEE "HARDWARE REQUIREMENTS" FOR ADDITIONAL INFORMATION.

NOTE: It will be assumed throughout this manual that
the reader is already familiar with the operation of
his or her Apple. If you don't know how to "boot" a
disk yet, it is suggested that you spend a couple of
hours studying the first 2 or 3 chapters of the Apple
DOS manual and some of the programs on the Master
Diskette that came with your disk drives. Then you will
be ready to learn about D B MASTER.

Insert your D B MASTER diskette into the disk drive
connected to Slot #6 Drive #1. Now "boot" D B MASTER by
entering PR#6 from Basic ("^" prompt) or 6(control/p)
from the Monitor ("*" prompt) or by just turning the
power on if you have an "Auto Start ROM" in your system.

NOTE FOR USERS WITH THE "LANGUAGE CARD" If you have a
standard Apple II (Integer Basic in ROM) and a Language
Card, you must FIRST BOOT A DOS 3.3 MASTER DISKETTE.
The master diskette will load Applesoft Basic onto the
Language Card for you. Then insert your D B MASTER
program diskette into the disk drive connected to slot
#6, drive #1, and type "PR#6." If you have an Apple II
PLUS and the Language Card, this procedure is not
necessary.

After the program's title page has been displayed, you
will be asked how many disk drives you have connected.
Respond by entering the proper numeral and pressing the
Return key. (NOTE: see Appendix for setting up
non-standard slot/drive assignments.) This information
is now "hidden" in your Apple's memory, and unless you
turn the power off, "boot" a normal DOS diskette, or
run another program which uses the space where it is
"hidden," you can re-boot D B MASTER and the system
will still know how many drives you have. (The same
will be true of the current date.) In such a case you
will not be asked for the number of drives again.

Next your Apple will "beep" and prompt you to insert
the "Utility" disk for the file you wish to use into the
proper disk drive, or to press the "ESCape" key if you
wish to create a new file. The first time you run D B
MASTER, you MUST press ESC at this point, since you
have not yet created a Utility disk. (More about
Utility disks later.)

You are now ready to create your first D B MASTER file!

9. Origins of D B MASTER

D B MASTER was developed by a team of programmers. The ISAM file management and disk operating systems were designed by Stanley Crane and Jerry Macon, of Alpine Software, Inc., and coded by Don Holmgren. The functional design, including the user interface and Dynamic Prompting (TM) were developed by Barney Stone. Additional design work and the implementation of the combined system were group efforts. This manual was written by Barney Stone.

Special thanks are due to several people from Apple Computer. First of all, thanks to Jim Hoyt, who first got us in touch with each other. Thanks also to Andy Hertzfeld for being generally helpful. And last but not least, our thanks to Woz, who made the whole thing possible.

PART I - BUILDING FILES & ACCESSING RECORDS

CHAPTER 1: BUILDING A FILE

1. Password Protection

Three levels of optional password protection are available with each file that you create with D B MASTER. Password protection may be requested when you create your file, or added to the file at a later date. Passwords are assigned on a file-by-file basis. Each file may have its own passwords, or some of your files may share the same passwords. Others may have no password protection at all.

All files MUST have a Master Password. If you have not requested password protection, the Master Password will only be requested if you wish to add passwords to the file at a later date. Otherwise someone else could add passwords to your file, and you would have no way of accessing your own data!

Each time a file with password protection is accessed, the user will be asked for a password. Assuming that a proper password is entered (the user gets three tries before the program quits), one of three levels of system access will be available:

1. READ ONLY users may only display records. They may not add, edit or delete records, or print reports. Also, certain "read protected" fields may be hidden from their view. You will choose which fields, if any, will be hidden, when you create your file.

2. READ/WRITE users have full access to the system. Their only restriction is that they may not change system passwords.

3. MASTER password users may also use all of the features of D B MASTER. In addition, they are the only users who may change, add, or delete file passwords.

DB MASTER IS
EASY TO UNDERSTAND

Think in terms of creating a form on paper:

(1) EACH ITEM OF INFORMATION
IS CALLED A "FIELD."

CLIENT #

NAME

ADDRESS

CITY

STATE _____ ZIP

ORDER DATE

AREA

(2) THE FIELDS THAT ARE
DISPLAYED ON YOUR VIDEO
SCREEN AT ONE TIME ARE CALLED
A "PAGE."

(5) ALL OF THE RECORDS USING
THE SAME FORM ARE COMBINED
AND STORED TOGETHER AS
A "FILE."

(4) EACH FILLED-IN FORM IS
CALLED A "RECORD."

(3) ONE TO NINE PAGES ARE
COMBINED INTO A "FORM."
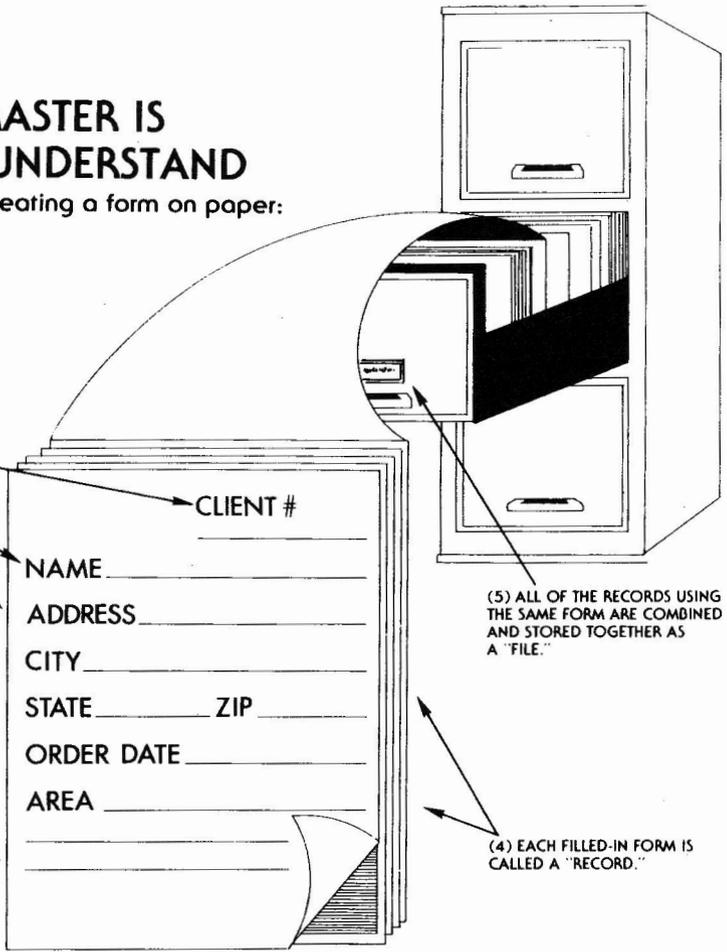
FIELD, PAGE, FORM, RECORD and FILE: DB MASTER's MOST IMPORTANT "BUZZWORDS."

If you enter the same word for two or all three of the passwords, the user will get the highest level of access associated with his or her password.

Passwords should only be requested if you need them. Otherwise the extra step of entering a password each time you access a file may become an unnecessary nuisance.

2. Tutorial - Part 1 - Introduction

The best way to learn how to use a program like D B MASTER is to use it. The purpose of this tutorial is to take you step by step through the creation and use of a typical data base - in this case a mailing list with a few extras built in.

The tutorial is divided into two sections, each of which you should be able to complete in an hour or two. This first section will deal with creating a file, entering records into the file, and then searching for and editing records. The second section will deal with printing reports and mailing labels.

(If you have not already "booted" your D B MASTER program diskette, please refer back to "Getting Started.")

NOTE: D B MASTER requires two blank diskettes when you begin a new file. You should have two blanks ready when you begin this tutorial. They do not have to be initialized. IF THE DISKETTES ARE NOT BLANK, ANY DATA OR PROGRAMS ON THEM WILL BE ERASED!

D B MASTER will now ask if you want password protection for your new file. This is the first step in file creation. For the sake of this tutorial, answer yes by entering a "Y" and pressing RETURN.

3. Screen Forms & How They Work:

The screen will now display a "form" for the input of your passwords. Note that D B MASTER makes use of its own screen forms, as well as the ones that you will create. For the most part, all screen forms will follow the same operating rules:

1. Move to the next field by pressing RETURN.

2. Back up to the previous field by pressing ESCape (the key marked "ESC").

3. Each field type will accept certain "legal" characters. Any other input will be ignored except for a single "bell" from the computer.

4. You cannot overtype the legal length of a field (indicated by the underlines).

5. If there is a default value (pre-set field contents, displayed instead of the underlines), you may accept the default by pressing RETURN. Typing any other character will wipe out the default, display the legal field length, and allow you to enter a different value.

6. The backspace (left arrow) key will backspace within a field, erasing characters as it goes. The right arrow will not work within a field.

Now enter three passwords for first file. Passwords may include most of the characters on the Apple's keyboard. Be sure you remember them, or you won't be able to get into your file! (Try using ONE, TWO and THREE. They're easy to remember, and you can always change them later - assuming that you've remembered the Master Password!)

That's all it takes to set up your passwords. We'll continue with this tutorial in a few pages. But first....

DYNAMIC PROMPTING™ LISTS ALL OF THE INFORMATION YOU NEED ON YOUR VIDEO SCREEN

A TYPICAL D B MASTER DISPLAY:

THE CURRENT FILE NAME WILL USUALLY BE FOUND HERE.

THE FLASHING WHITE SQUARE IS CALLED THE "CURSOR". IT TELLS YOU WHERE THE PROGRAM WANTS ITS NEXT RESPONSE.

THE CURRENT FUNCTION IS DISPLAYED HERE.

THIS MEANS THE ESCAPE KEY, LABELED "ESC", IN THE UPPER LEFT HAND CORNER OF YOUR KEYBOARD. (PRESSING ESC WILL PUT YOU IN THE EDIT MODE.)

```
DISPLAY => FILE NAME                P.1 OF 2
LAST NAME     _____
FIRST NAME    _____
CUSTOMER NUMBER   _____
    PHONE #   ___-___-____
   BIRTHDAY   __-__-__
       AGE    __
ESC=>EDIT, RET'N=>NEXT PAGE, CTRL/C=>MENU
CTRL:  /N=>NEXT REC.  /P=>PRINT /F=>FIND■]
```
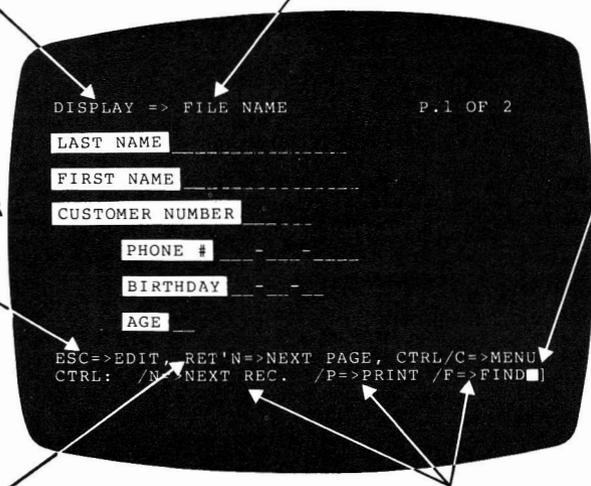
ABBREVIATION FOR THE "RETURN" KEY ON YOUR KEYBOARD. (PRESSING RETURN WILL DISPLAY THE NEXT "PAGE" OF THE CURRENT RECORD.)

THESE ARE ALL "CONTROL" FUNCTIONS. TO USE THEM, HOLD DOWN THE "CONTROL" (CTRL) KEY AND THE OTHER KEY (N,P,F,C, ETC.) AT THE SAME TIME. EXAMPLE: PRESSING "CTRL" AND "N" TOGETHER WILL DISPLAY THE NEXT RECORD THAT YOU ARE SEARCHING FOR.

PRIMARY KEY CHANGE:

PRIMARY KEY MAY CONTAIN
    UP TO TEN FIELDS
MAXIMUM LENGTH=35 BYTES

IMPORTANT NOTE: BECAUSE OF LIMITED SCREEN SPACE, ONE COMMON OPTION IS NOT LISTED. WHENEVER THE CURSOR IS ON ONE OF THE FIELDS OF A SCREEN FORM (NOT AT THE BOTTOM OF THE SCREEN AS SHOWN ABOVE), YOU MAY "BACK UP" TO A PREVIOUS FIELD (ON THE SAME PAGE) BY PRESSING THE "ESC" KEY ONCE FOR EACH FIELD YOU WISH TO BACK UP.

4. Key & Byte Definitions

At this point it is necessary to define two more terms:
Primary Key and Byte.

D B MASTER is based on a filing system called ISAM (for
Indexed Sequential Access Method - don't worry, it's not
important to remember that). ISAM files are stored and
maintained in alphanumeric order. This helps you to
find records quickly, and avoids a lot of
time-consuming sorting of your records. But the system
needs to know which field (or fields) to look at when
determining in which order to store your records. For
this purpose we establish a KEY, which we will call the
Primary Key (there will also be Secondary Keys a little
later).

With D B MASTER, the first field in a record is always
the first field in the primary key. In addition, the
second, third and fourth fields in the file may be
added (in that order!) to the primary key. This is
important because PRIMARY KEYS MUST BE UNIQUE! That is,
no two records in a file may have identical contents in
their combined primary key fields. (D B MASTER will
warn you if you try to enter duplicate keys. Wherever
possible, we will keep you from making mistakes. That's
part of being "user friendly!")

For example, if you were designing a data base to
maintain a list of restaurants, with the name of the
restaurant as the first field, you would run the risk of
having to store two or more different Joe's Diners. So
you simply add a second field to the primary key called
Store Number. Now you can have Joe's Diner, #123 and
Joe's Diner, #124, and although the contents of the
first field are the same, the combined primary key
fields are different, and D B MASTER will be happy!

Likewise, you could add a third field called CITY to
the primary key. You could then have Joe's Diner #123
in San Francisco and Joe's Diner #123 in Philadelphia,
without having a conflict.

The only limitations are that "Auto Date" fields (see
Field Types, below) are not allowed in the primary key,
and that THE PRIMARY KEY MAY NOT BE LONGER THAN 35
BYTES.

A BYTE is generally equivalent to one character: that is, a letter, number or punctuation mark. In most cases the number of bytes in a field is the same as the field length. The actual storage space required is frequently less than this, but in determining key and record length we must use the maximum length that you have chosen.

The exception is that numeric fields (including Dollar/Cents fields, but NOT including Social Security, Phone Number or Date fields) are stored in a "compacted" form, so that the number of bytes required is usually less than the length that appears on your form. The rules for determining the length of a numeric field are explained under "Field Types."

When you are building your primary key, the length is displayed on screen as you build it. If you try to go over the legal length, you will be stopped and given a chance to start over.

NOTE: The length of the primary key is one of the main factors determining the maximum number of records which can be contained in your file. THE PRIMARY KEY SHOULD BE KEPT AS SHORT AS POSSIBLE (preferably 25 bytes or less), while still allowing you to keep the primary keys of your records unique. Whenever possible, use numeric fields in the primary key. A file with a key consisting of a single numeric field may be able to contain 32,767 different records, yet the primary key length would be only two bytes! (See below.)

4. Field Types

Each item of information on your form is called a "Field." Name, address, client number and amount due, for example, would each be a separate field.

D B MASTER has ten different field types designed for convenient, error-free data entry and for efficient data storage. When you create your form (thus defining your new data base), you will assign a field type to each field.

A. Numeric Fields are divided into three types:

1. 0 to 255: Small Integers are fields of 1, 2 or 3 characters which will hold positive integers from 0 to 255 (integers are whole numbers, i.e, numbers without fractions or decimal points) If you enter a larger number (256 to 999) into a Small Integer field, a bell will ring, and the field contents will disappear. You may then enter a smaller number. Negative signs and decimal points cannot be entered into a Small Integer field. SMALL INTEGERS REQUIRE ONLY ONE BYTE OF DISK STORAGE SPACE. Likewise, they will add only one byte to a key or record length.

2. +/- 32767: Large Integer fields may be 1 to 6 characters in length. They include whole numbers within the range +/- 32767. In other words, they may not be smaller than -32767 or larger than +32767. As with small integers, numbers beyond the legal range will not be accepted. A minus sign will be accepted as the first character in the field. (The "+" sign cannot be entered. Instead, it is "assumed" if there is no "-" sign.) Decimal points are not allowed. LARGE INTEGERS REQUIRE TWO BYTES OF DISK STORAGE SPACE. They add two bytes to the length of a key or record.

3. Floating Pt.: Real Number (Floating Point) fields may be 1 to 11 characters in length. They will accept numbers with or without decimal fractions, and of course they will accept a single decimal point. They must be in the range +/-999,999,999 (Note that commas MAY NOT be entered), and they must not contain more than 9 digits (the tenth & eleventh positions are for the minus sign and decimal point). A minus sign will be accepted as the first character. REAL NUMBERS REQUIRE FIVE BYTES OF DISK STORAGE SPACE, and will add 5 bytes to the length of a key or record.

NOTE: Since all numeric and dollar cents fields are stored in their binary form, a zero and an empty field are identical. Therefore, you need not enter a zero into such a field, and IF A FIELD'S VALUE IS ZERO, ONLY THE UNDERLINES FOR THE FIELD LENGTH WILL BE DISPLAYED. In addition, leading zeros to the left of the decimal point will not be printed. Because of this, numeric fields are not recommended for use as zip code fields. (See "A Note About Zip Codes", below.)

B. Dollar/Cents fields allow for convenient entry of monetary figures. These fields are pre-formatted with a "$" sign and 2 positions to the right of the decimal point for cents.

DOLLAR AMOUNTS APPEAR ON YOUR SCREEN FROM RIGHT TO LEFT - similar to the way numbers are entered into a calculator. (Of course, if you prefer the left to right entry used by the other fields, you may use a Real Number field for dollar amounts, but you will lose the automatic formatting.) A minus sign will be accepted as the first character entered into a Dollar/Cents field, but decimal points will NOT be accepted since there is already one on the screen. The back space key (left arrow) will delete characters one at a time, for the logical equivalent of a back space.

Dollar fields must be at least 4 characters in length (counting the decimal point, but not counting the "$" sign: $_.__) and may be as long as 11 characters. They will accept numbers in the range +/-$9,999,999.00 (again, commas may NOT be entered). DOLLAR/CENTS FIELDS REQUIRE 5 BYTES OF DISK STORAGE SPACE, and add 5 bytes to the length of a key or record.

Note that you must always enter the "cents" portion of a dollar amount, even if that means entering two zeros.

NOTE: Whenever possible, you should design your files so that you will not need to enter negative numbers. In particular, NEGATIVE NUMBERS SHOULD NOT BE USED IN KEY FIELDS! Due to the way in which negative numbers are stored by the Apple, and the way that D B MASTER performs its various searches, records with negative numbers in their primary or secondary keys may not be found when and where you expect them. In general, they can be found by a direct search for a specific record, but not by range or relational searches (see Finding & Displaying Records). Negative numbers used in non-key fields will cause problems only if you wish to print a report sorted on the contents of the field (because the program builds a temporary file using the sort fields as a key). Otherwise they will work as expected.

4.   Computed: Computed Fields can add, subtract, multiply or divide the contents of any 2 numeric (or dollar/cents) fields; or a numeric field and a constant; or another computed field in combination with another numeric/computed field or constant.

Computed fields are all floating point numbers and require five bytes of storage space. The maximum field length for a computed field is 11 characters.

Computed fields CANNOT be used in your primary key, and will NOT appear as an option in the Dynamic Prompting until your key has been created. When you choose Field Type #2 (Numeric) computed fields will appear as option #4.

You may have up to 10 computed fields in each record. After that any attempts to create additional computed fields will be treated as if you were requesting a #3 Numeric.   The field will be created as a Floating Point number. All of the computed fields in a record are re-computed each time that record is edited. Any time one operand changes, the new result will be put into the computed field. These calculations will cause a slight delay each time you finish an edit. The more computed fields in the record, the greater the delay.

In more complex calculations, you may include any computed field as an operand in any other computed field BUT NOT IN ITSELF!.

Calculations are done in order. A computed field using an EARLIER computed field as an operand (i.e., one which comes BEFORE it in the record) will be figured based on the NEW data (since it will already have been calculated). When an operand comes LATER in the record, the computed field based upon it will have been calculated BEFORE that operand is changed. This could be advantagious in applications requiring cumulative balances or totals.

Unlike the computed fields in the report generator, these fields are actually stored within the records. When a record is displayed on the screen, the computed field will look like any other field, and it will always contain the proper calculated result. In the Add Records or Editing Mode, the cursor will SKIP OVER the computed fields, since the contents of those fields will be filled in automatically.

When designing your reports, you may sort or select based upon computed fields. You may use computed fields within your record as operands in a report's computed fields or total them, etc.

Computed fields are useful for special report applications as the following examples demonstrate.

To sort and print a report in DESCENDING order, rather than ascending order (based on the contents of a particular field) create the file with a computed field which is equal to (999,999,999) - (X), where X is the field you wish to use for the descending sort. Then sort on the computed value. The end result will be a descending sort on the desired field.

If your file is designed to handle inventory control (with fields for Quantity On Hand and Re-Order Level), create a computed field which is equal to (Quantity On Hand) - (Re-Order Level). By selecting those records where the computed field is less than or equal to zero, you can print a "re-order report" that only includes the items which need to be ordered. The same information could be used to search for those records in the Display mode.

ENTERING COMPUTED FIELD FORMULAS

The formulas for your computed fields are entered after all of the pages of your new file format have been finished. This allows you to have computed fields on page one which are based on values on pages three and five.

After your last page is finished and edited a list of the fields in your new file will be displayed. You can now enter the formulas for your computations.

The name of the field you are setting up will appear on the list in inverse video. Enter the field numbers (or "0" to use a constant), the sign for the operation you wish to use ("+, -, * or /"), and, if required, a constant. The program will then go on to the next computed field, until they have all been set up.

THE STORAGE REQUIREMENT FOR ALL OF THE REMAINING FIELD
TYPES WILL BE EQUAL TO THE FIELD LENGTH IN CHARACTERS.

C. Alphanumeric fields are non-formatted fields of 1 to
30 characters in length. Alphanumeric means letters
(alpha characters) or numbers. (The Dynamic Prompting
when you are creating a file abbreviates alphanumeric as
"ALPHA.") These fields will accept any character on the
Apple's keyboard, except that certain characters (<,>,=,
(,),?,*, and ^) cannot be entered as the first
character in the field. (The reason for this limitation
will become obvious later on).

If you need more than the 30 character length allowed
for alphanumeric fields, (for comments, descriptions,
etc.), set up two or more fields on adjacent lines.

Since you must give each of the fields a name, you can
either spread the name over several fields or number
the additional lines. Examples:

DESCRIPTION _____
OF MAJOR _____
PRODUCTS _____

or:

COMMENTS 1:_____
         2:_____
         3:_____

When you go to enter your data, simply press RETURN at
the end of each line, then enter the next line. When you
print a report, you may print the lines separately or
combine them.

Don't hesitate to make an Alpha-numeric field as long
as you need. D B MASTER will "pack" any unused spaces
so that ten empty spaces will take up no more storage
room than would two empty spaces.

(In technical terms: the system will automatically
store 3 to 255 consecutive recurrences of any single
character in just two or three bytes. This includes
recurrences that cross multiple field boundaries, so
that a number of consecutive empty fields will be

packed into just 2 bytes on the disk. Recurrences of more than 255 characters require 3 or 4 bytes of storage.)

This also means that, unless you have a particularly large record (over 300 bytes or more than 30 fields), you should not hesitate to include a field (such as "COUNTRY" or a second address line) which may only have entries for a small percentage of your records. The net effect on your storage capacity will be minimal.

Alphanumeric, rather than numeric fields are recommended for use as zip code fields. (See "A Note About Zip Codes", below.)

D. The Yes/No field type is a one character (one byte) field that will only accept a "Y" or an "N" input. When your form is displayed, the name which you have given the field will be displayed, followed by the prompt "(Y/N)" to remind you of the field type.

Default Values

All of the above field types may be assigned default (standard or most common) values when you create your file. When new records are added to your file, the default value for a field may be accepted by pressing RETURN, or a different value may be entered by simply typing it in.

SOCIAL SECURITY NUMBER, TELEPHONE NUMBER, and DATE fields are all pre-formatted fields. That is, the spaces and dashes are already set up for your convenience, and data can only be entered in the proper format. They will accept only the numerals 0 thru 9. In addition, these fields cannot be left incomplete. They may be left empty, but otherwise all character positions must be filled before D B MASTER will allow you to go on to the next field.

The computer will automatically skip over the dashes for you, both when entering data and when back spacing (left arrow).

E.Social Security Number fieldsare formatted like
this: ___-__-____ , and require 11 bytes of space.

F. Telephone Number fields look like this:
___-___-____ . They may be assigned a default value for
Area Code (a great convenience when most of your
clients, etc. are in one area). They require 12 bytes
of storage space.

G. A Date field (__-__-__) requires 8 bytes of disk
storage space. Dates are not checked for valid inputs,
since you may want to use a date field for other
purposes. Also, you may want to enter your dates as
YY-MM-DD or as MM-DD-YY, depending on the types of
searches you will be doing on your date fields.

If many of the phone numbers that you need to store
will have extension numbers, you may find it useful to
follow a phone number field, on the same line, with an
appropriate four or five character alphanumeric or large
integer field called "EXT".

H. D B MASTER also has a provision for an "Auto Date"
field. The current date is automatically inserted into
Auto Date fields when you first add each record to the
file. It is then replaced with a new current date each
time that you edit that record. If your file includes
an Auto Date field, you can always tell the last time
that the information in each record was changed.

The user has no way to enter or edit the data in an
Auto Date field, other than by actually editing the
contents of the record (thereby putting the new current
date into the Auto Date field). Note that it is
possible to do this without actually changing the
contents of the record, since you can "replace" the
contents of a field with its original contents. It is
also possible to use a "fictitious" current date.

It is recommended that you include one Auto Date field
in each D B MASTER file that you create. These fields
are particularly useful in that they can be used to
print lists of all records that have been added or
edited on a certain day or within a range of dates. See
Printing a Daily Update List.

NOTE: Auto Date fields will be slightly more convenient if they are created as the first or last field on a form "page."

Auto Date fields may not be included in a file's primary key. The reason for this is that the system would then have to change its primary and secondary keys every time a record was edited, a process which would significantly degrade the operation of the program. Also, there would be no way to keep the primary key from changing, even when you were editing non-key fields.

NOTE: Social Security, Telephone Number and (regular) Date fields may also be used for other purposes that require only numerals, use the appropriate field length and formatting, and would never need to be left partially completed. (E.G. stock, part or client numbers.)

6. A Note About Zip Codes

Since D B MASTER stores numeric fields in binary form, rather than as alphanumeric characters, the program will never print leading zeros in a numeric field. Therefore, if you use a numeric field for zip codes, you will have a problem with those parts of the country which have one or more leading zeros in their codes. In addition, other countries frequently use letters as well as numbers in their equivalent of our zip codes. Thus we suggest that you use alphanumeric fields for zip codes in your D B MASTER files.

Now, back to our tutorial....

7. Tutorial – Part 2 – Creating a File

You are now ready to create your first file. We have
chosen a mailing list for our example because it is one
of the most universal applications for a data base
system. However, in order to properly demonstrate the
power and flexibility of D B MASTER, we've thrown in a
few extra fields.

Imagine that you want to keep a mailing list for your
business. Perhaps it's a list of clients or suppliers,
or maybe just a list of customers. You would probably
want to store a bit more than just name, address and
phone number. And that's what we will do. (We have
stretched things a bit in order to demonstrate most of
D B MASTER'S field types in one example. Please bear
with us if some of the fields that we've chosen seem a
bit strange.)

On the next page of this manual you will find a sample
Form Layout Sheet for the first page of the file that
you will be building. You may want to remove it
temporarily and use it as you create the file.

If you've been following the tutorial so far, you
should now have the main "form building" display on
your monitor. The flashing cursor should be at the input
for "Field Type." Note the list of field types and
their numbers on the third line from the bottom of the
screen. Our first field ("LAST NAME") is alphanumeric,
so enter a "1" for field type and press RETURN.

The cursor should now be at the input for Name. This is
where you enter the name for this field, so type in
"LAST NAME," and press RETURN.

Now the program will ask for the location and length of
the field. Enter "4" for the "VERT" location. Since we
want a "1" for the "HORIZ" location, you may simply
press RETURN again, and the default value of "1" will be
entered automatically. Finally, enter ´20´ for the
length. Note that until you press RETURN after the last
field, you may go back to any of the fields by pressing
the ESCape key, re-enter the information for that
field, then press RETURN as many times as necessary to
get to the end of the form.

NOTE: The top line of the screen (line 1) and the bottom two lines (23 & 24) may not be used by your forms. Those lines are reserved for D B MASTER's Dynamic Prompting.

The program will now ask for a "default" value for "LAST NAME." Since you aren't likely to have a lot of entries with the same last name, just press RETURN and there will be no default for this field.

You should now see the "Last Name" field displayed in its proper position on the screen, along with a series of underline characters which show the field length. The two periods ("..") between the field name and the underlines are inserted here by the program because they will be needed when you ask D B MASTER to find and display records, and we don't want your fields to overlap. Note that the Form Layout Sheet includes information on the number of extra spaces to allow for each field type when you are designing your forms.

Next tell the system that you do want to add another field to the key, (enter "Y") and set up the second field (FIRST NAME), using the information on the sample layout as a guide.

Once again ask for another key field, but this time enter a "2" for field type, and the name "CUSTOMER NUMBER." Now you will have to determine which numeric type you want. (Refer back to "Field Types" for a complete description of the differences between the numeric types.) We're using a small company for an example, so let's assume that you won't have more than a few thousand customer numbers. Enter a "2" for the "Large Integer" number type (+/- 32,767).

Finish entering the CUSTOMER NUMBER field (set the field length to 5), then tell D B MASTER that you do NOT want to add another field to the primary key. Your primary key for this file will now be LAST NAME + FIRST NAME + CUSTOMER NUMBER, so even if you have more than one customer with the same name, you will not have a problem keeping each record's primary key unique.

NOTE: ALL PRIMARY KEY FIELDS SHOULD BE ON THE FIRST "PAGE" OF YOUR FORM! Otherwise you will have to go to more than one page to set up a primary key search.

D B MASTER SCREEN FORM LAYOUT SHEET

```
      1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
 1
 2
 3
 4  L A S T   N A M E — L = 2 0 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
 5
 6  F I R S T   N A M E — L = 1 0 _ _ _ _ _ _ _ _
 7
 8  C U S T O M E R   N U M B E R — L = 5 _ _ _
 9
10            P H O N E   # _ _ _ _ _ _ — _ _ _ — _ _ _ _
11
12            B I R T H D A Y _ _ _ _ — _ _ — _ _
13
14                  A G E — L = 2 _
15
16
17
18
19
20
21
22
23
24
```

FILE NAME *TUTORIAL*_____ PAGE # *1*_____

EACH FIELD HAS 2 LENGTHS ASSOCIATED WITH IT: 1. # OF CHARACTERS IN FIELD
2. MAX. # OF SPACES IT CAN OCCUPY ON SCREEN, INCLUDING $, —, (Y/N), ETC.

USE 2ND (GREATER) LENGTH IN DESIGNING YOUR FORM ABOVE. NOTE 1ST (SHORTER)
FIGURE AT EACH FIELD TO REMIND YOU OF LENGTH TO ENTER INTO COMPUTER.

TO DETERMINE 2ND LENGTH, USE THE FOLLOWING RULES:

FIELD TYPE	# TO ADD TO 1ST LEN.	MINIMUM 2ND LENGTH	MAXIMUM 2ND LENGTH
ALPHANUMERIC	3	4	33
0 - 255	3	4	6
+ / — 32767	3	4	9
FLOATING POINT	3	4	11
DOLLAR / CENTS	4	8	15
YES / NO		2ND LENGTH = 9	
SOCIAL SECURITY		2ND LENGTH = 14	
TELEPHONE NUMBER		2ND LENGTH = 15	
DATE & AUTO DATE		2ND LENGTH = 11	

DO NOT USE LINES 1, 23 OR 24. DO NOT GO BEYOND CHARACTER POSITION #39.

YOU CREATE A FILE BY DESIGNING ITS FORM.
Place the fields you want wherever you want them on your screen:

USE THESE SCALES TO CHOOSE
THE HORIZONTAL AND VERTICAL
POSITIONS FOR YOUR FIELDS.

YOUR FIELDS WILL APPEAR ON
THE SCREEN AS YOU ADD THEM
TO THE FORM.

FILL IN THE BLANKS HERE TO
BUILD YOUR FORM.

DYNAMIC PROMPTING (TM) PUTS
THE INFORMATION YOU NEED ON
YOUR SCREEN.

KEY OR RECORD LENGTH:
MAX. KEY = 35 BYTES
MAX. RECORD = 1020 BYTES

HOW TO MOVE ON TO THE
NEXT STEP.

LIST OF FIELD TYPES.

CURRENT FORM "PAGE" NUMBER.

```
1234567890123456789012345678901234567 89
2
3
4
5
NAME .._____
7
ADDRESS .._____
9
10
11
12
13
14
15
16
17
18
19
20
21
1ALPHA 2NUMERIC 3$ 4Y/N 5SS# 6TEL 7DATES
FIELD TYPE 3   NAME CITY
KEY LENGTH = 22 =>CTRL/S IF DONE <= P.1
```

Next enter the "PHONE #" field. Note that the field
type is 6, and that you do not have to specify a length
for fixed length fields. This time enter a "9" for the
HORIZ location. (See how the default disappears when
you enter another value?) Now when the system asks for
a Default Area Code, enter your local area code number.
That way when you are adding new records you will never
have to type in the area code for local phone numbers.

The "BIRTHDATE" field is a date field (type "7"). It is
not an "Auto Date" field, so answer no ("N") to the
question "AUTO? (Y/N)."

Finally, enter the "AGE" field information. The Field
Type is "2", Numeric Type "1" (for Small Integer -
unless you have friends older than 255!), and the
HORIZ. position is 14. Set the field length to "2."

Now enter a "CTRL/S" to tell the program that you would
like to stop entering fields. (Remember that the CTRL
key works like a shift key - press it first and hold it
down along with the "S" key.)

You are now in the field editing mode. A number will
appear after each field name on the form, and you may
now re-enter any of the fields by simply specifying its
number. If you edit a field, it will disappear from the
form, and you may then re-create it, changing field
type, name, position, etc. Feel free to try a few edits
now. You might, for instance, reposition some of the
fields to change the appearance of your form. Note that
you may re-enter the same field more than once if
necessary.

The one limitation to this edit mode is that you may
not change the NUMBER of fields on the page. That is,
you may not add or delete fields - only change them.

The program will not let you enter a field that
overlaps another field or that goes beyond the 39th
horizontal character position. Likewise, you cannot use
the top line (VERT = 1) or the bottom two lines (VERT =
23 or 24) of the screen. The 22nd line may be used, but
you will then loose the display with the field types
and their numbers. Alphanumeric fields must be 1 to 30
characters in length. Numeric and Dollar/Cents fields
will automatically be shortened to the maximum legal

length for their field type if you enter anything longer. (We try to make it as hard as possible to make mistakes!) Also, if you enter a length of less than 4 for a Dollar field, it will be set to 4.

If you enter an "illegal" field type, length, position, etc., or leave one of the inputs blank, the program will "beep" at you and ask you to re-enter the last set of responses.

When you are finished editing the fields on this page, enter a "0" for "ENTER ITEM # TO EDIT," and the program will move on to the next step. Note that the instruction to enter a "0" when you are done editing is printed on the bottom of the screen.

We'll come back to our tutorial in a moment. But first, please read about Secondary Keys and Read Protected Fields....

8. Secondary Keys

D B MASTER will quickly find any record in a file if you know at least the beginning of the primary key for that record. It will also search for the contents of other (none-key) fields, but that process can be time consuming, particularly if you have a very large file.

But what if you also need a rapid search capability on other fields? For instance, you might have a file of suppliers, indexed by their name or supplier number (ie, supplier name or number is the first primary key field). But you also want to be able to find a supplier in a particular city as quickly as possible. Or perhaps your primary key is SUPPLIER NAME + SUPPLIER NUMBER, but you also want to be able to call up records by entering the supplier number, without entering the name.

D B MASTER lets you do this by creating Secondary Keys. The rules for secondary keys are as follows:

1. **SECONDARY KEYS HAVE ONE AND ONLY ONE PURPOSE:** the rapid retrieval **FOR SCREEN DISPLAY** and **EDITING** of records by other than the first primary key field.

2. Secondary Keys should be used sparingly. Large numbers of secondary keys will slow the operation of the system and limit maximum file size. With one disk drive

or a very large file (more than three or four diskettes of data), secondary keys can result in the need for frequent "disk swapping." Although D B MASTER does not limit the number of secondary keys, we do not recommend using more than two or three per file.

3. Secondary Keys should NOT be created unless a field will be used frequently for record retrieval.

4. If possible, secondary keys should NOT be created on fields whose contents will change frequently.

5. Secondary Keys may be created when a file is first set up. They may also be created or eliminated by entering the "File Maintenance" module from D B MASTER'S Main Menu. When you create a file, the request for secondary key field numbers will come after each form "page" has been completed and edited. IF YOU ENTER THE WRONG FIELD NUMBER, YOU MAY CORRECT YOUR MISTAKE BY ENTERING THE SAME NUMBER A SECOND TIME.

6. Secondary Keys will cause a brief delay every time a new record is entered, or if a primary or secondary key field of an existing record is changed. IF YOU ARE GOING TO ENTER A LARGE NUMBER OF RECORDS INTO A NEW FILE, IT IS STRONGLY RECOMMENDED THAT YOU DO NOT CREATE YOUR SECONDARY KEYS UNTIL AFTER YOU HAVE ENTERED ALL OF YOUR STARTING DATA. This will make your original data entry process considerably faster.

7. Secondary Keys do not have to be unique. That is, many records may have the same contents in the same secondary key field. (E.G. you might have more that one supplier in the same city.) If you ask for records by a secondary key which is not unique, the system will find all of the records that match that value and display them for you in primary key order.

8. Secondary Key fields are indicated on form displays by a quote sign (") following the field name. If a secondary key field is also part of the primary key, the (") sign will be displayed instead of the (!) sign.

9. Secondary Keys have a maximum length of 10 bytes. In a longer field, only the first 10 characters will count. Thus Palm Beach Gardens and Palm Beach Shores would both be found, regardless of which you asked for, or even if you just asked for Palm Beach.

9. Read Protected Fields

Under some circumstances you may want parts of your file to be inaccessible to certain users of the program. D B MASTER allows you to "hide" such information from low-level (READ ONLY) password users by creating "Read Protected Fields".

Read Protected Fields must be so designated when the file is created. After each "page" of your new form is completed and edited, you will be asked to assign secondary key fields, and then (assuming that you have requested passwords for that file) to add read protected fields.

READ PROTECTED FIELDS CANNOT BE ASSIGNED OR CHANGED LATER, ALTHOUGH PASSWORDS MAY!

The Create module will indicate a read protected field by "whiting out" the field's data area with inverse video. In actual use, however, the field would simply "not be there" to a read-only user.

Read protected status may be assigned to any field type. Remember, however, that read only users will not be able to search for records using the contents of a read protected field as one of their search criteria.

If you have entered the wrong field number for read protect status, you may restore the field to normal status by entering its number a second time.

10. File Size Limitations

The number of records that D B MASTER will hold in one file depends upon four factors:

(1) Primary key length
(2) Combined length of all field names
(3) Record length
(4) Number of secondary keys

If you are going to build a large file (I.E., one with more than a thousand records), keep each of these parameters as small as possible!

(See"Maximum Number of Records Per File")

11. Tutorial - Part 3 - Creating a File (cont'd.)

CUSTOMER NUMBER is a logical choice for a secondary key in your file. That way if you only know his or her number, you can still find a customer's record in about five seconds (assuming that no disk swapping is required). So enter a "3" for a secondary key field. Note that a quote (") sign appears after the field name to show you that that is a secondary key field. Then enter a "0" to move on.

There are no logical fields to read protect on this page, so let's wait for the next page to try that feature. Incidentally, both the secondary key and the read protect set-up procedures include a "toggle" function. That means that the first time you enter a field number, it will turn the function on, and entering the same number a second time will switch ("toggle") it off again. So any mistakes that you make can be easily corrected as long as you catch them before moving on to the next section of the program.

Enter another "0" to say that you do not want any read protected fields on this page. Then, since this is to be a two-page form (D B MASTER will allow up to 9 pages in a form!) say that you do want to add another page to your form, and let's move on!

The first field on this page will be an Auto Date field. AUTO DATE FIELDS SHOULD ALWAYS BE THE FIRST OR LAST FIELD ON A PAGE. Otherwise it can be confusing to have the cursor skipping over a field in the middle of the page when you are adding or editing records.

WE RECOMMEND THAT ALL FILES CONTAIN ONE AUTO DATE FIELD!

Enter a "7" for field type, then the name "AUTO DATE." Next position the field anywhere you like near the top of the page (there are six more fields to go on this page), and enter a "Y" in response to "AUTO?" to make this an Auto Date field.

Next set up fields for "ADDRESS" and "CITY." Each should be a 25 character alphanumeric field. "STATE" comes next, and it, too is alphanumeric, but it only needs to be two characters in length. You might also

enter your own state's two letter abbreviation as a default for STATE. And since STATE is such a short field, why not put "ZIP CODE" on the same line? ZIP CODE should be an alphanumeric field (field type = 1) and its length depends on what the post office has done since this manual was printed! Remember that numeric fields don't print leading zeros, so they do not work well for zip codes.

Now set up a Dollar/Cents field called "AMOUNT DUE" or "MONTHLY PAYMENT" or anything else that will make sense as a Dollar/Cents field (no pun intended!) in your extended mailing list file. Dollar fields are type 3, and remember to include the decimal point and the two digits to the right of it when you decide on the field length. When the program asks for a default value, you can see how D B MASTER's Dollar fields work. Try entering a dollar amount, using the back space key (left arrow), etc. You may either leave a default value in the field (if one would make sense in your file), or clear it by back-spacing until the field is empty again before pressing RETURN.

Finally, let's take care of the Season's Greetings card problem by adding a field called "SEND NEW YEARS CARD?" as a Yes/No field (type "4"). You may also enter a default for this field if you like.

You will note that you have now used every field type except the Social Security Number type, which operates just like a regular date field.

Enter a CTRL/S to stop entering fields, then edit the page as necessary.

Don't request any more secondary keys now - you can always build more of them later if you need them. But you might try Read Protecting the Auto Date field, or perhaps your Dollar/Cents field. Remember that you can turn the secondary key or read protection back off by entering a field number for the second time. (That is important to remember, since it's one of the options that we didn't have room to mention in the Dynamic Prompting.)

When you are done, tell the program that you do not want another page, and give your new file a name. You will then be shown the pages of your new form, and given a chance to start over from scratch if necessary.

If you are satisfied with the file, simply press RETURN and then insert blank disks (you will need two of them) when D B MASTER requests them. (Be sure to put them in the correct disk drives – the program will tell you which to use!)

IMPORTANT: You should now label your diskettes. Labels should include the file name, the word "MASTER" or "UTILITY," (the program will tell you which diskette it is creating when it requests the blank disk), and the diskette volume number, which in this case will be "1" for both of the disks. Later, when you have created several files, it will be important to have all of your diskettes labeled to avoid costly mistakes. (D B MASTER does use a code on each diskette to help it to "know" when the wrong diskette has been inserted, but if you have given two files the same name it may cause problems.)

You have now finished creating your first D B MASTER file! The program will take you to the Main Menu, and in a few moments you can begin entering your first records.

NOTE: Before you can make use of any of D B MASTER´s print routines, you must set up your printer parameters. Therefore, we suggest that each time you build a file, you immediately go into the File Maintenance module and enter your printer information. If you wish to do this now, please turn to "Entering Printer Parameters."

12. Master, Utility & Sort File Disks

You may be wondering why D B MASTER needs two blank disks to set up a new file. Actually, the program will use as many as three disks (or three sets of disks if the file is large!) for each file:

1. The "Master" or data disks. These are the disks that hold the actual records that you enter into a file. A small file will have only one data disk, while larger files might have as many as ten or twenty. Each of these diskettes is called a "VOLUME." When the program asks for a master data disk, it will ask for it by the name which you assigned to the file, plus a volume number which is assigned by the program.

2. The Utility disks. These are the disks that hold the secondary key files, form and report formats, printer control information, etc. that the system needs to function. Small to medium size files will generally have a one volume utility disk, unless they have a lot of secondary keys.

3. Sort File disks are only created if you ask the program to print a report that is sorted in an order other than primary key order. In that case the program will build a temporary file sorted in the proper order, then print the report from that file.

D B MASTER will prompt you to insert disks when it needs them, and tell you which disk drive it wants them in. The prompt will include a diskette name and volume number, and a date in the form "103180". The date will be the date when the file was created, or the last time it was reblocked (see File Maintenance). The name will be your file name (for a master diskette), the word "Utility"plus thefirst 8 letters of the file name (for a utility file),or "Sort" (fora report sort file.)

When the program requires a new (blank) diskette, it will ask for "NEW UTILITY", "NEW SORT" or "NEW (your file name)", the volume number of the new diskette (usually 1), and the current date. New diskettes will always be INIT'd by the program - they need not be prepared in advance. You should always prepare a label for a new diskette including this information, and label the diskette before you insert it.

Do not write protect your data diskettes! If you do, D B MASTER will not be able to open your file. In that case it will simply repeat the prompt to insert the diskette that it is looking for.

The only time when a utility file will "split" and overflow onto a second diskette is when you have a large file with a lot of secondary keys. Once that happens, the system will become very awkward to use, since you will have to swap the utility diskettes almost every time you add a record, and frequently when editing records or performing secondary key searches. If your utility file splits, we recommend that you delete your least-used secondary key, then re-block your file. That will usually restore the utility file to a single volume.

It is possible to find out a diskette's file name, date and other information without using D B MASTER. To do so, "boot" a normal DOS 3.3 diskette, and CATALOG the data disk. A flashing display will tell you the name of the diskette (your file name, Utility plus the first part of the file name, or Sort), the volume number of the diskette, and the date the file was created or reblocked. In addition, you will see two numbers followed by the letters "K" and "DB". The first is the amount of data stored on that diskette (1 "K" = 1024 bytes), and the second is the number of data blocks currently in use on that disk. Each data block holds a maximum of 2 K of data.

Note that there are actually two volume numbers in the catalog information. A standard DOS catalog number appears above the other information, in standard video. This is a random number used by the program - it is not needed by the user. The important volume number appears with the other information in flashing video. This number will usually be a 1, unless you are using a multi-volume file.

CHAPTER 2 - ADDING RECORDS TO A FILE

1. Entering Records

Before you can add records to a file, that file must first be "opened". When you boot your D B MASTER program disk, you are given a choice of creating a new file (by pressing "ESC") or opening an existing file by inserting the file's utility disk (volume #1) into the proper disk drive. The Main Menu will then display the name of the current file. To open a different file, enter a "7" from the Main Menu ("Load or Create New File").

To add records to the current file, enter a "2" from the Main Menu ("Add Records"). If the file already has records in it, the first page of the last record entered will be displayed, along with the date of entry (unless that record has been deleted). This will help you determine where you stopped entering during your last session. To begin entering new records, press RETURN. (If there are no records in the file, or if the last record entered has been deleted or had its primary key changed, a blank record containing only the default values will be displayed.)

Records are added to a file by filling in a form. To accept the default value for a field, simply press return. To enter a different value, or if there is no default, type in the proper information.

If there is a default value for a telephone number, pressing RETURN will skip directly to the first empty position in the field. To leave the field empty, press RETURN again, and the default will disappear. Otherwise, type in the rest of the number.

Telephone number, social security number and date fields must be left empty or completely filled in. If you try to leave one of these fields incomplete by pressing RETURN or ESCape, the program will beep at you and the cursor will not move. You may, however, back space until the field is empty, then leave the field.

At any time when the cursor is on one of the fields in a form, you may press the ESCape key to back up to a previous field. You may then enter or re-enter data

into that field, then press RETURN to move back down the form. Contents of lower fields will then be treated as default values: that is, if no new characters are entered, the value on the screen will be left in the field. If any characters are typed, the field will be emptied and the new characters displayed.

The one exception to this, as mentioned above, is that you cannot press ESCape to leave an incomplete phone number, date or social security number field.

NOTE: It is not necessary to memorize the control functions that follow, since they will be listed on the bottom of the screen when they are available. Also, remember that the control (CTRL) key works like a shift key.

Entering a CTRL/C while entering a new record will void that entry and return you to the Main Menu.

Entering a CTRL/N while entering a record will take you to the next page of the form. If you are already on the last page of the form, the cursor will move to the bottom of the screen and a new Dynamic Prompting display will appear. This will have the same effect as pressing RETURN after entering the last field in the record.

Entering a CTRL/A (for Add) will add the current record to the file without the user having to go through the additional fields or pages of the form.

If you enter a CTRL/I (for Increment) when the cursor is at the first position of a numeric or dollar/cents field, the value in that field will be incremented (increased) by one. You may enter several CTRL/I's to add 2, 3 or 4, etc. to a field's value. The program will ring a "bell" if adding to the field would take it beyond its legal range or length. See below for hints on using Increment in the Last Record Default Mode.

Once you have finished entering a record, you may store it and set up to add the next record by pressing RETURN. There may be a delay of several seconds here, and perhaps one or more disk accesses, particularly if you have one or more secondary keys in your file. (See below for an explanation of how D B MASTER stores its data.)

You may also enter a CTRL/V at this point to void your
entry and start over, or press ESC to make changes in
the entry before you store it. Note that we have tried
to give you as many opportunities as possible to edit or
void your entry before it is actually entered into the
file.

If you try to add a record with a primary key that
already exists in your file, the program will not accept
it. An error message will appear on the screen, and you
may then enter a record with a different primary key.

2. How D B MASTER Stores Records

When you are entering records, you will notice that
after adding some records no disk access is required,
and at other times one or both of your drives may come
on (assuming that your have two disk drives) or you may
be required to swap diskettes (if you have only a
single disk drive). The following explanation should
help you to understand what is happening at these
times, and to make your data entry as efficient as
possible.

Note that it is not necessary to read or understand
this section in order to use D B MASTER, since all of
the data storage and maintenance are handled
automatically. Also, the description of our ISAM
file-handling system that follows has been greatly
simplified for the sake of brevity.

D B MASTER stores its records in DATA BLOCKS. Each data
block holds a number of records (depending on the
record size). Normally there is one master file data
block and one utility file data block in the computer's
RAM memory. Records are stored in primary key order
within a data block, and each data block holds a
specific segment of the file.

For instance, if your first primary key field is
alphanumeric, and if your records fill two data blocks
(a very small file!), the first block might hold all of
the records whose keys begin with the letters A thru O.
The second data block would hold those records
beginning with P through Z.

Continuing with the same example, if you now add a new
record, the program must insert it into the proper data

TO ADD RECORDS, SIMPLY FILL IN THE FORM:

PRESS RETURN TO GO TO THE
NEXT FIELD. PRESS THE ESCAPE
KEY TO BACK UP.

THESE FIELDS HAVE "DEFAULT"
VALUES FOR COMMONLY
ENTERED INFORMATION. PRESS
RETURN TO ACCEPT THE DEFAULT,
OR TYPE IN DIFFERENT
INFORMATION.

TELEPHONE NUMBER, DATE AND
SOCIAL SECURITY NUMBER FIELDS
ARE PRE-FORMATTED FOR YOUR
CONVENIENCE.

PHONE NUMBER FIELDS MAY
HAVE DEFAULT AREA CODES.

```
P.1 OF 2                    # OF RECORDS = 226


NAME  _____
ADDRESS  _____
CITY SAN FRANCISCO
STATE CA
    PHONE # 415-___-____
    BIRTHDATE __-__-__



    CTRL: /N=>NEXT PAGE, /I=>INCREMENT
    /C=>MENU, /A=>ADD THIS RECORD
```

"DYNAMIC PROMPTING"

ADD 1 TO THE VALUE
IN A NUMERIC FIELD.

block. If that block is not in the computer, it will have to be loaded. But first the block that IS in RAM will have to be put back on the disk (unless no changes have been made in it).

A similar procedure is followed when a block is filled. In that case a new block is created which will hold any records that come between the two original blocks. This obviously leads to blocks of varying lengths, so it is advisable to periodically "re-block" your files. Re-blocking rebuilds your file with the optimum size data block. It is done through the "File Maintenance" option of the main menu, and is the ideal way to create "back-up" copies of your files. (Use the re-blocked file as your work disk and save the original as a back-up. That way you also rotate your disks for longer life.)

When you have a secondary key, a small record is created in the utility file corresponding to each and every record in the master file. Each additional secondary key field that you specify requires an additional set of these secondary key records.

Secondary keys consist of the secondary key field contents of a record, plus the primary key of that record. (If the secondary key field is longer than 10 bytes, only the first ten characters are used.) When you search by a secondary key field, D B MASTER first finds a match in its secondary key file, then uses the primary key portion of the secondary key to retrieve the complete record from the master file. This is why a secondary key search takes about twice as long as a primary key search (about five seconds).

When you add a new record to your file, the system first builds the master record, then it must build a secondary key record for each secondary key field. This is what causes the delay when adding records.

Whenever you change the contents of a record's primary key, the system has to delete the original record, then write the changed record into the proper data block. Then it must do the same to any secondary keys, since each secondary key also contains that record's primary key.

Similarly, when a secondary key field is edited, the program must delete and re-write the corresponding secondary keyrecord.Thus we recommend not creating secondary keys on fields which will change frequently.

D B MASTER DOES NOT WRITE A DATA BLOCK TO THE DISK UNTIL IT NEEDS TO LOAD A DIFFERENT BLOCK. IF YOU EXIT THE PROGRAM WITHOUT GOING THROUGH "CLOSE FILES & EXIT" (Main Menu option #8), YOU MAY LOSE ANY CHANGES OR ADDITIONS THAT HAVE JUST BEEN MADE TO THE DATA BLOCK IN THE COMPUTER. The data block will still be on the disk in the form that it was in when last loaded. IN SOME CASES THIS MAY DESTROY A FILE. **"CLOSE FILES & EXIT" ONLY TAKES ABOUT FIVE SECONDS. USE IT!!** And back up your files frequently, in case you have a power failure or other disaster.

3. Speeding Data Entry

HERE ARE FOUR TRICKS THAT CAN SPEED ENTRY OF NEW DATA:

1. If you are entering a number of new records, try to enter them in primary key order – that is, in alphabetic or numeric order based on the first field(s) in the record.

2. If you are going to create a new file and immediately enter a lot of records into the file, do not create secondary key fields until after you have entered all of your records. You may then create whatever secondary keys you need through the File Maintenance module.

(Both of these procedures are doubly important if you have only one disk drive.)

3.To number your records sequentially, enter them using the Last Record Default Mode (see below), and use the CTRL/I fuction to Increment the value in your numbering field by one for each new record.

4. If you only wish to enter data into a few of your fields as you add new records (with other information to be filled in later), create a "short form" to use in entering your records. See Short Forms, below.

4. Changing Defaults & The Last Record Default Mode

The original default values which you establish when you create a file cannot be changed. However D B MASTER includes two ways of temporarily changing your defaults.

When you enter a "2" from the Main Menu to begin adding records, the last record entered is displayed on your screen. At that point the Dynamic Prompting will give your three options: press RETURN to begin adding records, enter CTRL/C to return to the menu, or press ESCape to change defaults.

If you press the ESCape key at that point, the program will ask "LAST RECORD DEFAULT MODE? (Y/N)." If you answer "N", your form will appear on the screen, and you may fill in a new set of temporary defaults. When you have finished, the program will go into the Add Records mode. (Note that the same rules apply for these temporary defaults as for your original set: no defaults for Social Security Numbers or Dates, but you may enterdefault area codes for Phone Numbers, etc.)

If you answer "Y" to the question, the program will enter the Last Record Default Mode. The next record that you add will be entered normally, but any ADDITIONAL RECORDS THAT YOU ADD BEFORE RETURNING TO THE MAIN MENU WILL USE ALL OF THE VALUES ENTERED FOR THE PREVIOUS RECORD AS DEFAULTS. In this mode ALL FIELD TYPES ARE INCLUDED, including dates, social security numbers, and complete telephone numbers.

There are three main reasons for using the Last Record Default Mode:

1. If you are entering records in groups with similar information, you need only re-type the information which CHANGES from one record to the next. For example, you might add several records containing the same city and state, then several from another city, and so on. You would only have to type city and state when they changed. The one thing to watch out for in this mode is that you may have a default value from the previous record in a field where you want no information at all in the next record. In that case, press the SPACE BAR at the beginning of the field, and the default contents will disappear, leaving the field empty.

2. The Last Record Default Mode is also a handy way to confirm the data which was entered into the previous record. If you find an error you can make a note to call up the record later and edit it.

3. Finally, if you wish to number your records sequentially, you can use the CTRL/I (Increment) function to add 1 to the record number of the previous record as you add each new record.

If you wish to restore your original default values, you must re-enter your file. To do so, enter a "7" from the Main Menu ("Load or Create New File"), say that you do not wish to create a new file, and follow the directions on your screen.

5. Tutorial – Part 4 – Adding Records

Let's begin entering records into your file. Enter a "2" from the Main Menu to get started. Depending on the number of disk drives you are using, you may be prompted to insert your file's master diskette.

You will now see the first page of the form that you created, including any default values, displayed on your screen. If there were already records in this file, the first page of the last record added to the file, and the date when it was added, would be displayed here. Press RETURN to get started.

Begin entering records. Remember the rules for form input discussed earlier:

*** Press return to go to the next field, and

*** Press the ESCape key to back up to a previous field.

Note the Dynamic Prompting at the bottom of the screen. These prompts will tell you how to move to the next page of the form, add the next record, void an entry, return to the menu, etc.

If you enter a CTRL/C, you will return to the Main Menu (Clear & Return to Menu), and the record you were entering WILL NOT be entered into the file.

You may enter a CTRL/N to go to the next page at any time EXCEPT when the cursor is in an incomplete telephone, social security number or date field. This feature is helpful when you do not want to fill in all of the fields on a page. If, on the other hand, you complete the page, the Dynamic Prompting will change to tell you how to edit that page, go on to the next page, etc. A similar message will appear when you have completed the last page, or if you enter a CTRL/N from the last page.

Please note that it is NOT important to memorize all of these steps. The only important things to remember are that the information you need will be listed at the bottom of your screen, and that D B MASTER will keep you from doing things that you shouldn't do!

The first few records that you add will not require any disk access by the computer. This is because D B MASTER stores records in BLOCKS, and will not go to the disk until a block is filled or it needs to enter a record into a different block. Disk access (and thus record entry time) will be minimized by A) entering new records in Primary Key order, and B) not creating your secondary keys until after you have entered the records that you will start your data base with. (See How D B MASTER Stores Records.)

The program will prompt you if it needs a different diskette. If your file is large, you should always keep a couple of blank disks available in case your files expand beyond the current number of disks. D B MASTER will initialize new disks for you when it requests a blank disk, so there is no need to pre-initialize your diskettes.

After you have entered a few records, return to the Main Menu by entering a CTRL/C. Next you will learn how to search for and edit your records.

CHAPTER 3 - FINDING & DISPLAYING RECORDS

1. Primary & Secondary Key and Sequential Searches

D B MASTER has a number of ways to find a record that you wish to display, and the program is "smart" enough to use the fastest method available, based on the information that you have given it. However, it helps to be aware of the different types of searches that the system uses.

The fastest search is by primary key. If you give the program the entire primary key of the record you are looking for, it will be found and displayed within about two or three seconds (plus the time necessary to insert a different data diskette, when required). Larger records may take slightly longer because of the time necessary to "unpack" the data and change it to the form in which it is displayed on the screen.

A full primary key search will return the exact record desired. If the requested key does not exist in the file, an error message will be displayed on the screen, and you may then attempt a search for a different record. If the record is found, you may then ask for the next record (by entering a CTRL/N) and the program will display records in primary key order, beginning with the next record in the file. When the end of the file has been reached, an error message will appear, and the last record found will be displayed again. You may then request another search.

The next search type is a partial primary key search. In this case the program must have information about the first primary key field (the first field on your form). Any type of search will work, (range, wild card, etc. - see below) with the exception of the "includes" search, which looks for the characters you have entered in any position within an alphanumeric field.

A partial primary key search takes slightly longer than the full primary key search (about three seconds), and it will find the first record in the file which matches the information you have given it. If you have more than one record with the same beginning information, this may not be the record you wanted. In that case, enter a CTRL/N (for Next record), and the next record that matches your request (if there are any) will be displayed. When no more matches can be found, an error message will appear, the last record found will be displayed, and you may begin another search by entering a CTRL/F (for Find).

If the beginning of the primary key is not entered, the program will look to see if you have given it any information about secondary key fields. Again, any search type will work with the exception of the "Includes" search.

Secondary key searches take a maximum of about five seconds (if two disk accesses are required). As with a partial primary key search, a secondary key search will return the first record that matches your search criteria. You may then enter CTRL/N´s to skim through all of the matching records. If there are two or more records with identical secondary key contents, they will be displayed in the order of their primary keys.

Secondary key searches are only used by the system for displaying records on the screen or listing them to your printer. They are not used in preparing reports.

All searches that do not fit any of the above criteria will be done as sequential searches. Sequential searches begin with the first record in the file, and continue until a match is found or until all records have been checked. If a match is found, you may enter a CTRL/N to search for additional records which fit your criteria.

REMEMBER THAT RANGE AND RELATIONAL SEARCHES (see definitions below) MAY NOT WORK PROPERLY IF YOU USE NEGATIVE NUMBERS IN PRIMARY OR SECONDARY KEY FIELDS! See notes under Field Types, above.

2. Search Criteria Defined

NOTE: All of the search methods described beloware also used in selecting which records are to be included in a report prepared by D B MASTER's report generator.

When you enter a "1" from the Main Menu ("Display/Edit/Delete Records"), the first page of your form will appear on your screen. Two periods ("..") will appear between each field name and the input area for that field. And a strange list of abbreviations will appear on the second line from the bottom of the screen:

^^RNG *WLD CD ()INCL ?ANY <, =, >, <>, >=, <=

Let's look at what each of these abbreviations means, and how the different search types function:

1. ^^RNG means that to search for a RANGE of values for a particular field, you should enter "^^" (press SHIFT/N twice) at the beginning of that field. You may search for a range on any field type, alphanumeric, numeric, dollar/cents, etc. If the field is the first field in the file, or if it is a secondary key field, the requested range of records will be retrieved and displayed in their alphabetic or numeric order. A range search on a non-key field will find the proper range of records, but they will be retrieved in a random sequence.

The "^^" will be displayed where the two periods were, and a prompt at the bottom of the screen will say "ENTER MINIMUM VALUE FOR RANGE." The cursor will then move to the first position of the regular field. Type in the minimum value to search for, and press RETURN. (The search will include this value, ie, a search for a range of values WILL find values equal to its maximum or minimum.) The cursor will now move to the bottom of the screen, where a duplicate field will appear along with a prompt to "ENTER MAXIMUM VALUE FOR RANGE." Enter the maximum value and press RETURN.

For example, in an alpha field, entering "R" as minimum value and "TZ" for the maximum would find all records wherein that field's contents began with R, S or T.

SECONDARY KEY SEARCH:

FIRST D B MASTER "MATCHES" THE CONTENTS OF THE FIRST PART OF A
SECONDARY KEY RECORD WITH THE SEARCH CRITERIA YOU HAVE ENTERED:

SECONDARY KEY RECORD

```
(SECONDARY KEY) (PRIMARY) (KEY) (FIELDS)
```
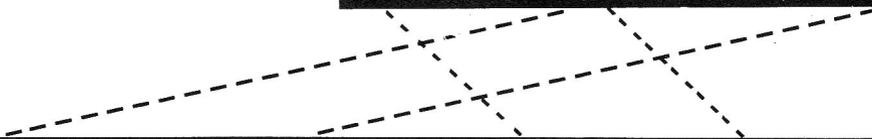
```
(PRIMARY) (KEY) (FIELDS) (REGULAR FIELDS) (SEC'Y KEY FIELD) (REGULAR FIELDS)
```

MASTER RECORD

THEN THE PROGRAM USES THE SECOND PART OF THE RECORD TO "POINT" TO THE
DESIRED RECORD IN THE MASTER FILE.

Or in a Date field you might ask for all dates in March thru May by entering the range 03-01- through 05-31-. (The program will let you leave formatted fields incomplete when you are setting up your search criteria.) Or use 80-03-01 and 80-05-31 if you store your dates as YY-MM-DD. Note that pre-formatted fields are searched as alphanumeric fields. A search on the range 03-01-80 to 05-31-80 will find records from March thru May of any year!

2. *WLD CD stands for a "WILD CARD" search. Wild Card searches do not work on numeric or dollar/cents fields. In a wild card search, you ask the program to search for a match on the first one or more characters in the field, ignoring whatever characters may follow.

To enter a wild card search, DO NOT type the "*" as the first character!! Instead, type the characters you want the system to match then enter a "*" after your last character. (The first character that you enter will blank the ".." and skip directly to the regular field.)

For instance, suppose that you are searching on a CITY field. If you enter "S*", the program would find records that include St. Louis, South Fork, Sacramento, and so forth - any city that begins with an "S".

If you enter "SAN*", the program will still find San Diego, Santa Fe, and Sandusky. But if you enter "SAN FRANC*", the odds are that you will only find San Francisco.

Likewise entering "JOHNSON*" for COMPANY NAME would find Johnson & Co., Johnson Products, Inc., Johnson & Daughter, etc.

Or you could ask for all records within the month of May by entering 05-* (which would find records from May of any year) or 80-05-* into a Date field. Likewise entering 80-* would find all dates in 1980 if your records are stored as YY-MM-DD.

Thus the wild card search can be used either to save some typing time (as a kind of "shorthand"), or in a case where you are unsure of the proper spelling, length, or contents of a field.

3. ()INCL stands for INCLUDES. This search is similar
to the wild card, except that it will find the string
of characters you enter anywhere within a field,
instead of just at the beginning. This search type only
applies to alphanumeric fields.

For example, suppose that you had a file of magazine
articles, and you wanted to find all of the articles
that dealt with solar power. Moving the cursor to the
"TITLE" field, you would enter "()" which will display
where the ".." was, then type "SOLAR" into the regular
field. In this case the program would find such
articles as "Solar Cooking", "Building Solar
Collectors", and "Energy: Moving Towards Solar".

The Includes search is the most time-consuming search
done by D B MASTER. Also, requesting an Includes search
on a primary or secondary key field will cause that
field to be searched as a non-key field, although
search criteria entered into other key fields may still
enable the system to perform a primary or secondary key
search.

4. ?ANY. The question mark character may be entered in
any position in an Alphanumeric, Telephone Number,
Social Security or Date field (but NOT where the two
periods ".." are). It is used to tell the program to
accept ANY character in that position (such as when you
are unsure of spelling).

The "?" search ONLY works when no other search symbols
have been entered for that field! (Otherwise, you would
not be able to search for a field that actually
contained a question mark!) However, THE "?" SEARCH IS
ALSO A WILD CARD SEARCH. That is, only the characters
you type into the field will be considered by the
search, and any additional characters in that field in
your records will be ignored.

For instance, if you were looking for a last name, but
were unsure if it was Van Ryan or Von Ryan, you would
enter "V?N RYAN" and the program would find the record
either way. (Since this is also a wild card search, the
same set-up would also find Van Ryan & Co., Von Ryan's
Express Service, etc.) Likewise entering "N??LSON" would
find Neilson, Nielson or Neilsonburg.

6.   T/TOTAL--Statistics. This powerful search is valuable for any data base you create.   You can quickly determine statistical relationships between selected (or all) records.

To use this feature, set up the search criteria for a set of records as you would normally. When the cursor gets to the field that you wish to work with, enter a Control/T.   The letter T will appear on the form at the cursor position.   You may then enter search criteria in that field, or move on to a later field, or, if you have entered all of your criteria, enter Control/F to find those records.

Instead of showing you the records, the program will clear the screen and display a running summary.   As records are found which match your criteria the display will show the Count, Sum, Average, and Standard Deviation for the field "marked" with the Control/T.   If the chosen field is non-numeric only the Count will be displayed.

The displayed TOTALS are determined as follows:

Count = the number of records found which match your search criteria

Sum = the total of the values found in the chosen field, in all of the records which match your search criteria

Average = the Sum divided by the Count

Standard Deviation = the measure of how far the individual values deviate from the mean.   Due to inaccuracies inherant in Applesoft Basic, a small "fudge factor" has been added to the formula for standard deviation.   This   factor will only be noticeable in cases where the standard deviation approaches zero.

The totals function gives you the capability to get "column totals" without   going into the report generator.   Computed fields may also be totaled and analyzed using this feature.

SPECIAL SELECT CRITERIA FOR AUTO-DATE FIELD

SELECTING BY YEAR: You can select all records from the current year by entering ??-??-99 into an Auto-Date field as part of your Select Criteria.

SELECTING BY MONTH AND YEAR: All records from the current month and year may be selected by entering 99-??-99 into an Auto-Date field as part of your Select Criteria.

SELECTING BY CURRENT DAY: All records with the current day may be selected by entering 99-99-99 into an Auto-Date field as part of your Select Criteria. The selected date will automatically change to a new current date the next day the report is run.

All Special Auto-Date Select Criteria may be used in conjunction with any other Select Criteria you desire.

Everyday a new report is printed D B MASTER will automatically change the Special Auto-Date Select to the NEW current day, month or year. The date the report was created is used only if you run the report right after creating.

Similarly, in a date field, you might enter 01-??-80 to find all records for January, 1980, or ??-??-80 to find the records for the entire year.

5. The remaining search criteria are all "relationals." They include:

< LESS THAN

= EQUALS

> GREATER THAN

<> NOT EQUAL TO

>= GREATER THAN OR EQUAL TO, and

<= LESS THAN OR EQUAL TO

Relational criteria may be used for searching any of D B MASTER's field types.

Note that entering > ABC will find all records beginning with ABCA and continuing through the end of the alphabet. (To find ABC itself, you would have to enter >= ABC.) ABC*, on the other hand, will only find those records in which that field actually begins with ABC.

Also note that in a string field (as opposed to a numeric field), "-3" will be treated as GREATER THAN "-2", since the characters are being treated as letters, rather than numeric values.

3. Entering Search Criteria

You will note that when you come to each field in a search form, the cursor goes to the first of the two periods following the field name. If you enter a ^, <, >, =, (, or) it will appear at the cursor. Any other character will erase the ".." and skip to the regular field. If no other search symbols are entered, D B MASTER will assume that you are looking for an exact match on the contents of that field. This is the same as entering an "=" sign at the beginning of the field.

D B MASTER will let you search on any combination of criteria on as many as twenty fields at a time (although each search for a range counts as two of the 20). The program will warn you if you try to enter too many criteria.

Likewise, the program will not let you enter an "illegal" combination of search characters: ">^" for instance will cause an error message to be printed and give you another chance to enter your data.

Note that you can search for the contents of an Auto Date field. This will let you search for records that were entered or edited on a specific date, within a range of dates, or before or after a specific date. It is also useful, after making a number of changes in your file, to have the program list on your printer (menu option #3) all of that day's edits and additions (see Printing a Daily Update List).

If you press the ESCape key while entering search criteria, the current field of information and any fields that you back up to will be erased. This is unlike the ESC function when adding or editing records, and is due to the fact that search criteria must be entered in the order in which the fields appear on the form. You may then re-enter whatever search criteria you need.

Entering a CTRL/N while setting up search criteria will move you to the Next page without having to skip through the rest of the fields on the current page. CTRL/C will cancel the search and return you to the Main Menu.

When you have entered all of the criteria you wish to match on this search, enter a CTRL/F to Find the record(s) you are looking for. You may enter the CTRL/F from any point on the screen.

To skim through all of the records in a file, simply enter a CTRL/F without entering any search criteria.

While the program is searching through your records, an indicator will flash in the lower right hand corner of the screen, showing that thingsare working properly. Depending on the search type, your disk drives may come

D B MASTER MAKES IT EASY TO SEARCH FOR RECORDS!
Just enter the information to search for on your form:

```
FIND => ADDRESS FILE                    P.1 OF 2


NAME    MIKE*_____
ADDRESS .._____
CITY ()GLEN_____
STATE <>CA
       PHONE # ..___-___-____
       BIRTHDATE ..__-__-__




^^RNG *WLD CD ()INCL ?ANY <,=,>,<
CTRL: F=>FIND O=>OR C=>MENU N=>N'
```

THE "WILD CARD" SAYS TO IGNORE THE REST OF THE FIELD. ONLY MATCH ON THE BEGINNING CHARACTERS.

THE "INCLUDES" SEARCH LOOKS FOR THE CHARACTERS YOU ENTER ANYWHERE WITHIN THE FIELD. (THE EXAMPLE WILL FIND MAPLE GLEN. GLENDALE OR SOUTH GLEN JUNCTION.)

THE SEARCH SYMBOLS GO ON THE TWO PERIODS AT THE BEGINNING OF EACH FIELD. ANY OTHER CHARACTERS WILL SKIP TO THE UNDERLINED PORTION OF THE FIELD.

USE QUESTION MARKS IN PLACE OF LETTERS IF YOU ARE UNSURE OF THE PROPER SPELLING FOR A FIELD'S CONTENTS.

YOU CAN SEARCH FOR A RANGE OF ALPHABETIC OR NUMERIC VALUES.

ENTER CONTROL/F (FOR FIND) TO BEGIN YOUR SEARCH. OR CONTROL/O (FOR OR) TO SEARCH FOR THE INFORMATION ON THIS FORM "OR" THE DATA TO BE ENTERED ON ADDITIONAL FORMS.

on one or more times during the search. If you only
have one disk drive, or if your file extends over more
than one diskette, you may be prompted to insert other
volumes when the program needs them.

You may abort a search at any time by pressing the ESC
key.

D B MASTER issues a standard message whenever it cannot
fill a request to find a record. "CAN'T FIND RECORD"
means that there are no records (or no additional
records if you have entered a CTRL/N for Next record)
that match the selection criteria that you have set up.
The same message is issued if a search reaches the end
of the file. If any records have been found in that
search, the last record that was found to match your
criteria will be displayed again after the error
message. That way if you have been skimming through a
series of records, you will always know at what point
your search failed. You may then enter a CTRL/F (Find)
to set up another search. If no records at all were
found by your search, the program will go directly from
the error message to the Find mode.

4. "AND" and "OR" Searches

If you enter search criteria into more than one of the
fields on your form, D B MASTER will assume that you are
only looking for records which match ALL of the
criteria you have entered.

For instance, if you enter "PHILA*" for City and
">=100" for Amount Due, the program will only look for
records which include Philadelphia (or anything else
that begins with PHILA) AND have an amount due of
$100.00 or more. This is called an "AND" search.

However, there may be times when you are interested in
two or more possible values in the same field. For
example, you might be looking for Dick OR Jane Smith,
or for a supplier in Dallas OR Fort Worth, or for zip
codes that fall within three or four different ranges.

To accomodate these situations, D B MASTER includes an
OR search capability. The OR search uses two or more
complete forms. The search will treat multiple criteria
WITHIN a form as "ANDS," then search for a match on the
first form's information OR the second OR the third,

and so forth, to a maximum or ten "OR"'s.

To set up an OR search, enter the first set of criteria to be OR'd into the form on your screen. Then enter a CTRL/O (for OR), and after a moment a fresh form will appear. Enter the second set of values, and so on. When you have entered all of your search criteria, enter a CTRL/F (for Find) as you do with an AND search.

If you are searching on more than one field, you may have to re-enter some information on each of your OR forms. For example, to search for any one of several names in the same city, you must fill in the CITY field on each form. If you leave the CITY field blank on one of the forms, the name on that form will be found regardless of which city they are from, and you may end up finding a record that you do not want.

Note that the limitation of twenty search criteria still applies. That is, the total number of all of the search criteria you enter on all of the forms to be OR'd cannot exceed twenty (and each range criteria counts for two). The number of "OR"'s is limited to ten per search. If you try to go beyond either of these limitations, the program will go ahead and begin its search based on the information that it has.

CHAPTER 4 - PRINTING & EDITING RECORDS

Once you have a record displayed on your monitor, you have several options available to you.

Pressing the RETURN key will display the next page. If you are already on the last page of your form, the first page will be displayed again.

Entering a CTRL/N will begin a search for the next record, according to the rules discussed under PRIMARY AND SECONDARY KEY AND SEQUENTIAL SEARCHES, above.

CTRL/F will go to the search form so that you may Find a different record. CTRL/C returns you to the Main Menu.

1. Printing One Page of a Form

NOTE: If you have not set up your printer parameters, please do so now. See "Entering Printer Parameters."

You may send the page of the form which is on your screen to a printer for "hard copy." To do this, simply enter a CTRL/P (note the Dynamic Prompt CTRL/P => PRINT). D B MASTER will ask for your printer slot number, with a default value set to slot #1, or whichever slot you have established as your standard printer slot through the File Maintenance module. (See the section on File Maintenance for details on this procedure.) You may confirm the slot number by pressing return, or enter a different slot number. BE CAREFUL - IF YOU DO NOT HAVE AN INTERFACE CARD AND A PRINTER CONNECTED TO THE SLOT YOU HAVE ASSIGNED, D B MASTER MAY CRASH AT THIS POINT!

You will then be reminded to turn on your printer and press RETURN again. A list of the field names and contents of the current page will be sent to your printer. (Read protected fields will not be included if you have entered the file with a read only password.)

2. Editing & Deleting Records

Once you have a record displayed on your monitor, it is quite easy to edit (change the contents of) the record. You will notice that the Dynamic Prompting now includes "ESC => EDIT." So simply press the ESCape key, and you will find yourself in the edit mode!

To edit your record, use the normal form operating procedure: press RETURN to accept the data on the screen and move to the next field, or type new data into any field. The ESC key works as before: that is, it will take you back to the prior field without disturbing the contents of the field you are in when you press ESC.

The Dynamic Prompting tells you that you may enter a CTRL/N to jump to the Next page of the form (if you are on the last page of the form, CTRL/N will return you to the first page for continued editing). CTRL/V will Void the edit, returning the record to its original condition and putting you back in the display mode. CTRL/S will Save your changes, putting the modified record back into the file, and updating primary or secondary keys if necessary. IF YOU EDIT A RECORD THAT INCLUDES AN AUTO DATE FIELD, THE CURRENT DATE WILL AUTOMATICALLY BE INSERTED INTO THAT FIELD. See "Printing a Daily Update List", below.

Entering a CTRL/D from the edit mode will let you Delete a record. In order to complete the deletion, you must type the entire word "YES" in the space provided at the bottom of the screen and press RETURN. Entering anything other than "YES" before pressing RETURN will cancel the delete and leave the record in the file.

ONCE A RECORD HAS BEEN DELETED FROM YOUR FILE, IT CANNOT BE RETRIEVED. This is another good reason for keeping back-up copies of your data diskettes.

NOTE: If you edit a primary key field in such a way that the key of the record you are editing will duplicate the key of another record, the error message "Unable To Change Record" will appear on your screen, and the record will be left unchanged. The same result will occur if you re-type the contents of a primary key field without changing it - that is, change the record to equal itself. Again the record will not be changed or damaged in any way, and you may attempt another edit.

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```
EDIT => ADDRESS FILE              P.1 OF 2


NAME MIKE SMITH
ADDRESS 1234 MAIN ST.
CITY ANYTOWN
STATE CA
      PHONE # 415-123-4567
      BIRTHDATE 07-04-47




+=>MATH, CTRL: /N=>NEXT PAGE, /I=>INCREMENT
/D=>DELETE /V=>VOID EDIT /S=>SAVE EDIT
```

SKIM THROUGH THE FORM BY PRESSING THE RETURN KEY. ENTER YOUR CHANGES BY TYPING THEM IN THE PROPER FIELDS.

ADD 1 TO THE VALUE IN A NUMERIC FIELD.

RESTORE THE RECORD TO ITS ORIGINAL VALUES.

THE CALCULATOR MODE WILL ADD, SUBTRACT, MULTIPLY OR DIVIDE THE CONTENTS OF A NUMERIC FIELD BY ANOTHER NUMBER , AND PUT THE RESULT BACK INTO THE FIELD.

PERMANENTLY REMOVE THE RECORD FROM THE FILE. (BUT FIRST YOU WILL HAVE TO TYPE THE WORD "YES" TO CONFIRM THE DELETE ORDER.)

3. The Calculator Mode

Another function of the **editor** is the calculator or math mode, indicated by "+ => **MATH**" on the screen. To use the calculator, move **the** cursor to the first position of any numeric or dollar/cents field, and enter a "+" sign. The "+" will NOT be printed on the screen. Instead, a prompt at the bottom of the screen will ask which operation you wish to perform ("+", "-", "*" or "/").

When you have entered a valid operation sign, you will be asked for a constant which will be the other operator for your calculation. The calculation will be performed, and the result will appear in the field. (Note that you may still restore the old value at this point by Voiding the edit with a CTRL/V).

The Calculator mode will try to fit the results into your field. Dollar/Cents fields will round off fractions of a penny: $1.234 will become $1.23, and $1.235 will be entered as $1.24. Small and Large Integer Numeric fields will round off fractional results: 1.49 will be treated as 1, while 1.5 will become a 2.

If the result of a calculation is too large or too small for your field type or will not fit in your field length, the message "RESULT DOESN'T FIT!" will appear on the screen, and you will be returned to the editing mode. You may then enter "+" to attempt another calculation.

4. The Increment Function

In addition to the Calculator mode, D B MASTER also includes a simple "increment" function. This feature is useful if you simply wish to add 1 to the value in a numeric field. To do so, move the cursor to the desired field and enter a CTRL/I (for Increment). The value displayed in the field will be increased by 1, unless doing so would put the value of the field outside of its legal range, or make the number too long for its field length.

Entering CTRL/I a second or third time, etc, will continue to increment the value in the field by one

until one of the limits mentioned above is reached, in which case the computer will "beep" and the value in the field will not be changed.

The Increment function is also available when adding records, where it is particularly useful for sequential record numbering in the "Last Record Default Mode" (see Adding Records to a File).

5. Tutorial - Part 5 - Search & Edit

If you haven't already done so, try using the various search options with your file. (It's difficult to give specific directions at this point, since only you know what records you've entered.)

Try going back a few pages in the manual and practice doing at least one of each of the different searches: range, wild card, OR's, etc.

Try just entering a complete primary key, to see how fast a primary key search is. Also try requesting a record by a secondary key.

Once you have a record on display, try each of the options listed in the Dynamic Prompting at the bottom of the screen. Skim through a series of records using CTRL/N's. If you have a printer connected to your Apple, try printing a page of one of your records.

Also, practice editing records. Skim through a record, making whatever changes you like, then enter a CTRL/V to Void the edit, or a CTRL/S to Save your changes.

And don't forget to try the calculator mode! While in the edit mode, move the cursor to a numeric field, and enter a "+" sign. Then follow the directions on your screen. This can be one of the handiest features of D B MASTER.

Finally, read the next two sections on printing records and daily update lists, and try each of those features.

6. Listing Records to a Printer

NOTE: If you have not yet set up your printer parameters, please do so now. See "Entering Printer Parameters."

We have seen that individual pages of a record may be printed while in the Display mode. D B MASTER also has a mode that will "dump" or "list" one or more entire records on your printer. This is a convenient way of getting a "hard copy" of one or more records without having to run a report.

Enter a "3" from the Main Menu (LIST RECORDS TO PRINTER). The program will ask you to confirm your default printer slot (see PRINTER PARAMETERS under FILE MAINTENANCE) or to enter a different slot number, then to turn on your printer and press RETURN.

Now use the same procedure for entering search criteria that you use to retrieve records for screen display. You may enter criteria that will select one or more records. IF YOU ENTER CRITERIA THAT WILL RESULT IN A PRIMARY KEY SEARCH (i.e., an exact primary key), THE PROGRAM WILL PRINT ALL RECORDS, BEGINNING WITH THE FIRST RECORD THAT MATCHES YOUR REQUEST, AND CONTINUING THROUGH THE END OF THE FILE. You may abort the printing at any time by pressing the ESCape key.

For each record that you choose, the program will print the name of each field, followed by the field contents. If you have entered a Read Only password, any Read Protected fields will not be printed.

If you have loaded a "Short Form" (see Short Forms, below) only those fields on the short form will be printed.

You may stop the printout by pressing the ESCape key. The printout will stop after the current record has been completed.

To print all of the records in a file in primary key order, enter a CTRL/F from the search form without entering any criteria.

To print records in secondary key order, move the cursor to the desired secondary key field, and enter ">=A" for an alphanumeric field or ">=0" for a numeric field. You may also print records in secondary key order beginning with, ending with, or within a certain range of values by entering the proper select criteria.

7. Printing a Daily Update List

If you have an Auto Date field in your record (we recommend using one in each file), you may print a list of all of the records which have been added or edited on any date by entering the desired date into the Auto Date field as your only selection criteria. Be sure to enter the date in the MM-DD-YY format used by Auto Date Fields.

All changes made within a range of dates or before or after a certain date may also be printed by entering the appropriate selection criteria.

Daily update lists are particularly valuable if you are not backing-up your data diskettes each time you make a change in your file (generally back-ups are only done when a number of changes have been made). If you catalog your data diskette (first boot normal DOS from another diskette, then catalog your data diskette as you would a normal disk), you can find out when your last back-up was made using the re-block procedure (ie, when your current data disk was made - see Re-Blocking Files under FILE MAINTENANCE). A printout of all changes made since your last back-up will be invaluable in restoring your files in the event that one of your data diskettes is damaged.

Note that this procedure may not work accurately if you are not entering the proper information when the program asks you for the current date!

OPENING & CLOSING FILES

1. Opening a File & Loading a Different File

There are two ways to open or load a file with D B MASTER: upon "booting" the system, or from the Main Menu.

Normally, when you enter the program by "booting" your program diskette, you will then insert the "Utility" disk (volume one) of the file you wish to work with into the appropriate disk drive.

2. Entering the Date & Password

The program will then check to see if you have one of the clock cards that it supports installed in your Apple. If you do not, you must enter the correct date in the format displayed on the screen. If you do have a clock, D B MASTER will read the date from the clock and ask you to confirm it (by pressing RETURN) or to enter a different date (by pressing ESCape).

Note that the various clocks only provide the system with the month and day, not the year. So D B MASTER takes the year from the last date that the file you are entering was accessed. Obviously, if the year has changed in the interim, you will have to correct the date.

Likewise, the first time you run the program, or any time you ask to create a new file before going to the Main Menu, the program will have to ask for a date whether or not you have a clock in your Apple.

If the file you are entering requires a password, you must now enter your code. Your password will NOT be displayed on the screen as you enter it. Instead a "*" will appear for each letter you type. You will be given three chances to enter a valid password.

Once the date and password have been entered the program will go to the Main Menu.

The program will go through the same procedure if you enter a "7" from the Main Menu for Load or Create New File, except that generally you will not have to re-enter the date. Note that if the new file you are opening requires passwords, you will have to enter a new password regardless of your password level with the previous file.

3. Exiting D B MASTER

* * * NEVER * * * NEVER * * * NEVER * * * NEVER * * *

NEVER leave D B MASTER except by entering an "8" from the Main Menu (Close Files & Exit)!

If you leave the program in any other fashion (pressing RESET, turning off the power, etc.) you run the risk of damaging your file.

Since the program does not include Apple's disk operating system, if you wish to run other programs after leaving D B MASTER, you must re-boot the system. Or, to re-enter D B MASTER, re-boot your program diskette.

CHAPTER 6 - SHORT FORMS

1. What is a Short Form?

A Short Form is a special form which only contains a few of the fields in a file's normal or main form. Short forms are used for rapid "updating" or editing of the same field or fields in a number of records. They may also be used to emulate a hierarchical data base system. (See Appendix)

When you have loaded a short form, you will only see or have access to the fields that you have included in that form. If you enter a CTRL/P to print a displayed page, only the displayed fields will be printed. Likewise if you enter a "3" from the Main Menu (List Records to Printer), only the fields of the short form will be printed.

However, the entire record is in the computer. An Auto Date field that is not displayed will still be changed if the record is edited, and if you delete the record, the entire record will be removed from the file.

Short forms may contain 1 to 24 fields chosen in any order from among the fields of your main form. The fields may all come from the same page of the main form, or they may be chosen from several different pages. The short form should include either the first field of your file (or, optionally, the entire primary key) or at least one secondary key field. In any case, it must include enough fields to assure you that you are editing the correct record (remember that you may have several records with the same secondary keys or the same contents in part of the primary key). Otherwise you will have no way of knowing which records you are editing!

IF YOU WISH TO BE ABLE TO ADD RECORDS USING A SHORT FORM, THAT FORM MUST INCLUDE ALL OF THE PRIMARY KEY FIELDS, IN ORDER, AS THE FIRST FIELDS ON THE SHORT FORM. In other words, the beginning of that short form must be the same as the beginning of the first page of the main form (although the actual horizontal and vertical locations of the fields does not matter). If you will not be using a particular short form for adding records, this restriction does not apply.

For example, let's say that you have built an Accounts Receivable file with three pages in its main form. There are 20 or 30 fields of information about your clients' addresses, billing cycles, recent charges, and so forth. The primary key includes the client's last name, plus a unique client number. The client number has also been set up as a secondary key field. That way you can find any client's record by last name or number.

Now once a week you wish to update the Amount Due field in the records of all of the clients that have charged services during the previous week. You could create a short form which consisted of just the client number and amount due fields. Then by loading that short form you could call up each record by entering just the client number (remember – these are unique client numbers, otherwise you won't know which client you're adding charges to!) then use the Calculator mode to add the new charges to that client's previous balance.

If the client numbers were not unique, you could put the first field of the file (Client Name) BELOW the other two fields on the main form. That way you could still call up the records by number and perform your edit without having to skip over a lot of other fields, but now you will be able to confirm that you do, indeed, have the correct record.

2. Creating Short Forms

To create a short form, enter a "4" from the Main Menu (Load or Create Short Form), then say that you do wish to create a new form. Follow the instructions to insert your D B MASTER program diskette, and in a moment you will see the Short Form Menu.

The Short Form Menu has three options: Create a Form, Delete a Form, or Return to Main Menu. To create a form, enter a "1."

You will now see a list of the fields in your file displayed on your screen. If there are more fields than will fit on the screen at one time, you may enter a CTRL/N to see the next page of the list (note the Dynamic Prompting at the bottom of the screen).

If you enter a CTRL/D, you will see the same scale that you used in creating your file. Now you will use the scale to place fields on your new short form.

While you are creating a short form, you may use CTRL/D to switch back and forth between these two Displays - the field list and the form display - as often as necessary.

To create your new form, you must enter the number of the field you want, then its new vertical and horizontal position. As always, the program will keep you from overlapping two fields or going off the edge of the screen.

If the field list is on display when you finish entering a field, the display will automatically switch to the form so you can see what you have built so far. You may then switch back to the field list to get the number for your next field.

REMEMBER: SHORT FORMS SHOULD ALWAYS INCLUDE ENOUGH FIELDS TO ALLOW FOR RAPID SEARCHES (primary or secondary key fields) AND TO POSITIVELY IDENTIFY EACH RECORD. If you plan to add records while using a short form, that form MUST include all of the file's primary key fields, in order, as the first fields on the short form.

If you are using a short form for rapid editing (as opposed to special file functions - see Emulating a Hierarchical Data Base), it is best not to include any more fields than you really need. The field that you will be using to call up records (usually a key field) should be the first field on the form. The next field should be the one which you will be editing most often. Any other fields needed for record identification, etc., should be added last.

If you try to enter the same field twice on the same form, the computer will "beep" at you and you will have a chance to enter a different field number.

When you have placed all of the fields on the form, enter a "0" for Field #. The program will now let you edit any of the fields that you wish to move around on the form. Note that you can only change the positions of the fields, not their field numbers, lengths, etc.

Finally, enter a name for the form you have created (make your names descriptive - otherwise you may have trouble remembering what is on each form). The program will return you to the Short Form Menu. To create another short form, enter a "1" again.

You may have as many short forms as you wish for each file. But remember that each one takes up room in the Utility file, so it is best to only create those forms that you will use regularly, and to delete any which you are no longer using.

To delete a short form, enter a "2" from the Short Form Menu. A list of the forms you have created for this file will appear. Enter the number of the form you wish to delete, or a "0" to return to the menu.

When you are ready to return to the Main Menu, enter a "4" from the Short Form Menu, and follow the directions on your screen.

3. Loading a Short Form

Switching between short forms and the normal form takes only a few seconds, so you should feel free to switch forms as often as necessary for your convenience.

To load a short form, enter a "4" from the Main Menu, but this time say that you do not wish to create a new form. Again you may have to insert the D B MASTER program diskette to get to the Short Form program module.

A menu of the short forms you have created for your file will appear on your screen. Simply enter the number for the form you wish to load. "0" is always the "Standard Form", the form you originally set up to create your file.

It takes only a moment to load the form. The program will then automatically return to the Main Menu.

To re-load the main form, follow the same procedure and enter a "0" for the form to load. Note that some D B MASTER procedures (including File Maintenance and the Report Generator) will automatically reset the system to the main form.

PART II - THE REPORT GENERATOR

CHAPTER 1 - INTRODUCTION

D B MASTER includes a powerful system that may be used to prepare reports. Each report is based on the information contained in records selected from one file. Most reports will be printed on paper, but D B MASTER will also display reports on your video screen.

Each report is based on instructions contained in a Master Report Format, a format being a set of instructions or specifications. For your convenience, we have divided the Master Report Format into four "sub-formats," which will be described subsequently. Once you have created some of these sub-formats, you can create a new Master Report Format based partially or completely on existing sub-formats. This means that different variations of a report can be prepared without entering all of the information required for an entirely new report.

Creating a report format includes quite a few steps, and may seem to be rather complicated. But D B MASTER will "walk you through" the process and will keep you from making any major mistakes. If you take your time and read the Dynamic Prompting and other instructions on your screen, you will find that the process is really not very difficult, and that D B MASTER's report generator will put a tremendous amount of power and flexibility at your fingertips!

1. The Four Sub-Formats

Let's look at each of the sub-formats:

1. The PAGE Format determines the overall appearance of your report. Page numbering, whether the report will be dated, the number of lines on a page and the spacing between records are included in the Page Format.

D B MASTER INCLUDES A POWERFUL REPORT GENERATOR:

SORT YOUR RECORDS ON AS ANY AS 6 FIELDS AT A TIME

YOUR REPORTS CAN BE DATED AUTOMATICALLY

PRINT COMMENT LINES AT THE TOP OF EVERY PAGE

AUTOMATIC PAGE NUMBERING

```
2-SEPT-80                    1980 CENSUS PROJECTION              PAGE 1

                     THE PROJECTED 1980 POPULATION IS BASED UPON
                               A STEADY RATE OF GROWTH

STATE           1960        1970        CHANGE      DIFFERENCE   PROJECTION
NAME            CENSUS      CENSUS                   (PERCENT%)   FOR 1980

ALABAMA         3266740     3444165     177425       5.4         3631226
ALASKA          226167      302167      76000        33.6        403705
ARIZONA         1302161     1772482     470321       36.1        2412675
ARKANSAS        1786272     1923295     137023       7.7         2070828
CALIFORNIA      15717204    19953134    4235930      26.1        25330685
```

THIS REPORT WAS PRINTED IN STATE ORDER

VALUES IN THESE FIELDS WERE COMPUTED BY THE REPORT GENERATOR

NUMERIC VALUES ARE FORMATTED FOR EASY READING AND BETTER LOOKING REPORTS

USE UP TO 9 LINES FOR COLUMN TITLES

THIS TIME THE FILE WAS SORTED BY THE CONTENTS OF THIS FIELD

YOU CAN ALSO PAGE BREAK AT YOUR SUBTOTAL BREAKS

YOUR REPORTS CAN BE AS WIDE AS 132 COLUMNS

```
MICHIGAN         7823194     8875083     1051889     13.4        10068406
OHIO             9706397     10652017    945620      9.7         11689761
ILLINOIS         10081158    11113976    1032818     10.2        12253608
TEXAS            9579677     11196732    1617053     16.9        13082742
PENNSYLVANIA     11319366    11793909    474543      4.2         12288346
NEW YORK         16782304    18241166    1458862     8.7         19527062
CALIFORNIA       15717204    19953134    4235930     26.1        25330685
- - - - - - - - - - - - - T O T A L S - - - - - - - - - - - - -
                 179323175   192482334   23159159                230159011
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

PRINT SUBTOTALS WHENEVER SORT FIELD VALUES CHANGE

GRAND TOTALS APPEAR AT THE END OF THE REPORT

USE UP TO NINE LINES FOR EACH RECORD:

```
CLIENT: LARRY KLINE          CLIENT NUMBER:   83
HOURS WORKED:    21    #HOURLY RATE:   25.00    =HOURLY FEES:   525.00
                                               +TRAVEL EXP $:   84.34
                                               =AMOUNT DUE:     609.34


CLIENT: JERRY SERVICES       CLIENT NUMBER:   283
HOURS WORKED:    12    #HOURLY RATE:   22.00    =HOURLY FEES:   264.00
                                               +TRAVEL EXP $:   31.56
                                               =AMOUNT DUE:     295.56


CLIENT: LUCKY PROMOTIONS     CLIENT NUMBER:   566
HOURS WORKED:    7     #HOURLY RATE:   25.00    =HOURLY FEES:   175.00
                                               +TRAVEL EXP $:    6.10
                                               =AMOUNT DUE:     181.10
```

REPEAT YOUR FIELD NAMES IN EACH RECORD FOR EASIER READING

VARIABLE SPACING BETWEEN RECORDS

(YES, D B MASTER WILL ALSO PRINT LABELS.)

2. The DATA Format is the main sub-format. It holds the actual information that will be printed or displayed in your report. Comments and footnotes, column titles, and the actual data, computed and comment fields and their positions are all in the Data Format.

3. The SORT Format determines the order in which the selected records will be printed on your report.

4. The SELECT Format contains the selection criteria that choose which records from the file will be included in a report. A Select Format is set up in the same way that you enter your criteria to search for a record or records in the Display mode.

2. Creating a New Report Format

From the Main Menu, enter a "5" (for Set Up or Print Report). The program will then ask if you wish to create a new report format. If you answer "No," you will be given a list of the previously created report formats, and you may choose which of them you wish to run. Note that there is one standard Master Report Format which is always available. That format includes the four standard sub-formats which are described below. It is called "Print All Rec´s." This master format will print as many of your fields as will fit on nine lines of 79 characters each, and will print those fields for all of your records in primary key order.

If you answer that you do wish to create a new format, you may choose or create the four sub-formats for your new Master Report Format.

At the beginning of each sub-format, you will see a list (or "menu") of the sub-formats which have already been created for that part of the report. As in the other menus, each item will have both a name and a number.

Each menu will begin with a standard format that is automatically put there by the program, and will also include any sub-formats that you have already created for that file. (Note that report formats are stored with each FILE. Formats and sub-formats created for one file cannot be used with a different file.)

If you enter a "0" to create a new format, the program will go directly into the setup for that format. If, on

the other hand, you pick one of the existing formats (one which you created earlier, or the standard format set up by the program), another menu will appear on your screen. Your choices will now be:

1. PRINT out the specifications for that format. If you choose this option, the program will print the format information and return once again to this menu. You may, if you choose, print the spec's for several formats before choosing the one you wish to use on your new report, or deciding to create a totally new sub-format.

2. REPLACE this format. Since you cannot delete sub-formats (you would have a problem if you tried to run areport which needed the sub-format that had been deleted) D B MASTER will allow you to replace formats which areno longer in use or which you would like changed, withnew formats. Note that any report set up earlier to use such a sub-format will then use the replacement format.

3. CHOOSE ANOTHER format. This option will return you once again to the list of formats. You may then choose another format, which will return you to this menu, or enter a "0" to create a new format.

4. MOVE ON to the next sub-format, and use the last format which you chose from the list here in constructing your new master report format.

This process makes it very easy to create a new Master Report Format from a combination of new and pre-existing sub-formats.

For instance, you can run reports with the same Data and Page formats, changing only the Sort or Select formats to change which records are to be printed or the order in which they will appear. Or by changing the Page format, you could print the same report single-spaced on continuous-form paper for in-house use, or double-spaced on single sheets of company stationery for an annual report. Likewise the same Page, Sort and Select formats might be used with Data formats containing different combinations of fields and computations for completely different reports.

Now we shall discuss the four sub-formats in the order that they are defined in the program.

EACH MASTER REPORT FORMAT INCLUDES FOUR SUB — FORMATS:

```
                    ┌─────────────────┐
                    │  MASTER REPORT  │
                    │     FORMAT      │
                    └─────────────────┘
```

PAGE FORMAT	DATA FORMAT	SORT FORMAT	SELECT FORMAT
PAGE NUMBERING	COMMENT LINES	SORT FIELDS	WHICH RECORDS TO
REPORT DATING	COLUMN TITLES	SUBTOTAL BREAK	INCLUDE IN
LINES PER PAGE	COMPUTED FIELDS	FIELDS	REPORT?
CONTINUOUS FEED /	DATA FIELDS	PAGE BREAK	
SINGLE SHEETS	COMMENT FIELDS	FIELDS	
LINES BETWEEN	HORIZONTAL SUB- &		
RECORDS	GRAND TOTALS		
LABEL FORMATS	COLUMN TOTALS		
	RECORD NUMBERING		
	CODE FIELDS		
	REPORT WIDTH		

CHAPTER 2 - THE PAGE SUB-FORMAT

The first step in setting up a Master Report Format is to choose or create a Page format. The Page format determines the overall appearance of the pages of your report. In most cases three or four page formats per file will fill all of your report generating needs. For instance, you might have one Page format for continuous-form paper, another for single sheets, and a third for printing mailing or inventory labels. A fourth page format might be used for preparing screen reports.

1. Label Formats

Enter a "0" from the Page menu to create a new Page format. Now the program will ask "Is This A Label Format?" Label formats do not include the date or page numbers. They are designed for printing mailing labels, inventory labels, etc. It is assumed that your blank labels are on a continuous strip. You may print up to 9 lines of data or comments on each label, then skip 0 to 9 lines before printing the next label.

If you have chosen to create a label format, you need only tell the program the number of blank lines to leave between labels. Note that you are entering the number of blank lines, not the common term for spacing. If you enter a "1", you will get what is normally called "double spacing," that is, one blank line between records.

2. Screen Reports

Any D B MASTER report may be sent to the video screen instead of to your printer. In most cases, however, the 40 column limitation of the Apple's screen will make reading such reports very difficult.

On the other hand, D B MASTER can produce a very useful screen report if you restrict the report width to 39. (If you go to 40 characters, you will get an extra blank line between records.) Note that you can still print as many as nine lines of data for each record, in case you cannot fit enough information into 39 characters each. If you use more than one data line per record, it is recommended that you leave at least one blank line between records for better readability.

The recommended page length for a screen report is 21 lines, and you should ask the program to pause at the end of each page (see below).

3. Normal Page Formats

If you are not creating a label format, the program will display a diagram of a typical report page, and ask you the following series of questions:

1. Print Date on Report? If you answer with a "Y", the current date will be printed at the top of each page.

2. Print Page Numbers? Answer "N" if you do not want your pages numbered.

3. How Many Blank Lines Between Records? As mentioned above, entering a "1" here will result in what is normally called "double spacing" - one blank line between records. Note that when D B MASTER is printing more than one line per record, single spacing (no blank lines) is used WITHIN the record. The number which you are entering here is for the spacing BETWEEN records. See "The Data Sub-Format," below, for leaving blank lines WITHIN a record.

4. Stop Printer Between Pages? If you will be using single sheets of paper for your report, enter a "Y". The printer will then stop between pages so that you can insert a new sheet of stationery. Note that this question has a "default" answer of "N". If you are using continuous-form paper, simply press RETURN.

SCREEN REPORTS: although you can stop and restart a screen report at any time, you will probably find it more convenient to have the system print a full screen page, then wait for you to press a key before it goes on to the next page. Answer "Y" for screen reports.

5. Lines Per Page: Print (56) Total (66). The first
part of this question ("Print") tells the report
generator the number of lines to print on each page. If
you have asked the program to stop the printer between
pages, the second part of the question is unnecessary,
and will not appear. If you are printing on
continuous-form paper, you must also tell the program
the total number of lines per page, so that it knows
how far to skip ahead before beginning the next page.
The default values of 56 and 66 will work for most
printers and reports. Or you may enter any other values
that you need.

IF YOU ARE PREPARING A SCREEN REPORT, ENTER 21 FOR
NUMBER OF PRINT LINES PER PAGE!

As mentioned earlier, the program will build one sample
of each sub-format for you. The page sub-format is
called "Standard Page." Its specifications are as
follows:

Print Date - Yes
Print Page Numbers - Yes
Print 1 Blank Line Between Records
Stop Printer Between Pages? - No
Lines Per Page - Print 56, Total 66

You have now completed a Page sub-format. The format
information will be displayed on the screen, and you may
start over if you have made any mistakes.

4. Tutorial - Part 6 - Page Formats

D B MASTER has the power to build reports with widely
varying appearances. In general, however, reports can
be divided into those that are designed for your
printer, and those that are designed for screen
display. They may be further divided into those that
use a single line for each record included in the
report, and those which use more than one line per
record.

In this tutorial, we will give two examples: a one line
per record screen report (which will also be useful on
your printer), and a multi-line printer format which
may be used for preparing mailing labels.

Note that when we discuss printer and screen reports
here, we are talking of reports designed primarily for
one or the other medium. However these reports are not
restricted to their designed use. Any of your reports
may be sent to the printer or the screen whenever you
wish.

A Simple Screen Report

We'll begin with a simple report designed for screen
display. From the Main Menu, enter a "5" (Set Up or
Print Report). Then answer that you DO wish to create a
new report by entering a "Y".

Depending on your system configuration, you may need to
swap diskettes. Follow the instructions on your screen.

The "Choose Page Format" menu will now appear on your
screen. The one choice on the menu is called "Standard
Page." That format is put there by the program when you
create your file.

Enter a "0" to tell the program that you wish to create
a new format. Next the program will ask if this is to
be a label format. Answer "N" (we'll come back to do a
label format later).

You will now have a rough diagram of a report page on
your screen. Each item on the page will be highlighted
in flashing video as the program deals with it. For
instance, the question now being asked is "Print Date
On Report?", so the "DATE" indicator on the page is
flashing.

Generally you will not need the date printed on your
screen reports, so answer "N" here.

Next the program will ask if you wish it to print page
numbers on your report. Page numbers, if requested,
will appear in the upper right hand corner of each
page. Page numbering is often helpful in screen
reports, so answer "Y".

Then you must tell the program how many blank
horizontal lines you want left between records on your
report. Note that what is normally termed "double
spacing" has one blank line, and "single spacing" uses
none. Generally, single spacing is better for reports

that use a single line for each record, while those which use more than one line per record are easier to read if you leave one or two blank lines between records. For this report, enter a "0".

Next the program will ask if you would like it to stop at the end of each page and wait for you to press a key before printing or displaying the next page. While this is normally used so you can put a fresh sheet of paper into your printer (when you are not using continuous form paper), it is also nice for screen reports, to keep the report from scrolling off of the top of the screen (although you can always stop and start the scrolling by pressing a key on the Apple's keyboard). Enter a "Y" in answer to this question.

The last question in the page format involves the number of lines to be printed on a page. For screen reports, enter the number 21. If you had not asked the program to stop between pages, it would also have asked for the total number of (print plus non-print) lines per page. That way, if your printer does not have an automatic form feed, D B MASTER will know how many blank lines to leave before printing the next page.

Finally, enter a name for the page format you have created - a descriptive name such as "Screen Format" is best. The program will then give you a chance to re-start the page format, or to move on to the data format.

CHAPTER 3 - THE DATA SUB-FORMAT

When you have selected or created a Page format, the program will move on to the Data format. The Data format includes all of the printed information which will be specific to this report.

Once again, a format list and menu will allow you to select a previously defined format to use, replace or print the specifications of, or to create an entirely new format.

1. Setting the Report Width

The first task in creating your Data format is to set your report width. The width will generally depend upon your printer, and perhaps the type of paper you are using. The program will accomodate widths of 10 - 132 columns. IF YOU ARE PREPARING A SCREEN REPORT, SET THE WIDTH TO 39.

The width prompt will include a default value. The is the default print width which may be set up by using the File Maintenance module (option #6 from the D B MASTER Main Menu). If you have not entered a default print width, the default will be 79, which is the default set up by the program. (We use 79 because some 80 column printers will skip an extra line if you go all the way to 80 characters.) Enter the appropriate width and press RETURN.

2. Comment Lines & Footnotes

Next you will be able to enter your comment lines. As the diagram on your screen will indicate, comment lines may be printed near the top of each page (under the date, report title and page number), or as footnotes, appearing as the last line or lines at the bottom of the page. You may elect not to use comment lines, or you may enter as many as nine of them.

The same comment lines and footnotes will appear on every page of your report.

Comment lines and footnotes are entered together. Top of page comments should be entered first, followed immediately by the lines you wish to appear at the bottom. When you have entered all of your comments lines, you will then be asked "# Comment Lines at Top of Page?" Enter the proper number, and any remaining lines will be printed as footnotes.

Comment lines are single spaced and are normally centered on the page. To double space, enter extra comment lines with nothing on them wherever you would like a blank line.

If you do not wish to have a line centered, enter a "@" (the Shift/P character) immediately following the last character to be printed on the line. The program will remove the "@" and begin the line at the left margin.

Since your report may be as wide as 132 columns, and the Apple screen will only display 40, we have created a system for entering your comment and column title lines in sections of up to 33 characters at a time.

Think of your screen as a movable "window" onto a page of the same width as your report. The window will show you all 9 of the lines available for comments and footnotes, but only 33 characters of the nine lines can be seen through the window at one time.

To enter a comment line, simply type over the underlined field on your screen. When you get to the end of the screen, press the RETURN key. The window will now show you the second 33 character segment of the page. The arrow which pointed to the first character position on the previous segment is now replaced by the last six characters that you typed before you pressed RETURN (characters 28 through 33). That way you will be sure to know where you were in your typing. (See the accompanying diagram.)

To leave a blank comment line (for double spacing, etc.), simply press RETURN once for each segment of the line.

Note that immediately below the window (near the middle of your screen) are two numbers indicating the character positions of the first and last characters in the window. For instance, the second segment will include the numbers 34 and 66 (assuming that your report width is at least 66).

The last segment of the line may be shorter than 33 characters, depending on the report width that you set earlier. The program will show you where to stop, and will not let you go over the edge.

After entering each line, you will be asked if you wish to enter another (unless you have already entered nine lines). After entering all of the lines that you need, say no, and the program willenter the editing mode.

You may now "scroll" the window horizontally through the segments of your comment lines by entering CTRL/N´s to go from one segment or "page" to the next. After the last page, the display will return to the first. You may now re-enter any of the lines by giving the program the number of the line you wish to change. If you wish to change a line, you must re-type that entire line.

When you are finished editing your comment lines, enter a "0" and the program will ask for the "# Comment Lines at Top of Page?" Tell the program how many of your comment lines you want printed at the top of the page. Any remaining lines will be printed as footnotes.

NOTE: it is important to design your report formats on paper before you enter them into the computer. Doing so can save quite a bit of time and aggravation.

3. Column Titles

Column titles are the headers that go over the actual columns of data on each page of your report. They are entered in the same way as your comment lines. You may use up to nine lines for column titles if necessary.

If you are going to have narrow fields on your report, you may find it helpful to build some or all of your titles vertically.

NOTE: If your report uses a "label" page format, comment lines and column titles will not be printed.

ENTERING COMMENT & TITLE LINES:

◄————— YOUR REPORT MAY BE AS WIDE AS 132 COLUMNS —————►

| DATE | REPORT TITLE | PAGE # |
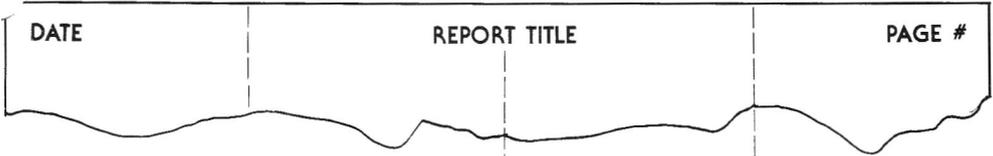
BUT THE APPLE'S SCREEN
WILL ONLY DISPLAY 40,
SO YOU ENTER COMMENT
AND TITLE LINES 33
CHARACTERS AT A TIME.

◄— 33 COLUMNS —►

IF YOU ARE NOT AT
THE LEFT EDGE OF
YOUR REPORT (CHAR-
ACTER POSITION 0),
THIS ARROW WILL BE
REPLACED BY THE
'AST 6 CHARACTERS
: THE PREVIOUS 33,
֌O YOU DON'T LOSE
YOUR PLACE.

◄——— 33 CHARACTERS ———►
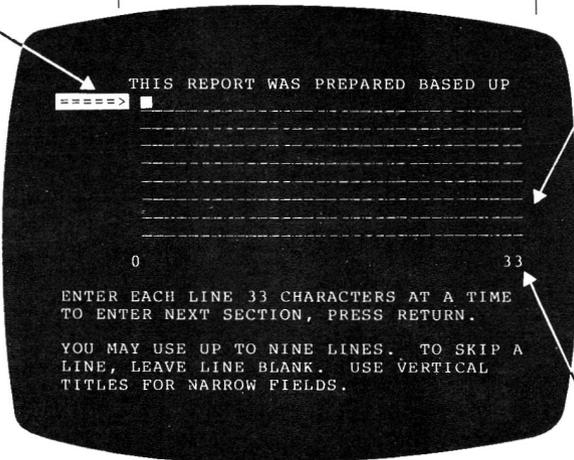
NINE LINES ARE
AVAILABLE.

```
        THIS REPORT WAS PREPARED BASED UP
=====> ■
       ----------------------------------
       ----------------------------------
       ----------------------------------
       ----------------------------------
       ----------------------------------
       ----------------------------------
       ----------------------------------
       ----------------------------------
       0                               33
ENTER EACH LINE 33 CHARACTERS AT A TIME
TO ENTER NEXT SECTION, PRESS RETURN.

YOU MAY USE UP TO NINE LINES.  TO SKIP A
LINE, LEAVE LINE BLANK.  USE VERTICAL
TITLES FOR NARROW FIELDS.
```

THESE NUMBERS WILL
SHOW WHICH 33 CHAR-
ACTER SECTION YOU
ARE LOOKING AT.

4. Computed Fields

D B MASTER lets you create computed fields for use in
your reports. You may add, subtract, multiply, divide or
exponentiate (raise a number to a power). Your
operators (the numbers that are used in the
computation) may be the contents of any two fields in a
record, or any one field and a constant (that is, a
fixed number).

Once you have set up a computed field, you may use the
contents of that field as an operator in other computed
fields. In this manner you can perform multi-step
calculations. Also, it is not necessary to print each
step in a calculation. Your computed fields are
independent of the fields that will actually be printed
on your report, so you may, if you so choose, only
print the last step of a chain of calculations.

Each report may use as many as 24 computed fields.

5. Creating Computed Fields

If you wish to create one or more computed fields, you
will have to know the numbers of the fields to be used
as operators. The program will show you a list of your
fields, along with their numbers, on your screen. If
there are more fields than will fit on the screen at
one time, you may "page" through the list by entering
CTRL/N for the Next page. After the last page of the
list, the display will return to the first page. You
may skim through these pages as often as you need
throughout the process of setting up your computed
fields.

Below the field list will be a small form with room to
enter the three or four requirements for each computed
field:

FIELD # (0=CONSTANT) ___ + - * / OR ^ __
FIELD # (OR 0) ___ CONSTANT _____

To create a computed field, enter the field number of
the first operator (or a "0" if the first operator is
to be a constant), followed by the operation sign and
the second field number.

If you have entered two field numbers, you may leave
the "Constant" field blank by pressing RETURN at that
field. However, if you have entered a "0" for either of
the field numbers, you must enter a constant to
complete the calculation.

Note that only Numeric and Dollar/Cents fields may be
used as operators in computed fields. The program will
check to be sure that you have entered legal field
numbers and an operation sign, that you haven't left
out a necessary constant, that you haven't tried to
divide by zero, and so forth.

As you enter each computed field, the program will
"make up" a name for that field based on the names of
the fields and the operations involved. For instance,
"Line of Credit" minus "Amount Due" would be called
"Line of - Amount," "Monthly Dues" multiplied by 1.15
would be labeled "Monthly * 1.15," and so forth. If one
of the operators in a field is another computed field,
its name will be in the form "C-201", with the number
being the field number of the operator.

The new computed field name will be added to the field
list on your screen, along with its own field number.
That number may now be used for one of the operators in
a new computed field.

If you make an error in creating a computed field,
simply enter another field with the proper information.
The only time when extra fields will cause a problem
will be if you reach the limit of 24 computed fields
per report. Remember that you will choose which of the
computed fields will actually appear on your report.

After you enter each computed field, the program will
ask if you want to add another. When you are finished,
answer "N", and the program will move on to the next
step.

IF THE RESULT OF A CALCULATION WILL NOT FIT IN ITS
ALLOTED SPACE, ONLY PART OF THE NUMBER WILL BE PRINTED,
ALONG WITH AN INDICATOR SHOWING THAT AN OVERFLOW HAS
OCCURED. See "Rules for Print Width: Justification &
Overflow" (below).

6. The Main Step:Determining Which Fields Will Be Printed In Your Report

This is the single most important step in creating a report format. It is here that you will tell D B MASTER which fields you actually want printed on your report, and how you want them to appear.

In this mode you may alternate between two different screen displays. The first is the same field list that was displayed while you set up your computed fields. Once again, entering a CTRL/N will display the Next page of the list.

The second display is similar to the "window" that is used when you enter comment lines and column titles. Again the window will show you segments or "pages" of your report format, 33 characters at a time. This time, however, your column titles (up to nine lines of them) will appear at the top of the screen, followed by a scale to show you where you are on your page. The following nine lines will show you the format of the first record to be printed in your report (see illustration). Use a CTRL/N to move the window to the Next portion of the display.

You may switch between the two displays whenever and as often as necessary while you are setting up your data fields. Enter a CTRL/D to change the Display.

7. Comment Fields, Subtotals & Record Numbering

D B MASTER will add some special field types to your field list. Let's look at them before we continue:

1. Comment Fields ("Add a Comment")

A Comment Field is a string of 1 to 15 characters which will be printed in the same position in each record that is included in your report. Comment fields may be used to add special punctuation (for instance: %, /, or $) or to add labels to data fields.

Comment fields will be printed at each subtotal break, and with the totals at the end of the report.

In some cases, Comment Fields may completely replace the column titles (see illustration). This can make reports with several lines of data for each record easier to read. To use this format, simply enter a descriptive Comment Field (often the field name from the form) to be displayed in front of the contents of each data field that you will print.

D B MASTER allows up to 20 comment fields per report. To enter a comment field, use the field number labeled "Add a Comment." Each time you add a comment, it will appear in the field list, and the number for Add a Comment will be increased by one.

You may choose any width from 1 to 15 characters for a comment field. The width will normally be equal to the number of spaces in the comment. If you do not enter a value, it will default to fifteen.

2. Horizontal Sub- and Grand Totals

D B MASTER maintains five independent Horizontal Subtotals and a Grand Total which is the sum of the subtotals. The term Horizontal refers to the fact that these totals are for adding the contents of numeric fields WITHIN a single record, as opposed to the vertical or column subtotals and totals which add the contents of the same field or column taken from all of the records in a report.

There are several rules to remember when using the horizontal totals:

a. All of the fields to be included in a subtotal must be printed before the subtotal.

b. Likewise, all of the subtotals that are in use must be printed before the grand total. These are two cases where the program cannot stop you from making error. IF YOU VIOLATE EITHER OF THESE RULES, YOUR PRINTED TOTALS WILL NOT BE CORRECT!!

c. You may not print a subtotal or grand total more than once. Note that this is not true of regular data fields, which may be printed more than once if necessary.

3. Record Numbering

You may have the records in your report numbered by the program. Record Numbering by Subtotal will zero the count and start over each time there is a subtotal break (see Subtotal Breaks, below). Record Numbering by Report will print a count from one to the total number of records in the report.

If you do not enter the width for a Record Numbering field, it will be set to a default of four.

8. How Your Print Fields Are Displayed

As you enter each field, it will be added to the diagram displayed at the center of your screen. This diagram will show an approximation of what each field will look like when printed on your report, as follows:

a. The horizontal tab (the spaces between fields, if any) will be represented by periods.

b. The number of the field within the report will be displayed, but only if the width of the field is greater than the width of the number. Note that this is the number of fields in the report, not the field number from the record. For instance, you may print horizontal subtotal #1 as the third field in your report by entering 245 for field number after entering the first two fields. However, the number displayed with the field on your screen will be a "3", since it would be the third field in the report. (This number will be used later on to identify fields that you wish to edit.)

c. The name of the field will be displayed next. If there is not enough room for the entire name (plus the number of the field, as mentioned above), the name will be shortened as necessary.

d. If the print width of the field is longer than the number of the field plus the name, any additional spaces will be represented by underlines (See illustration).

9. Setting Up Your Print Fields

D B MASTER will allow a substantial amount of
flexibility and editing when setting up the print
fields for your report. However, it is strongly
recommended that you use the Report Layout Forms
included with D B MASTER to design your reports before
you attempt to enter the formats into the computer.
Entering report formats can be time consuming, and it
can be frustrating to have to start over because you
left out a field, or put a field on the wrong line or
under the wrong title. It pays to plan ahead!

You may print up to nine lines of data for each record
in a report. You must enter all of the fields that you
want printed on one line, in order, before you go on to
the next line. When you have entered all of your data
lines, you will be able to edit your entries, changing
field numbers, lengths and tabs, but NOT the NUMBER OF
FIELDS ON A LINE OR THE NUMBER OF LINES.

To add a field to your report, enter a number from the
field list in the space labeled "Field Number." (If the
list is not displayed on your screen, enter a CTRL/D to
Display the list.)

Next enter a value for Tab Advance. This value is the
number of spaces to be left between the end of the
previous field (or the left edge of the page if this is
the first field on the line) and the beginning of this
new field. If you leave the Tab Advance space blank, no
spaces will be left between these records. The Tab
Advance must be in the range 0 to 99.

Then enter the Print Width. This is the number of
characters or spaces which will be allowed for the
printing of the data from your records.

10. Rules for Print Width:

a. Justification & Overflow

Numeric and Dollar/Cents fields will be printed right
justified on your report. That is, the right-most
digits and the decimal points of all of the figures in
a column will be lined up properly.

SETTING UP YOUR PRINT FIELDS:

YOUR COLUMN TITLES
WILL APPEAR HERE

A "DIAGRAM" OF
ONE RECORD'S
PRINTOUT WILL
APPEAR HERE AS
YOU ADD YOUR
FIELDS. —————

TAB ADVANCE

FIELD NAME

ADDITIONAL
FIELD
LENGTH

DYNAMIC PROMPTING™
AND INPUT FORM

```
C T   STORE NAME              CONTACT
O I
L T   ADDRESS
U L   CITY                    STATE
M E   PHONE #                 AMOUNT D
N S

      0123456789012345678901234567890123

D L   1STORE NAME_____.....2CONTACT
A I
T N
A E
  S

========================================
FIELD NUMBER (0 IF DONE)
TAB ADVANCE (0-99)    PRINT WIDTH
CTRL:  /N=>NEXT PAGE, /D=>DISPLAY FIELDS
```

In the event of field overflow (that is, if a number will not fit into the space alloted for it), the right-most digits will be printed, and the first or left-most digit that will fit in the alloted space will be replaced by an asterisk ("*") to warn you that the number is not complete. If the overflow value is a negative number, THE MINUS SIGN ("-") WILL NOT BE PRINTED.

b. Scientific Notation

Applesoft Basic will convert any numbers with more than nine significant digits to "scientific notation". This means that the number will be in the form: 1.23456789E+3. (For more information see your Applesoft Basic Programming Reference Manual.)

If a column subtotal, total or computed field is returned by Applesoft in scientific notation, D B MASTER will only print the number if the field width has been set to 15 or more spaces. Otherwise, only asterisks ("***") will be printed. Therefore, IF YOU EXPECT ANY OF YOUR FIGURES TO BE VERY LARGE (or very small), SET THE WIDTH FOR THOSE COLUMNS TO 15.

c. Non-Numeric Fields

All other fields (Alphanumeric, Phone Number, Date, etc.) will be left justified. In other words, the first character of the field contents will appear in the left-most position in the field on the report. If the field contents are too long for the print width, the right-most characters will be cut off.

For instance, if you allow 15 characters for a City field, San Francisco will print as San Francisco plus 2 additional spaces. But if you allow only 10 spaces for City, it will appear as "San Franci".

d. If a dollar/cents field is preceded by two or more tab spaces, the last tab space will be replaced by a dollar sign when subtotals and totals are printed.

e. Default Print Widths

If you leave the Print Width space empty, the following rules will determine the default print width that will be allowed for the current field:

*** Alphanumeric fields will be set to the width of the field in your file (same as the field length on your form).

*** Phone Number, Social Security and Date fields will be set to their proper lengths - 12, 11 and 8 respectively.

*** Yes/No fields will be set to 1 character.

*** Comment fields will be set to their maximum legal length of 15.

*** Record Numbering will use 4 spaces.

*** All other fields (Numeric, Dollar/Cents and Horizontal Sub- and Grand Totals) will be set to eleven (Applesoft's maximum of nine significant digits, plus room for decimal point and minus sign). REMEMBER TO SET THE WIDTH OF THESE FIELDS TO 15 CHARACTERS IF YOU EXPECT RESULTS IN SCIENTIFIC NOTATION (see Scientific Notation, above).

11. Code Fields

Each time you add a short (5 characters or less) Alphanumeric, or any Numeric (except Dollar/Cents) field to your report, the program will ask if you want to "Print Long Code Descriptions?" This refers to the code or "table look-up" values that may be set up by entering the "File Maintenance" module from the Main Menu.

Code fields allow you to store short codes, thus saving data entry time and storage space. You may then assign descriptions (up to 30 characters long) to each code value. When you print your reports, you may choose to print either the short codes or the full descriptions. If the program encounters a code for which you have not entered a long description, the short code will be printed instead.

For example, in most cases you would only store two
characters in a "State" field. But if you assign code
descriptions to each state's abbreviation, you could
automatically print the full state name in your
reports. Note that this will also let you enter an
abbreviation for a foreign country into a state field
(as long as it is not the same as one of the state
abbreviations), and print the full country name on a
report or mailing label. If you entered long
descriptions only for the country names, and not the
states, you could print the country name even though
for the regular state names you are still printing the
two letter codes.

For complete details, see Code Field Descriptions under
File Maintenance.

IF YOU PLAN TO PRINT LONG CODE DESCRIPTIONS, BE SURE TO
ENTER A PRINT WIDTH ADEQUATE TO ACCOMODATE THEM.

12. Other Numeric Field Options

If you have entered the number for a numeric field,
three additional questions will be asked:

1. "Horiz. Subtotal (0 or 1-5)." This refers to the
Horizontal Subtotals discussed earlier. By entering a
number from 1 to 5, you may add the contents of this
field to one of the five subtotals. If you enter a "0"
(or leave the space blank), this field will not be
included in the subtotals or grand total.

2. "# of Digits to Right of Decimal Pt." This figure
will be used in formatting the print-out of this field.
Numbers are always printed right justified, and
trailing zeros will be added if necessary so that your
decimal points (or the "ones" place if you enter zero
or leave this figure blank) will line up in a vertical
column.

3. "Print Column Subtotals & Totals?" If you enter a
"Y" here, subtotals will be kept for the values in this
column, and printed at each subtotal break (for
information on subtotal breaks, see The Sort Subformat,
below). A grand total will also be printed at the end
of the report.

13. Comment Fields

If you have requested a comment field, the program will ask you to type in the comment that you want to appear on the report. The field length that you requested (or 15 spaces if you entered anything larger or left the space for Width blank) will be displayed. Enter your comment and press RETURN. Whatever you enter will then be included on the field list. Note that the program will not accept the number of this new comment as the field number for a later field. Comment fields can only be added by using the number for "Add a Comment."

Each time you finish entering a field, the program will check to see that you have not gone beyond the report width which you established earlier. If you have gone over, the program will "beep" and say "Too Long For Report Width! Want to Make it Shorter?" If you say "Y", the program will let you re-enter the last field. Otherwise, it will assume that you are finished with the data line that you have been working on.

If you enter a "0" for Field Number, the program will ask "Add Another Data Line?" If you answer "Y", you can enter the fields to be printed on the next line.

To leave a blank line between two data lines WITHIN a record on your report (as opposed to the spacing BETWEEN records, which would be set up in the Page sub-format), ask for another data line, then enter a "0" for the first field number, effectively leaving that line blank. Then go on to your next line.

14. Editing Your Data Lines

When you have finished entering the fields to be printed on all of your data lines, the program will go into an editing mode. You may then change any of the information regarding any of the fields you have entered. You may NOT change the number of fields on any data line, or the number of data lines to be printed.

As described earlier, each field is displayed on your screen along with its sequential number within the report. (Some very short fields may not be numbered. Their numbers may be inferred by checking the fields immediately preceding or following.)

To change a field, enter its number for "Enter # to Edit." You will then be taken through the process of re-defining the field, with your original information supplied as default values. Thus, for instance, if you only want to change a field's Tab Advance, you will only have to re-enter that one number. For the other questions, just press RETURN.

When you have finished editing your data lines, the Data Sub-format will be complete. Enter a name for the format, and the program will then move on to the Sort Sub-format.

15. The Standard Data Format

As mentioned earlier, D B MASTER will automatically build one set of report formats for you when you create each file. The standard data format will print as many of your fields as will fit on up to 9 lines of 79 characters per line. The format will be called "All Fields" if the entire record fits, or "First __ Fields" if all of the fields cannot be included.

The format will set all tabs to 3 (i.e., 3 spaces between fields). All numeric fields will be printed as integers - no digits to the right of the decimal point. All field widths will be set to the width on the file's form. Whenever a complete field will not fit on a line, it will be moved down to the beginning of the next line.

Tutorial - Part 7 - Data Formats

From the "Choose Data Format" menu, enter a "0" to set up a new data format.

The first requirement for the data format is to know the width (in number of characters per line) for your new report. The default will be 7.9, unless you have set up your own default by using the File Maintenance module. As noted on the screen, the usual width for a screen report is 39, so enter that number here.

Next the program will ask if you want comment lines on your report. Answer "Y". You will then see the "window" that was discussed earlier for entering your comment lines. Enter "THIS TELEPHONE NUMBER LIST WAS PREPARED BY MY APPLE II & D B MASTER" as your comment lines. You will have to press RETURN half way through the word PREPARED, in order to move the window to the next segment of the line. (Note how the beginning of the word is displayed next to the window, so you will know where the break came.)

Since the comment will not fit on a single 39 character line, press RETURN again at the end of the word PREPARED, and tell the program that you do wish to add another comment line. Finish entering the comment. (This time you will need to press RETURN twice, since the remainder of the comment will not fill the first window.) Tell the program that you don't need another comment line, and follow the directions on the screen if you need to edit either of the lines you have entered. (If you request to edit a line, you will have to re-type that entire line.)

When the program asks "# COMMENT LINES AT TOP OF PAGE?" you may enter a 2 to print these lines at the top of the page, or a 0 to print them as footnotes. (You could also enter a 1 to split them up, but that would not make sense with these two lines.)

Next enter a column title line. Type in "NAME" at the beginning of the line (or "CUSTOMER NAME" or "CLIENT NAME", depending on how you are using your file). Then, using the space bar and the scale displayed above the window, move the cursor to the 26th position, and type "TELEPHONE #". Again you will have to press RETURN to move the window over to complete the line. Only the one

title line will be needed for this report.

You will not need computed fields for this report, so answer "N" to move on to the next step.

The first field we want to print on this report is Last Name, which is field number one on the field list on your screen. So enter a "1"'for Field Number. We want to print the name at the left margin, so enter a "0" for Tab (or leave the Tab space empty, which has the same effect). Finally, we want to print the full last name from your file, so you may also leave the Length space empty, and the program will default to the field length in the file, which is 20.

The display will now show you the column titles and the print fields that you have set up so far. To get back to the field list, enter a CTRL/D (for Display).

For the second field, let's print the first letter of the first name. Enter a "2" for field number, a Tab of "1", and a length of "1".

Finally, to print the Phone # field, enter field number "4". This time enter a "3" for the Tab, and again leave the length space empty.

Since these are the only fields we need for this report, enter a "0" for field number and leave the other two fields empty, and the program will ask if you want another data line. Answer "N".

You will now have an opportunity to edit the print fields which you set up. Note that since the second field is only one character wide, it is not displayed with a number. In such a case you must determine the edit number by looking at the adjacent fields. (The fields are always numbered sequentially, and these numbers have nothing to do with the numbers on the field list - they are simply the order in which the fields will appear on the report.)

When you are finished with your edits (if any), give your new data format a name, and the program will move on to the sort format.

CHAPTER 4 - THE SORT SUB-FORMAT

D B MASTER can "sort" your records in alphabetic or numeric order based on the contents of any of the fields in your file (but not computed fields), or on a combination of as many as six fields. The information required to perform a sort is stored in the Sort Sub-format.

(As with the other sub-formats, there will be a list and menu from which you may choose an existing format to use, replace or print out, or to create an entirely new format.)

When you create a new Sort Sub-format, a list of the fields in your file will appear on your screen. As before, you may enter a CTRL/N to display the Next page of the list. Below the list will be a prompt asking for the number of a field to use for your sort.

1. Temporary Print (Sort) Files

You will recall from our discussion of the ISAM filing system used by D B MASTER that your records are already sorted and stored in primary key order. So obviously the fastest way to run a report is to print it in primary key order (no sort required). To print your report in this way, choose the standard sort format included by the program, which is called "File Order." (Or create a "null" sort format - that is, one with no sort fields at all.)

When you run a report in primary key order, the records are taken from the master data diskettes, and the appropriate fields are sent directly to your printer (or to the screen).

NO TEMPORARY FILE IS NECESSARY WHEN PRINTING A REPORT IN PRIMARY KEY ORDER.

If you run a report in any other order, the progam must build a "temporary print file" before it can print the report. THE TEMPORARY FILE REQUIRES A BLANK DISKETTE (or one that can be erased). If your report will include most of the records and fields from a large, multi-diskette file, it is suggested that you separate the report into two or more logical segments. Otherwise, if your temporary file grows beyond a single diskette, you will have to do a substantial amount of "disk swapping" to build the temporary file.

In building a temporary file, D B MASTER will use your Select format to choose which records are to be printed. It will then create a record in the temporary file which holds only those fields from the selected records which are to be printed on the report. The temporary file does not have to store computed fields, comment fields, record numbers, etc. That is, it only holds those fields which are actually contained in your file's records, and which are to be included in the report. Note that it will include fields from the file which are used as operators in computed fields, even if the operator itself will not be printed.

2. Estimating the Size of a Sort File

NOTE: If your files do not go beyond a single master (data) diskette per file, you may skip this section.

If you are printing a report based on a multi-diskette file (ie, one in which you have filled more than one Master diskette, not counting your Utility diskette), it is wise to estimate the size of your temporary file before starting. To do so, first estimate the number of bytes for each record to be printed. This will be the sum total of the lengths of all of the fields to be included in the report (including any fields which will be used as operators in computed fields but will not be printed themselves). Remember that numeric fields are stored in 1, 2 or 5 bytes, dollar/cents fields take 5 bytes, and all other fields require one byte of storage for each character allowed in the field (including the dashes in Date, Phone # and SS# fields).

If many of your records have empty spaces in some of the fields to be printed, you may assume a 10% or 20% (or more, if you are printing a lot of partly filled fields) "packing" figure to allow for D B MASTER's

automatic data compaction feature. In other words, if
you will be printing a maximum of 100 bytes per record,
but that figure includes two or three alphanumeric
fields which are frequently half empty, you could
assume that you will actually be using about 80-90
bytes in the temporary file for each record.

The next step is to estimate the number of records that
will be included in the report. (The TOTAL number of
records in the file can be found by using the File
Statistics option in File Maintenance, or by entering
the Add Records mode.) Then multiply the number of
records to be included by the estimated number of bytes
per record as determined above.

A temporary file diskette will hold about 120,000
bytes. In general practice, however, it is suggested
that IF YOUR ESTIMATE IS GREATER THAN 100,000 BYTES,
YOU SHOULD SPLIT YOUR REPORT INTO TWO OR MORE SMALLER
PARTS. This will normally be done by using different
Select criteria. For instance, you could divide your
report by sex, zip code ranges, territories, ranges of
dates, segments of the alphabet, etc. See the Select
Sub-Format, below.

3. Entering Sort Field Data

If you wish to print the records on your report in
other than the primary key sequence, you may now enter
the numbers for up to six sort fields.

D B MASTER will sort the file based on the contents of
the first field that you enter. That field is called the
"Major Sort" field. If there are two or more records
with the same contents in that field, they will be
sorted into the order of the second sort field, and so
forth.

For example, you might sort a mailing list first by
State (the major sort), then by City, and finally by
Age. That way all of the eighteen year olds in the same
city will be grouped together, followed by all of the
nineteen year olds in the same city. When everyone from
one city has been printed, the report will go on to the
rest of the cities in that state, then on to the other
states.

On the other hand, if Age is the major sort, followed by State and City, all eighteen year olds from the entire report would be grouped together. Within the grouping they would be sorted by state, then by city. After the eighteen year olds would be similar groups of nineteen and twenty year olds, and so on.

4. Subtotal Break Fields

If one of your sort fields will have several records with each value, you may find it useful to "subtotal break" on the contents of that field. That means that every time the contents of that field changes, the program will stop and print subtotals for all of your column total fields before printing the records with the next value in that field.

For instance, imagine that you have a file of wholesale customers. Each record includes the name of the customer, the sales rep that they deal with, and the customer's gross purchases for the current year. If you sort the file by sales rep and also subtotal break on that field, the report will print all of the first rep's customers, then break and print that rep's total sales for the year to date (the total of the gross purchases of all of that rep's customers). The same process will be repeated for the next rep, and so forth. At the end of the report, the total of all of the subtotals, i.e. the grand total of all of the reps' sales for the year, will be printed.

After you have set up your sort the program will ask how many of the sort fields you want to subtotal break on. Note that in order to subtotal break on, for instance, your third sort field, you must also break on the first two fields. There is a good reason for this restriction. Imagine that you have sorted a file by state, and then by city, and that you wanted to subtotal break on the city field only. What would happen if the last city listed under one state had the same name as the first city listed under the next state? The break would not come until all of the records for both of the cities with the same name had been printed, and your subtotal would include the results from both cities! By insuring that you always break on all fields UP TO AND INCLUDING the last sort field that you wish to break on, D B MASTER helps you avoid that kind of confusion.

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5. Page Breaks

You may also ask D B MASTER to automatically begin a new page whenever a subtotal break occurs on certain fields. If you are using continuous form paper, your printer will skip to the top of the next page as soon as the subtotal information has been printed. Otherwise the printer will stop after the subtotals and the program will prompt you to insert another sheet of paper.

The same restriction that applied to subtotal breaks also applies to page breaks (for the same reason). In order to page break on the second sort field, for example, you must also break on the first, and so on. Also, you can only page break on fields that you also subtotal break on.

Note that it is not necessary to include a field that you will use as a page break field, as a printed field on your report. The name of the field and the new field content that is generating each page break (the rep's name or number in the example above) will be printed at the top of each page. And since the contents of the field will be the same for all of the fields within that subtotal/page break grouping, printing the field in each record would be redundant.

If you have assigned a long code description to the contents of the page break field, both the actual (short) field contents and the long code description will be printed at the top of each page. This occurs automatically - there is no need to request it.

CHAPTER 5 - THE SELECT SUB-FORMAT and the MASTER REPORT FORMAT

So far we have discussed the Page and Data sub-formats, which determine which parts of your records will be printed and how the report will look, and the Sort sub-format, which determines the order in which the records will be printed. Now we have come to the final step in setting up a report - the Select sub-format. This is the sub-format which determines WHICH of the records from your file will be included in your report.

Once again, a menu will allow you to use an earlier Select format or to create a new one.

1. Selecting Which Records to Print

The procedure for selecting records for inclusion in a report is identical to the procedure for selecting records for screen display (see Search Criteria Defined and Entering Search Criteria, above).

The same form which you have used in searching for records will appear on your screen. You may then enter as many as twenty criteria for the program to use in choosing the records for your report. (Each Range criteria counts as two of the twenty.)

You may use any of the search types in setting up your selection, including "OR's".

To print the entire file, enter a CTRL/S to Save the format without entering criteria into any of the fields. Or simply use the standard Select format created by the program, which is called "All Records."

2. More on Sort Files

If you are not printing your report in primary key order, and if you have more than one diskette of records in your file, you should try to break up the

report in some way so that your Temporary Print File will not become too large. (See Temporary Print Files.) For example, you might separate a large file by age groups, product categories, geographical locations, etc. to produce two or more logically organized reports, none of which would require more than one diskette of temporary file.

IF A TEMPORARY PRINT FILE GROWS BEYOND A SINGLE DISKETTE, YOU WILL HAVE TO DO A GREAT DEAL OF DISK "SWAPPING." NOTE THAT THIS WILL NEVER BE A PROBLEM IF YOU PRINT YOUR REPORTS IN PRIMARY KEY SEQUENCE.

When you have named your Select sub-format, you are nearly finished. All that remains is to tie the four sub-formats into a single Master Report Format.

3. The Master Report Format

The four sub-formats which you have now chosen or created will be treated by D B MASTER as a single Master Report Format (the individual sub-formats will also be available for inclusion in other Master Report Formats at a later date).

The program will now ask if you wish to store this Master Report Format for repeated use. If you do, you will be asked for a name for the Master Format. Try to use a descriptive name which will remind you of the contents of the format when you see it in a list of formats in the future. The next time you want to use this report format, you will not have to re-do any of the procedure that we have just finished describing. You will simply tell the program which previously created Master Report Format you wish to use, and the computer will take care of the rest!

Finally, you may enter a title for your report. If you are storing the master format for repeated use, the master format name will become the default for the report title, since they will frequently be the same. Press RETURN to accept the default, or type in a different title.

IF YOU ARE SETTING UP A LABEL FORMAT, DO NOT INCLUDE A REPORT TITLE! If there is a default displayed for the title, press the SPACE bar once to wipe out the default, then press RETURN.

At this point you will have completely defined a D B MASTER report. If this is a temporary master format, the program will go directly to the report writer, which is the module that actually prints your reports. If, on the other hand, you will be storing the master format, you may go to the report writer, or return to the Main Menu and print your report at a later date. The program will ask "Print This Report Now?" To return to the Main Menu, simply answer "N".

4. Tutorial - Part 8 - Sort & Select Formats

You will probably want your phone list printed out in alphabetic order, and since the primary key begins with last name, no sort will be necessary. So when the "Choose Sort Format" menu appears, enter a "1" to use the "File Order" format built by the program.

Since you chose an existing format, the next menu will give you an opportunity to print out the specifications of the format, pick a different format, replace that format, or move on to the next section of the program. Enter a "4" to move on.

The Select format is the one where you must fend for yourself, since we have no way of knowing the contents of your records. If you enter a "1" ("All Records"), the standard format will cause all of the records in your file to be included in the report. If you enter a "0", you may set up whatever selection criteria you desire, using the same procedure that you use when searching for records for screen display.

Once you have set up or chosen the four sub-formats, the program will ask if you wish to store the master format, which is the combination of those four sub-formats. Say "Y", and give the master format a name. That name will then be offered as a default for the title which will be printed on the report. You may accept the default by pressing RETURN, or enter a different title by typing it in.

Finally, you may choose to print your new report right away, or to return to the Main Menu. (If you choose not to store the master format, the program will assume that you wish to print the report immediately, and this choice will not be offered.)

CHAPTER 6 - PRINTING A REPORT

There are two ways to get to the module which actually prints D B MASTER's reports: one is by setting up a new report format and telling the system that you wish to print the new report right away, and the other is from the Main Menu, by entering a "5" ("Set Up or Print Report") and answering "N" to the question "Create New Report?"

If you have come from setting up a new format, the program will proceed to set up and print that report. Otherwise, you will be shown a list of the master report formats that have already been created for the file you are working with, and you may choose the one you wish to print. Note that the first format listed, called "Print All Records", is put there by the program, and includes the four standard sub-formats which D B MASTER sets up when it builds each file. (See the sections on the individual sub-formats.)

The directions on your screen will prompt you for the various diskettes needed by the program. Remember that if you are printing a report which is to be sorted, the system will have to build a temporary print file, so you should always have an extra diskette or two available. If you have a very large file, building the temporary file can take a half hour or more. The flashing cursor on your screen will assure you that the program is still working (it will also turn the disk drives on frequently as it builds the file), and the number at the center of your screen will tell you how many of your records have been included in the report thus far.

The program will ask you to confirm the date to be printed on your report. You may either press RETURN to accept the date as displayed on the screen, or press the ESCape key to enter a different date. This date may be entered in any format, so styles such as "30-NOV-80" are acceptable. The maximum length for the date input is nine characters.

****REPORT GENERATOR MODIFICATION****

Please note the following change:

D B MASTER WILL SKIP A LINE BEFORE PRINTING THE
FIRST PAGE OF ANY REPORT

PLEASE ADJUST YOUR PAPER OR LABELS IN YOUR
PRINTER ACCORDINGLY

Reports created by previous versions of D B
MASTER will be effected--the first line on the
first page of ALL reports will be skipped BEFORE
printing begins

KEEP THIS IN MIND WHEN YOU ARE READY TO PRINT

CHANGING REPORT PARAMETERS

When your report is ready to print, a display will appear on your screen. You may now change most of the parameters which are set up both in the Page sub-format and in the Printer Parameters section of File Maintenance, plus a few extra features, as follows:

(1) PRINTER SLOT # (0=SCREEN)
(2) SUMMARY ONLY
(3) FORM FEED
(4) LINE FEED
(5) INTERFACE TYPE
(6) SPACES BETWEEN RECORDS
(7) PRINT LINES/PAGE
(8) TOTAL LINES/PAGE
(9) STOP BETWEEN PAGES
(10) STATISTICS
(11) COMMAS

Those parameters which are normally set in File Maintenance or the Page format will default to the values set there. Summary Only, Statistics, and Commas will all default to "No". To change any of the Yes/No parameters, simply enter its number. Each time a parameter's number is entered, it will "toggle" back and forth between Yes and No. To change any of the other parameters, enter its number, and the program will ask for a new value. You may make as many changes as necessary before printing your report.

If you stop your report before it is finished (by pressing "ESC"), or after the report has been completed, the program will ask if you wish to begin that report again. If you say "Yes", the program will return to the Change Parameters display. You may then make whatever changes are necessary (if any), and begin again. This process may be repeated as often as needed.

STATISTICAL INFORMATION IN REPORTS

Statistical information is available in the report generator. To get the Count, you must use "Record Numbering by Report" or "Record Numbering by Subtotal Break" . The Sum is the same as a column total. To get the Average and Standard Deviation for those fields which you are totaling, turn on the "Statistics" function before printing the report. This means that your existing reports can be printed with statistics without having to recreate them.

The statistics will be printed at each break where column totals appear. You MUST have requested column totals on a field in order to get statistics for that field.

Statistics may also be included in screen and summary only reports.

FORMATTING NUMBERS WITH COMMAS

Large numbers are much easier to read if they are printed with the standard commas between every three digits to the left of the decimal point. Any report may include commas by simply turning on the Commas function.

When the Commas are turned on, they will be printed based on the following rules:

1. With commas turned on all numeric, computed, sub and grand total and dollar/cents fields will be printed with commas, where possible.

2. If the entire number will not fit in the print width assigned an attempt will be made to print the number without the commas.

3. If the number still does not fit, an asterisk ("*") will be printed at the left-most position of the field followed by as much of the right-hand portion of the number as will fit.

4. If the number has gone into exponential ("scientific") notation, it will only be printed if the print width of the field is at least 15 characters. Otherwise, all asterisks will be printed in that field.

Additional space is required to print commas so the default print width for numeric fields in the Data sub-format has been increased from 11 to 15. If you do not enter a field width when adding a field to a report format the width will be set to 15 characters.

CHANGING THE DATA SUB-FORMAT

Existing Data Sub-Formats may be changed on a section by section basis. This means that you can replace just the comment and titles lines, leaving the actual data fields as they were, or vice versa.

To edit a Data sub-format, enter the report design process by entering a "5" from the Main Menu, then responding that you wish to create a new report format.

After choosing or designing a Page format, pick out the Data format that you wish to edit, then enter a "2" for "Replace This Format."

The first input required will be the width of the report. The width of the original format will appear as the default. IF YOU CHANGE THE WIDTH, YOU WILL HAVE TO RE-ENTER THE ENTIRE FORMAT. To edit the format, simply press return to keep the original report width.

You will now be asked if you wish to change your comment or title lines. The comment and titles lines are treated as a single element - if you wish to make any changes in them, you will have to re-enter them in their entirety.

If you answer "N", the program will move on to the computed fields. If you answer "Y", you will next be asked whether you want comment lines, and so forth, as in the original design process. Your new comment and title lines will replace those in the original Data format.

Next the program will ask if you wish to change your computed fields. IF YOU CHANGE COMPUTED FIELDS, YOU WILL ALSO HAVE TO RE-ENTER YOUR DATA FIELDS! If you answer "Y", you may then re-enter the computed fields for your report.

Finally, you will be asked if you wish to change you data fields. As with the other segments of th format, if you wish to change any of the data fields you will have to re-enter all of them. The procedur is identical to the original design process.

If you do not need to change the data fields, or whe you have finished re-entering them, you will be aske for a name for the data format. The format which yc originally choose to work with will now be replace with the modified format and its new name.

DELETING MASTER REPORT FORMATS

Enter the Report Generator's report format list (from the Main Menu enter a "5" and reply "NO" to the prompt). The list of your file's report formats will appear on the screen. Choose a format and the option to delete that format will appear in the Dynamic Prompting. To delete the format, enter a CTRL/D, and type "YES" to the confirmation question. Once a master format has been deleted, it cannot be recovered. All the sub-formats included in that master format (Page, Data, etc.) will NOT be deleted. Sub-formats can never be deleted - only REPLACED with new formats.

Deleted formats will leave "holes" in the numbering sequence that appears with the format list on the screen. New formats will NOT use the old numbers. Simply ignore the missing numbers.

CHANGING SELECT CRITERIA

Enter the Report Generator to print a previously defined report format (from the Main Menu enter a "5" and reply "NO" to the prompt). The list of the file's report formats will appear on screen. Once you have chosen a format, a number of options will appear in the Dynamic Prompting, including Control/S to change your Select format.

Enter a Control/S and the program will go directly to the module where you enter your Select criteria. Enter your new criteria, and a name for them. THE PROGRAM WILL THEN REPLACE THE SELECT SUB-FORMAT USED IN THE REPORT YOU ARE ABOUT TO PRINT WITH THE NEW SELECTION CRITERIA AND NAME THAT YOU HAVE JUST ENTERED. ANY OTHER REPORTS THAT USE THE SAME SELECT SUB-FORMAT WILL NOW BE BASED UPON THE NEW CRITERIA! This is the same process which occurs when you elect to Replace a sub-format.

The program will then return to the Report Generator, and immediately prepare your report for printing based upon your new Select criteria.

ESCAPING FROM THE REPORT SET-UP PROCESS

When you are designing a new report, a list of the existing formats will appear as you enter the module for each sub-format. The prompt at the bottom of the screen ("ESC =MENU") tells you that by pressing the "ESC" key at that time, you can return to the Main Menu. Whatever work you have completed up to that point will automatically be saved in the Utility file.

When the report is ready to print (and the temporary print file, if any, has been completed), a screen menu will give you three choices:

a. Print the report on the screen only. You may use this option to print screen reports, or to get a look at a regular report before it is sent to the printer.

b. Print the report on a printer connected to your default slot number. If you have not entered a slot number in the File Maintenance module, the default slot number will be #1.

c. Choose a different slot number. Use this option if you wish to use a different printer, send the report over a modem, etc.

1. Summary Only Reports

Finally the program will ask if you would like a normal or a summary only report. A summary only report includes everything BUT the records themselves: that is it will print the report title, comment, footnote and column title lines, subtotal and page breaks, and column sub and grand totals. But the records themselves, which normally constitute the body of a report, will not be printed. The purpose of a summary only report is to save printing time and paper when the only facts which you really need are the column subtotals and grandtotals. Any report format may be printed as a summary only report at some times, and as a regular report at other times.

2. Stopping & Starting Printout

If the page format being used by your report includes stopping between pages, the program will stop whenever it is necessary to put a fresh sheet of paper into the printer. This feature may also be used with screen reports to print a full screen page, then wait for a key press before printing the next page.

In addition, you may press the ESCape key to stop the report at any time (actually, it will finish printing the record that it is working on, then stop). If you do so, the program will give you the choice of starting the report over again (from the beginning), or returning to

the list of available master report formats, where you may choose a different report to run, or enter a "0" to return to the Main Menu. In starting the report over, you may again choose printer or screen, and summary only or regular reports.

There is also a Stop/Start feature that will let you press any key (except, of course, ESCape and RESET) to temporarily stop the printout, and then press a key for a second time to re-start the report from the point where you stopped it. This is useful when screen reports scroll off the screen, when the paper slips in your printer, or when the phone rings and you want to stop the printer temporarily.

When the report is finished, you may re-start it, choose another report to run, or return to the Main Menu. Note that any time you re-start a report you will have the choices mentioned above of screen or printer report, and normal or summary only report. So you could, for example, run a summary only report on your screen, then switch to your printer for a hard copy of the full report, and so forth, without returning to the list of available reports.

3. Tutorial – Part 9 – Mailing Labels

NOTE: Before beginning this section, it is suggested that you check the size of the labels you will be using. The easiest way to do this is take some text printed on the printer you will be using, hold one of your labels up against the text, and count the number of lines per label (from the top of one label to the top of the next), and the number of characters per line. When you count the number of characters per line, be sure to leave space for both left and right margins

Now let´s create a report format for producing mailing labels. This format will also show you how to set up a report that uses more than one data line per record, and that uses an alternate method of titling the fields printed on the report.

From the Main Menu, enter a "5", and tell the program that you wish to create a new report. When the "Choose Page Format" menu appears, enter a "0" to create a new format. This time, however, when the program asks if this is to be a label format, answer "Y".

A label page format only needs to know the number of blank lines that you need between records. This will usually be the total number of lines that will fit on one of your labels, less the number of lines that you plan to print on each one.

NOTE: Any report printed with a label page format will NOT print comment and footnote lines, column titles, page number, date, or report title, since any of those items would keep the program from formatting your labels properly.

The other page format parameters will default as follows:

Print Date — No
Print Page Numbers — No
Stop Printing Between Pages? — No
Lines Per Page — Print (label), Total (label)

When printing labels, the page length is set to an "infinite" page, so once you have the labels printing properly, they will just keep printing until you ask the program to stop, or it gets to the end of the selected records from your file.

Once again, enter a "0" from the "Choose Data Format" menu, so you can create a new data format.

This time, enter the width of your labels as the number of characters per line.

Answer "N" about using comment lines, column titles, and also about computed fields. For this format, you will only need the print fields themselves.

However, when you are using more than one print line per record, and you wish to use column titles, it can become difficult to tell which titles at the top of a column refer to a field on, for instance, the fifth data line. So in such a case we recommend that you use "comment fields" (as opposed to comment lines, which are completely different) to title the fields within each record, instead of at the top of the page. Although this type of field labeling would not normally be used on mailing labels, it is not completely inappropriate and will often be used in other labeling

applications, so we will include the technique here as a demonstration.

NOTE: The following example assumes a label width (and report width) of at least 35 characters. If you cannot fit that many characters per line on your labels, you will have to reduce the widths of some of the fields.

For your first print field number, enter "225", which is listed on the field list as "Add a Comment." Enter a tab of 0, and a length of 5.

The program will now let you enter a comment. Enter "NAME:", including the colon.

For the second field, enter "2" for field number, 1 for Tab, and 8 for field length. This will give you the first 8 characters of the first name.

The third field is Last Name (field #1), with a tab of 1 and length of 20.

There are no more fields on line one, so enter a "0" for field number, and leave the other two fields blank. Then tell the program that you DO wish to add another data line.

The second line also begins with a comment field. This time, however, you will notice that the field list has your first comment field as field number 225, and "Add a Comment" as number 226. So enter "226" for field number, and again leave the Tab space blank, and enter "5" for length.

This time enter "ADDR:" as the comment.

The only other field on line #2 is Address, with a tab of 1, and you can leave the Length field blank, so the field will default to its full length in the file.

Once again, line #3 begins with a comment field ("Add a Comment" is now number 227). Again use Tab = 0 and Length = 5. This time the comment is "CITY:".

Finally add the fields for City (Tab = 1, Length = 20), State (Tab = 1, Length = 2) and Zip Code (Tab = 1, Length = 5).

Since State and Zip Code are alphanumeric fields and
are less than 6 characters wide, the program will ask
if you wish to print long code descriptions for those
fields. Answer "N".

You have now set up all of the fields for your labels.
Enter a "0" for field number, and respond that you do
not wish to add another data line. You may then make
any changes necessary in the work that you have done.

You will note that the comment fields will act as field
labels or titles. The fact that they will be repeated
within each record will make the individual records
much easier to read. A report may include as many as 20
of these comment fields.

Finally, give your new data format a descriptive name,
and move on to the sort format.

This time let's assume that you would like your report
(labels) printed in zip code order, rather than file
order. So enter a "0" from the "Choose Sort Format"
menu.

Choose the field that you wish to sort on (Zip Code),
and enter the number for your first sort field. Since
that is the only field you will be sorting on this
time, enter a "0" for sort field number 2.

If you need to sort on more than one field, you must
remember to enter the "major" sort field first. The
major sort field will generally be the one with the
fewest possible values in the field - the most general
quality that you wish to sort on. Any additional sort
fields should then go in order, each field being
somewhat more specific than the preceeding field, so
that a field like Zip Code or Last Name would generally
be the last field to sort on.

Next the program will ask about subtotal and page
breaks. Since the field that you are sorting on will
probably have a lot of different values (i.e., your
file will contain a lot of different zip codes), and
since each zip code is only likely to have a small
number of occurances in the file, you should not break
on this field. Otherwise, most of your subtotal breaks
will only include one or two records - a waste of paper
and printing time. So enter "0" for the number of

subtotal breaks. Since you can only page break on subtotal break fields, the program will not ask about page breaks.

When you have named your sort format ("Sort by Zip" would be a good name), the program will move on to the select subformat. As before, you may choose to print all of your records, or to only include a selected portion of your file.

You may then choose to print your labels now, or return to the Main Menu.

PART III - FILE MAINTENANCE

To enter the File Maintenance module, enter a "6" from
the Main Menu. Note that the system will always ask you
to insert the program diskette when you ask for File
Maintenance, even if it is already mounted. This has
been provided as an entry point for utility programs
that work with D B MASTER, but will be released on
separate program diskettes. If your program disk is
already in the drive, simply press RETURN.

1. Reblocking Files (File Back-up)

The ISAM file structure used by D B MASTER builds data
BLOCKS. These blocks hold the records in your master
files and the formats, secondary keys, etc. in your
utility files. The blocks are of a fixed length: each
block takes up the same amount of storage space on a
diskette or in RAM. However, the amount of information
(number and size of records) held in each block is
variable. As you build your files, some blocks may be
nearly full, while others may have only one or two
records in them. In an ideal case, each data block
would be nearly filled, leaving only enough room to add
one or two additional records (or to expand several of
the existing records) without forcing the block to
split into two new data blocks, and possibly forcing
expansion to an additional volume (diskette).

In order to approach this ideal case, and thus to
provide for the most efficient possible storage of your
records, D B MASTER includes a utility for REBLOCKING
your files. When you reblock you create a new file
(including master and utility diskettes) whose data
blocks are filled to the most efficient size.

Reblocking achieves the following:

(1) Creates a new file with all of the data from your
original file stored in the most efficient possible
manner. If a file reaches D B MASTER's maximum

capacity, reblocking MAY allow a few more records to be added.

(2) Each time you reblock, your original diskettes become a backup copy for use in the event that the reblocked copy is lost, damaged, etc. Although D B MASTER data disks can be copied using most Apple diskette copy programs, this can be dangerous (see below). The recommended backup procedure is to reblock periodically, then to use the daily update printout feature described earlier for a record of changes made to your files between backups.

(3) In the event of a problem with one of your data disks (power loss while writing to the disk, accidental reset, etc.) reblocking can frequently recover most of the data from the file. This should ONLY be attempted if no backup disks are available, since you will have no way of knowing which records have been lost.

(4) The reblocked diskettes will have different DOS volume numbers than the originals, and will contain the new date.

(5) The value for the number of records in the file will be adjusted, if necessary. This number is only written out to your master diskette when you "Close Files & Exit" from the Main Menu, or in some cases when you go between the different modules of D B MASTER. Thus if you add a number of records, then turn the power off or otherwise "crash" the program without closing the files properly, the file may include the new records and be otherwise fine, but the figure for the number of records in the file may be incorrect. Reblocking will fix it.

Since the ISAM index for the reblocked files will be different than the index on the original diskettes, YOU MUST REBLOCK BOTH THE MASTER AND THE UTILITY DISKETTES when you reblock a file. D B MASTER will not let you use a utility diskette created on one date with a master diskette created on another date. (In addition, a random factor introduced into the diskette volume numbers will protect you even if you reblock a file twice on the same day, or on the day that the file is created.) Note that this is another reason for always using the correct date when you boot up D B MASTER!

How to Reblock a File

When you reblock a file, you must have a blank diskette available for each master AND utility diskette used by the existing file. In many cases, reblocking will compact the file enough to fit on fewer diskettes, however you cannot determine in advance whether this will happen. (Multi-volume files may, in rare cases, reblock onto one MORE diskette than the original file.)

To reblock a file, enter a "6" (File Maintenance) from the Main Menu, then enter a "1" (Reblock Files) from the File Maintenance Menu. The program will prompt you for the diskettes that it needs. REMEMBER THAT WHENEVER THE PROGRAM ASKS FOR A "NEW" FILE DISKETTE, THAT DISKETTE WILL BE INITIALIZED, AND ANY EXISTING INFORMATION ON IT WILL BE LOST!

NOTE THAT ALL D B MASTER DATA DISKETTES SHOULD BE LABELED WITH THE WORD "MASTER" OR "UTILITY", THE FILE NAME, THE DISKETTE VOLUME NUMBER, AND THE DATE THAT THAT COPY OF THE FILE WAS CREATED. All of this information may be found by booting a normal DOS diskette, then inserting your data diskette and typing "CATALOG" and pressing RETURN. REMEMBER TO USE THE VOLUME NUMBER DISPLAYED IN INVERSE VIDEO (which will be less than or equal to the number of diskettes in the file) AND NOT THE STANDARD DOS DISKETTE NUMBER DISPLAYED ABOVE IN STANDARD VIDEO. The standard DOS volume number is used internally by the program, and will usually be a much higher number.

This is what the DOS catalog looks like (the underlined parts will be in inverse video):

DISK VOLUME 125

```
* R 000 STORE FILE          110180
* R 000 VOLUME: 1 15K        DB: 15
```

For a Utility volume, the first line might read:

```
* R 000 UTILITY  STORE FIL 110180
```

Or for a temporary sort file (for a report):

```
* R 000 SORT                110180
```

When the reblocking has been completed, remove your new diskettes and label them. It is also wise to note on the original diskettes the fact that that file has been reblocked, and the date.

D B MASTER will then re-start itself, and you can open your newly reblocked file and begin working with it.

2. File Statistics

The File Statistics option (#2 on the File Maintenance Menu) will tell you the number of records in your file. In addition, it will list the file's fields, giving field name, type and length for each field. It will also tell you which fields are in your primary key, and which have secondary keys associated with them.

The file statistics may be displayed on the screen or sent to a printer by following the directions on your screen.

3. Adding & Deleting Secondary Keys

D B MASTER will allow you to add or delete secondary keys for any of the fields in your files, even after you have entered a number of records into the file.

To add or delete secondary keys, enter a "3" (Add/Delete Secondary Keys) from the File Maintenance Menu. A second menu will give you the choice of adding or deleting keys, after which a numbered list of the fields in your file will appear on the screen. If all of your fields do not fit on the screen, you may enter a Control/N to see the Next page of the list.

Once you have chosen the field to work with, simply follow the prompts on your screen. NOTE THAT IF YOU ARE ADDING SECONDARY KEYS, THE PROGRAM WILL FIRST DELETE ANY SECONDARY KEYS FOR THAT FIELD (the attempt will be made even if there are none), THEN IT WILL BUILD A FRESH SET OF KEYS.

If you are adding keys, your utility file may require an additional diskette, so you should always have one available for that purpose.

In rare cases involving very large files, it is possible to reach D B MASTER's maximum capacity while building secondary keys. In that event, the next time that you go to add or search for records, the program will be unable to open the master file, and it will stop and tell you that you have a file problem. What you must do is re-start the program, go directly to File Maintenance, and delete at least one of your secondary keys. Your file should then work properly.

Note that by deleting existing secondary keys it is possible to increase the number of records that can be stored in a file. Thus if you reach D B MASTER's capacity with a file which already has one or more secondary keys, deleting secondary keys from one of your fields will enable you to add more records.

4. Code Field Descriptions

D B MASTER allows you to store short codes in numeric (except for dollar/cents) or short alphanumeric fields, then print "long code descriptions" in place of the short codes on your reports. Code fields may be added, changed or dropped at any time - they are not defined when you create your file. You may use any or all of the eligible fields in your file as code fields.

(For the uses of long code descriptions, see "Code Fields" under "The Data Sub-Format", above.)

To set up or modify code descriptions, enter a "4" from the File Maintenance Menu. A list of the fields in your file will appear on the screen. Choose the field you wish to work with. The program will only let you choose fields that are allowed to have long codes. (As always, if all of the fields do not fit on the screen at once, a CTRL/N will show you the Next page of the list.)

Once you have chosen your field, a new menu will give you several options, as follows:

1. List Code Field Descriptions. Here you may enter a starting code value, or press RETURN to start with the first code for that field. All existing long code descriptions, beginning with any assigned to the starting value you have entered, will be displayed on your screen.

2. Add/Change/Delete Codes. In this mode, you will
first enter the short code for a field. Any existing
long code description assigned to that code value will
be displayed on the next line. You may then enter a new
description for that short code by typing it in and
pressing RETURN. To actually make the entry into the
file, you must then enter a CTRL/S (for Save). Or you
may enter a CTRL/D to Delete that entry from the file.
Pressing the ESCape key will let you re-start the
current entry, or you may enter a CTRL/N to move on to
the next code.

NOTE: DO NOT ASSIGN LONG CODE DESCRIPTIONS TO NEGATIVE
NUMBERS. Descriptions assigned to negative numbers will
not be found and printed. Instead, the field will be
treated as though there were no description present,
and the actual field contents (the negative number)
will be printed on your report for that record.

3. Select a New Code Field. This option will take you
back to the field list, where you may choose another
field to work with.

4. Delete All Codes For This Field. This option does
just what it says: it eliminates any long code
descriptions that have previously been set up for the
field that you are working with. It will not affect
codes that have been set up for other fields.

5. Return to File Maintenance Menu.

5. Changing Passwords

As mentioned earlier, the program will allow you to
add, drop or change passwords at any time. However, in
order to do so you must know the Master Password
assigned when the file was created. If the file already
has passwords, and you entered the file with the Master
Password, then you will not be asked again. Otherwise,
the program will ask you for the Master Password as
soon as you enter a "5" from the File Maintenance Menu.

Next the program will ask if you want passwords for
this file. If you do NOT want passwords, any that have
been previously assigned will be dropped (except, of
course, for the Master Password itself), and you will
return to the File Maintenance Menu.

If you DO want passwords for your file, you may then
enter a new set of passwords. Any existing passwords
will be displayed as default values, so if you do not
wish to change them, they need not be re-typed.

(Note that the convention of being able to press the
ESCape key to back up to a previous field does not
function in the File Maintenance module. If you have
made a mistake in an earlier field, finish your
entries, then when the program returns you to the File
Maintenance Menu, simply re-enter the Change Passwords
mode.)

6. Printer Parameters

D B MASTER includes a very flexible system designed to
interface with the widest possible variety of printers
and printer interfaces. By answering a simple series of
questions it is possible to make the program work
properly with your printer.

NOTE: D B MASTER is not designed to work with printers
or interface systems (such as the use of the "game I/O"
socket) which require the use of a software driver
program in RAM.

THE PRINTER PARAMETERS MUST BE SET UP ONCE FOR EACH
FILE THAT YOU BUILD WITH D B MASTER. This is an
unfortunate result of the fact that the program
diskette cannot be written to (and in fact, has no room
available on it!). So jot down the parameters that you
set up, and keep them handy for the next time that you
set up a file.

Also, we suggest that you set up your printer
parameters immediately upon the creation of each new
file.

The printer parameters are as follows:

a. Printer Slot Number. Enter the slot number which you usually use for your printer interface. (There is already a default of slot #1, which is the recommended printer slot.) When printing a report or a record, the value you enter here will be offered as a default value, and you may accept it or enter a different slot number (in case you have more than one printer, or wish to send a report over a modem, etc.). Other printouts, such as the specifications for report sub-formats, will automatically go to the slot you choose here.

b. Send Form Feeds to Printer? (Default = NO) If your printer will accept a form feed from the computer, enter a "Y" here. Otherwise, enter an "N", and the program will know that it must send a series of blank lines to the printer before beginning the next page. NOTE: the Apple Silentype printer does not have a true form feed capability. We suggest that you do not use form feed with that printer.

c. Send Line Feeds to Printer? (Default = NO) If your printer requires a line feed in addition to a carraige return, enter a "Y" here. If you ask the program to print something, and it just keeps printing over and over again on the same line, then your printer requires line feeds. If, on the other hand, the program is skipping one extra line each time it goes to print another line, then you probably are sending line feeds when they are not needed. In that case, enter an "N" for the answer to this question.

d. Carriage Return Delay. (Default = 0) Many printers need a short delay before printing a new line to enable the print head to return to the left margin. A typical symptom of this would be missing characters at the beginning of a line, or failure to leave blank lines where they are expected. If your printer's manual does not tell you how much time it requires for carriage return, you will have to experiment a bit. The delay is entered in hundreths of a second, and delays of .01 to 2.5 seconds are possible. A typical delay would be .2 seconds (enter a 20).

e. Interface Type. (Default = 2 - Apple Serial Interface) D B MASTER supports the interfaces sold by Apple Computer, plus two interfaces made by California Computer Systems, and Apple's Silentype. Enter the number for your interface as follows:

1. Apple Parallel Printer Interface or Centronics Interface card
2. Apple Serial Interface - also known as High Speed Serial or G.P. (for general purpose) Serial card
3. Apple Communication Interface (also known as the Com Card)
4. California Computer Systems Asynchronous Serial Interface (model 7710)
5. California Computer Systems Parallel Interface (model 7720A)
6. Apple Silentype Printer

Most other interface cards designed for the Apple II computer can also be made to work. If the card can be turned on by a "PR#(slot #)" command from Basic, then it will probably work, although you may have to experiment a bit to see which of the other interface numbers to enter.

f. Default Print Width. (Default = 79) Enter the width that you will use most often in preparing reports. Once you have entered a value here, that value will be offered as a default value (just press RETURN to accept it, or type in any other value you wish to use) whenever you go to set up a new report.

g. Printer Control Strings. (Default = none) In addition to the other printer parameters, D B MASTER will let you build two "strings" of characters, the first of which will be sent to the printer at the beginning of each printout, and the second at the end. These strings may each be up to 10 characters long, and may include any ASCII codes, including escapes and control characters, as well as normal letters and numbers.

Before you enter a printer control string, you will have to know which characters you want in the string, and their ASCII codes. The characters are set up by entering their ASCII codes, since some of them cannot be typed from the Apple's keyboard. Lists of ASCII codes can be found in the Applesoft Reference Manual (pp.138-139) or the Apple II Reference Manual (p.15).

To set up a printer control string, enter the codes for the characters you want one at a time, pressing RETURN after each one. When you have finished, enter a zero, and press RETURN again. The program will then go on to the second, or ending, printer control string, which is set up in the same fashion.

For example, if you need to send the sequence "Control/I 80 N" to your printer (or interface card), enter the ASCII codes: 9, 56, 48, and 78. Those are, respectively, the codes for a Control/I, the numbers 8 and 0, and the letter N.

NOTE: the "CTRL/I 80 N" sequence is only used here as an example. If you are using an Apple Parallel Printer Interface card (the card which normally requires this type of instruction), and if you set the printer parameters properly for that interface type, the program will take care of setting the print width of the card for you. You need not use the printer control strings for that purpose.

If you do not want a printer control string, simply enter a "0" in place of the first code, and the string will be eliminated.

Note that the printer control strings, like the rest of the printer parameters, may be changed whenever and as often as necessary, so don't hesitate to experiment when necessary.e

COMMON USER PROBLEMS WITH D B MASTER

1.   D B MASTER's powerful report generator should
work with most popular printers and interfaces.
However, the program must have its printer parameters
set correctly. To do so enter the File Maintenance
section of the program and follow the directions on
pages 108-110 in the manual. Nearly a third of the
calls to our tech staff are because of printer
parameters which have not been set properly.   Please
help us by checking this first when your printouts do
not seem correct.

2.   D B Master's DOS requires that disk drives
function properly. If you have a problem with your
drives not accepting data diskettes the drives should
be cleaned and adjusted for proper speed.   In some
cases reversing drives 1 and 2 on the controller card
may help.   Your controller card should be checked
too.   Use of disk hole reinforcement rings is
strongly recommended.

3.   Some of Apple's newer disk drives do not always
center diskettes properly. It is our experience that
Apple's fix for this problem is not completely
effective.   Most of the bad data diskettes received
at Stoneware have been obviously pinched and/or
mounted off center. The solution to this problem is
to ALWAYS open and close the drive door 2 or 3 times
whenever a diskette is inserted!

4.   Feedback from many D B MASTER users indicates
that some new drives intermittently seem to "reject"
utility or master diskettes which are actually seated
in them. The Dynamic Prompting will keep asking for
a disk that IS already placed in the specified drive.
Mike Dortch, of Replicon in San Francisco, suggests
you turn your drive up on its cable-- with the
drive's door facing the ceiling. Our users who have
encountered this   situation recommend this
solution--silly as it may seem. Tilt the drive and
it will now, hopefully, read the disk.

5.   ALWAYS BACK-UP YOUR FILES. We cannot emphasize
this enough.   Keep at least 2 generations of
back-ups.   NEVER back-up your files on your last or
only back-up set--if your electric power supply was
intterupted while you where backing-up to your only
backups ALL your files could be destroyed.   Always
have some blank diskettes on hand.

ADDITIONAL FEATURES

BOOT FROM ANY SLOT

D B MASTER will boot up from ANY slot to which your disk drives are connected.

AUDIT TRAIL

When adding records to a file you will be given the choice of listing the new entries to your printer as you add them. This may eliminate the need to run a special daily update report to get a hard copy of your entries.

DUPLICATE KEY RESPONSE

When adding records to a file D B MASTER will not let you enter a record with a primary key identical to another record already in the file. The message "Key Already Exists" appears on your screen and you must re-enter the record. When you press RETURN the record you tried to add re-appears on the screen- as in Last Record Default Mode. You may now change the key information. Once you have changed the primary key you may enter Control/A to add the record.

STATISTICS IN LIST RECORDS MODE

If you are in the List Records to Printer Mode (#3 from Main Menu) and request a Totals search, the running summary of the statistics will appear on the screen and the final result will be sent to your printer.

PRINTING CODE FIELD INFORMATION

To list your Long Code Descriptions enter File Maintenance Mode, then enter the Code Field Descriptions section and a prompt will ask you if you wish to list descriptions to your printer. If not, they will be printed on the screen.

APPENDIX

1. Error Messages & Other Problems

D B MASTER error messages come in several different types:

1. (function) NOT AVAILABLE, where the function might be Add Records, Editing, File Maintenance, etc. The message means that you have entered a file with a read only password, and that the indicated function is not available for use at your password level,

2. FILE PROBLEM. Any message which indicates a file problem means that something has happened to one of your diskettes or to the information on it. IF YOU GET A FILE PROBLEM ERROR, YOU SHOULD IMMEDIATELY EXIT THE PROGRAM AND GO TO YOUR BACK-UP DISKETTES.

(The one exception to this is the case described on page 106, when the addition of a new secondary key takes a file beyond its maximum capacity.)

In the event that you do not have a back-up copy of your file, you may attempt to restore the file by re-blocking it (see File Maintenance). However, IF YOU RE-BLOCK A FILE WHICH HAS HAD FILE PROBLEMS, YOU MAY LOOSE SOME OF YOUR RECORDS. THERE WILL BE NO WAY (unless you have a hard copy listing of your records) OF DETERMINING WHICH RECORDS HAVE BEEN LOST. THIS IS WHY BACK-UP COPIES AND DAILY UPDATE LISTS ARE SO IMPORTANT!!

3. CAN'T CHANGE RECORD means:

a. you have tried to change the primary key of a record to the primary key of another record

b. you have re-typed part of the primary key back to its original state

c. one of your secondary key files has been damaged — rebuild your secondary keys, using File Maintenance

4. KEY ALREADY EXISTS — there is already a record in your file with the same primary key as the new record you are trying to add. Each record's primary key must be unique. Change one of the primary fields.

5. BREAK IN LINE (line number), 6. ER = (error #) LI = (line number), 7. DOS, IOI, IAC, PRE, etc. IN LINE (line number) — any of these error message means that you have probably found a "bug" in D B MASTER. Please write down the entire error message, along with as much information as possible about what you were doing when the program stopped, and call Stoneware   at (415) 454-6500. We have tried our best to eliminate all problems from the program, but in the event that we've missed any, your help in tracking them down will be greatly appreciated.

In addition to the error messages listed above, there are two problems which may occur from time to time:

1. You try to delete a record, but it remains in the file, and there was no error message. This probably indicates that there is a problem with your secondary keys. Go into the File Maintenance module and rebuild them.

2. You have the diskette that the program is asking for inserted into the proper disk drive, but every time you press RETURN, the program just keeps asking for the diskette again. There are several step that may be tried here:

a. Gently open and close the door to the disk drive two or three times. Sometimes, particularly with the newer disk drives, the diskette does not seat properly when first inserted. Opening and closing the door will frequently solve the problem.

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b. Be sure that the diskette is inserted properly in the drive. The side with the label should be facing up, and the end of the diskette with the oval shaped opening in the diskette's jacket should be inserted first into the disk drive. (Remember that you should never touch the diskette itself - always handle it by the jacket!)

c. Sometimes a diskette which is returning I/O errors (one reason why the program may keep asking for the diskette) can be repaired by adding a reinforcing ring (E.G. "Floppy Saver, etc.") to the diskette. Another method which sometimes works is to remove the diskette and, being careful to touch only the portion of the diskette exposed in the center hole, gently turn the diskette a half turn or so in its jacket. If neither of these steps helps, you can try copying the diskette with one of the regular Apple copying programs (such as "COPYA"), and in some cases the copy will function properly. IF ANY OF THESE STEPS WORKS, IT IS TIME TO RE-BLOCK YOUR FILE, AND STOP USING THE TROUBLESOME DISKETTE BEFORE IT QUITS ENTIRELY!

d. Be sure that you really do have the proper diskette in the drive. Remember the difference between the master and utility diskettes, and be sure that you have the proper file name, file creation date, and volume number.

e. As a last resort, try turning off the power and re-booting. If you still can't get it to work, it's time to go to your back-up set of diskettes. (You do have a back-up set of diskettes, don't you?)

2. Using Non-Standard Slot/Drive Assignments

D B MASTER is designed to use disk drives connected to 6/1, 6/2, 5/1 and 5/2 (slot#/drive#), in that order. If you are using a different configuration, enter a "0" for the number of drives connected when you boot up your system. The program may then be configured for your system. The program will use 1-4 disk drives, and they may be connected to any slot, with the one exception listed below.

NOTE: D B MASTER MUST BE BOOTED FROM SLOT #6, DRIVE #1, OR IT WILL NOT WORK.

NOTE: This version of D B MASTER is only designed to function with the standard 5 1/4" mini-floppy disk drives normally supplied by Apple Computer Co. For special versions to work with 8" floppy disk drives or hard disks, see your Stoneware dealer, or call Stoneware.

3. Emulating a Hierarchical Database

A hierarchical database management system is one which allows records in different files to be related to one another. The records in these files can be accessed and manipulated based on their relationship.

For example, imagine that you wished to create a geographical data base, including information about various cities, states, nations, and perhaps also rivers, mountains, oceans and other geographical features.

In a true hierarchical system, you would define record TYPES for each of these categories, each with its own set of FIELDS. For instance, for a city, you might wish to store its population and area, the state or province and country in which the city is located, and also a list of the city's major industries. For a river, you might want the length, average depth and rate of flow, and the various cities, states, etc. through which it flows.

You could then request information about all of the rivers in a particular country, or conversely, all of the areas affected by one particular river.

Generally, the file management systems on personal computers do not allow for this type of complex record or file structure. By making use of several of D B MASTER's advanced features, however, it is possible to emulate or "look like" those systems.

D B MASTER will allow you to create files wherein there appear to be two or more record "types," each record or set of records of one type being "owned by" a record of another type. This can best be illustrated with an example.

Let's say that you wish to build a patient file for a medical office. You wish each patient to have a "PATIENT" record, which includes their name, address,

phone number, and other general information. In addition, you would like each "PATIENT" record to "own" an "INSURANCE" record with all of that patient's insurance information, a "PHARMACY" record, containing the names of the medications prescribed, and a series of records called "VISIT", each of which would contain the information pertinent to a single visit.

A diagram of a single patient's records might look like this:

D B MASTER CAN HANDLE COMPLEX FILE STRUCTURES

FOR EXAMPLE:

```
                    ┌──────────────────┐
                    │  PATIENT RECORD  │
                    └──────────────────┘
      ┌──────────────┐  ┌──────────────┐  ┌──────────────┐
      │  INSURANCE   │  │   PHARMACY   │  │    VISIT     │
      │   RECORD     │  │    RECORD    │  │   RECORDS    │
      └──────────────┘  └──────────────┘  └──────────────┘
```
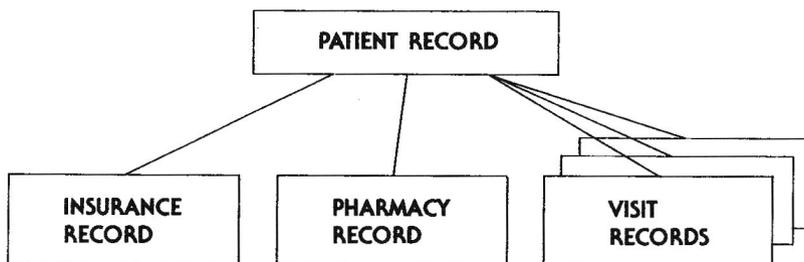
To create such a file, you must take the following steps:

1. Design each of the record types that you will need (on paper - don't use the program yet). The one major limitation of this type of design is that ALL OF THE FIELDS FOR ALL OF THE RECORD TYPES MUST FIT IN 100 FIELDS AND 1020 BYTES! In addition, each of the "owned" record types (all but the main record - the PATIENT record in the example above) are limited to 24 fields per record type. Within these restrictions, there is no limit to the number of record types that you may have.

Where an identical field type and length will be used in two or more record types, a single field may be shared by two or more record types, in order to keep the total number of fields and bytes down. For instance, you might use a field called "PHONE NUMBER" for the patient's number in the PATIENT record, for their druggist's number in the PHARMACY record, and for their

insurer's number in the INSURANCE record. The field will have the same name in each record type, but may appear in different positions on the screen or in the sequence of fields. Note that you must be particularly careful of your design if a shared field happens to be in the primary key, as you will see in a moment.

2. Design a primary key which may be shared by all of your record types, and which includes at least one field which will set the record types apart. To continue with our patient file example, the primary key might be PATIENT NUMBER + RECORD TYPE + DATE. (Note that if you use a social security number field for the patient number and a 0-255 numeric field for the record type, your primary key length will be only 11+1+8=20 bytes.)

The first field of the primary key will now tie your different record types together: in our example, a record with a patient number, the numeral "1" and no date in the primary key would be a PATIENT record. The record with the same patient number, the numeral "2", and again no date, would be that patient's INSURANCE record, and so forth. In this example, only the VISIT record type (primary key = patient number, "4", date) needs to have the date filled in, since you will want to be able to have a number of different visits associated with each patient. On the other hand, you might also wish to have a PHARMACY record for each new prescription, so PHARMACY records could also use the date field (primary key = patient number, "3", date).

3. Using the program now, build a file with the primary key you have designed, and containing all of the fields for all of the record types you will need. The first page(s) of your form should be the main ("owner", or "parent") record (the PATIENT record in our example), and any fields not used by that record should be placed on later pages. Don't worry about the layout of those additional fields, or about the fields that will be shared by more than one record type. You will be building Short Forms to handle each of the owned record types, and you may re-arrange things then.

If your total record size is not too big (less than 500 bytes, less than 50 fields), you might include two or three extra fields at the very end of your main form, just in case you think of something that you've left

out. One extra alphanumeric field and one extra
floating point numeric field, for instance, might prove
to be very useful. They could then be added to your
short forms at a later date as necessary.

4. Finally, build a short form for each of the owned
record types (INSURANCE, PHARMACY & VISIT). Remember
that if you wish to be able to add records using the
short forms (as you doubtless will), each of them MUST
include all of the primary key fields, in order, as the
first fields on the short form.

Now, when you wish to access your records, simply load
the appropriate short form, and remember to fill in the
proper record type number when you go to add or search
for a record.

Note that you will actually be working with one main
record, but that the short forms make the main record
appear to be a series of smaller records. D B MASTER's
automatic data packing will condense the unused fields
for each record type into just a few bytes, so you will
not be wasting a lot of storage space.

A single Auto Date field in the main form will suffice
for all record types, and may be displayed on the short
forms or not, as desired. Even if it is not displayed,
it may still be used and printed in preparing reports.

You may also find it useful to establish a secondary
key on the Record Type field. If you did so, you would
be able to quickly access, for instance, all of the
patients who visited your office on a certain day or
range of dates. Or you could look through all of your
pharmacy records, checking for those that included a
specific prescription, etc.

DB MASTER SPECIFICATIONS:

Data Types:

Numeric—there are four numeric data types. Each accepts only numerals and, if appropriate, a single negative sign or decimal point. Numbers are stored in their compacted (binary) form for increased storage capacity.

- 0 to 255 (one byte)
- +/-32767 (two bytes)
- Floating point (9 digits, 5 bytes)
- Dollar/Cents fields are pre-formatted, use right to left (calculator style) data entry (9 digits, 5 bytes)

Alphanumeric—1 to 30 characters (for longer comments, combine 2 or more fields)

Yes/No—1 character, only accepts "Y" or "N"

Social Security, Date and Phone Number fields are pre-formatted. The cursor skips over the dashes automatically during data entry & back-spacing. These fields cannot be left partially finished—they must be left empty or completely filled in.

Auto Date fields automatically contain the date of the last time each record was edited (changed). Auto Date fields make it very easy to print daily update lists.

II. Storage Method & Access Times:

D B MASTER uses an ISAM (Indexed Sequential Access Method) filing system. Records are stored and maintained automatically in their primary key order. The primary key is user defined, and includes the first field or fields in the file, to a maximum of four fields or 35 bytes. Any record on a diskette can be retrieved in about 3 seconds if requested by its primary key.

Secondary keys may also be set up and maintained automatically on the user's choice of fields. Records will be retrieved by secondary keys in about 7 seconds.

III. Sorts are only necessary when printing reports in other than primary key order. Otherwise, D B MASTER never has to do any sorting.

IV. Capacity:

- Up to 1020 bytes per record
- Up to 100 fields per record
- Up to 9 screen pages per record
- Up to 4 fields in primary ISAM key
- Any number of secondary keys
- Supports multi-diskette files. Maximum file size depends on a number of factors. Typical range is 1 to 5 megabytes.

V. Report Generator:

- 0 to 9 lines of comments or footnotes
- 0 to 9 lines of column titles
- Up to 100 columns on as many as nine lines
- Up to 24 computed fields per report. Add, subtract, multiply, divide or exponentiate. Compute with record values, constants or other computed fields.
- Five Horizontal Subtotals (for totaling fields within a record) and a Grand Total
- Column totals
- Sort on 1 to 6 fields
- Optional subtotal (control) breaks and page breaks when sort field values change
- Automatic number formatting
- Comment fields
- Auto page numbering & report dating
- Summary Only reports print subtotals and totals only
- Special formats for screen reports and printing labels

VI. Special Features:

- "Short Forms" display only a portion of your form for rapid repetitive editing. (Also useful for emulating relational data base systems.)
- Three levels of password file protection
- Automatic "data packing" for increased disk capacity
- "Code Fields" (table look-up fields) store short codes, print long descriptions on reports
- Calculator mode for performing math functions with field values
- Daily Update lists print all records added or edited on the current date, since a specific date or within a range of dates (file must include an Auto Date field)
- D B MASTER includes its own Disk Operating System which is faster and more efficient than Apple's DOS. All disk access (including program chaining!) done with fast "RWTS" routines.

VII. System Requirements:

1. Apple II or Apple II Plus with ROM Applesoft Basic or Language System.
2. 1 to 4 Disk Drives (2 recommended)
3. DOS 3.3 or the Language System
4. A printer is recommended. D B MASTER supports Apple's High Speed Serial, Parallel, and Communications interfaces. Printer control characters may be sent at the beginning and end of each printout.
5. Special versions of D B MASTER are planned for use with hard disks and 8" floppy systems.

MAXIMUM NUMBER OF RECORDS PER FILE

The charts on the following pages show the maximum number of records that can be entered into typical D B MASTER files.

ALL OF THE FIGURES IN THE CHART ARE APPROXIMATIONS. They assume a 30% average for data compaction. That is, it is assumed that a combination of partially filled-in or empty fields and random occurances of packable characters will make the average record only 70% as large as the maximum size established for that file.

In addition, it has been assumed for the purposes of the chart that the average field label or name ("LAST NAME", "ZIP CODE", "ADDRESS", etc.) will be 8 characters long. A reasonable amount of space has also been allowed for storing report formats, short forms, long code descriptions, etc.

Note that if you anticipate building a very large file, it will be to your advantage to keep each of the four determining factors (record length, primary key length, combined length of all field names, and number of secondary keys) as small as possible.

RECORD LENGTH	# OF FIELDS	KEY LENGTH	# OF SEC.KEYS	# OF RECORDS	#MASTER VOLUMES	#UTILITY VOLUMES
100	15	15	0	387045	252	1
100	15	15	1	175078	114	43
100	15	15	2	128997	84	63
100	15	25	0	227301	148	1
100	15	25	1	73702	48	25
100	15	25	2	51893	34	35
100	15	35	0	142822	93	1
100	15	35	1	25126	17	11
100	15	35	2	17238	12	15
200	15	15	0	182770	238	1
200	15	15	1	98214	128	24
200	15	15	2	80627	105	40
200	15	15	3	68578	90	50
200	15	25	0	105971	138	1
200	15	25	1	41066	54	14
200	15	25	2	32478	43	22
200	15	25	3	26867	35	28
200	15	35	0	66034	86	1
200	15	35	1	12274	16	6
200	15	35	2	9970	13	9
200	15	35	3	7667	10	11
200	25	15	0	172787	225	1
200	25	15	1	89944	118	22
200	25	15	2	73918	97	36
200	25	15	3	63064	83	46
200	25	25	0	99059	129	1
200	25	25	1	35314	46	13
200	25	25	2	28402	37	20
200	25	25	3	23644	31	24
200	25	35	0	60659	79	1
200	25	35	1	8764	12	4
200	25	35	2	6899	9	7
200	25	35	3	5363	7	8
300	15	15	0	114678	224	1
300	15	15	1	65014	127	16
300	15	15	2	55798	109	28
300	15	15	3	49279	97	36

RECORD LENGTH	# OF FIELDS	KEY LENGTH	# OF SEC.KEYS	# OF RECORDS	#MASTER VOLUMES	#UTILITY VOLUMES
300	15	25	Ø	66039	129	1
300	15	25	1	26102	51	9
300	15	25	2	22006	43	15
300	15	25	3	18666	37	19
300	15	35	Ø	40438	79	1
300	15	35	1	6427	13	3
300	15	35	2	5550	11	5
300	15	35	3	4479	9	6
300	25	15	Ø	108535	212	1
300	25	15	1	59382	116	15
300	25	15	2	51175	100	25
300	25	15	3	45144	89	33
300	25	25	Ø	61431	120	1
300	25	25	1	22006	43	8
300	25	25	2	18935	37	13
300	25	25	3	15863	31	17
300	25	35	Ø	36855	72	1
300	25	35	1	4086	8	2
300	25	35	2	3063	6	3
300	25	35	3	2551	5	4
300	35	15	Ø	101879	199	1
300	35	15	1	53238	104	14
300	35	15	2	46583	91	23
300	35	15	3	40951	80	30
300	35	25	Ø	56823	111	1
300	35	25	1	18422	36	7
300	35	25	2	15863	31	11
300	35	25	3	13688	27	14
300	35	35	Ø	33271	65	1
300	35	35	1	1752	4	1
300	35	35	2	876	2	1
300	35	35	3	583	2	1
500	25	15	Ø	56518	184	1
500	25	15	1	30407	99	8
500	25	15	2	27641	90	14
500	25	15	3	25185	82	19

RECORD LENGTH	# OF FIELDS	KEY LENGTH	# OF SEC.KEYS	# OF RECORDS	#MASTER VOLUMES	#UTILITY VOLUMES
500	25	25	0	31022	101	1
500	25	25	1	9210	30	4
500	25	25	2	8288	27	6
500	25	25	3	7673	25	8
500	25	35	0	17812	58	1
500	25	35	1	1635	6	1
500	25	35	2	857	3	1
500	25	35	3	583	2	1
500	35	15	0	52832	172	1
500	35	15	1	27028	88	7
500	35	15	2	24294	80	12
500	35	15	3	22419	73	17
500	35	25	0	28563	93	1
500	35	25	1	7060	23	3
500	35	25	2	6138	20	5
500	35	25	3	5724	19	6
500	35	35	0	15662	51	1
500	35	35	1	1440	5	1
500	35	35	2	759	3	1
500	35	35	3	519	2	1
500	50	15	0	46996	153	1
500	50	15	1	21498	70	6
500	50	15	2	19655	64	10
500	50	15	3	17812	58	14
500	50	25	0	24263	79	1
500	50	25	1	3373	11	2
500	50	25	2	3065	10	3
500	50	25	3	2736	9	3
500	50	35	0	12590	41	1
500	50	35	1	1168	4	1
500	50	35	2	608	2	1
500	50	35	3	414	2	1
750	35	15	0	28258	138	1
750	35	15	1	11873	58	4
750	35	15	2	11259	55	6
750	35	15	3	10646	52	8

RECORD LENGTH	# OF FIELDS	KEY LENGTH	# OF SEC.KEYS	# OF RECORDS	#MASTER VOLUMES	#UTILITY VOLUMES
750	35	25	0	14127	69	1
750	35	25	1	2189	11	1
750	35	25	2	1119	6	1
750	35	25	3	746	4	1
750	35	35	0	6754	33	1
750	35	35	1	895	5	1
750	35	35	2	485	3	1
750	35	35	3	336	2	1
750	50	15	0	24162	118	1
750	50	15	1	8188	40	3
750	50	15	2	7753	38	4
750	50	15	3	7369	36	6
750	50	25	0	11464	56	1
750	50	25	1	1791	9	1
750	50	25	2	969	5	1
750	50	25	3	662	4	1
750	50	35	0	4706	23	1
750	50	35	1	623	4	1
750	50	35	2	349	2	1
750	50	35	3	232	2	1
750	75	15	0	17814	87	1
750	75	15	1	3100	16	1
750	75	15	2	2043	10	2
750	75	15	3	2043	10	2
750	75	25	0	6959	34	1
750	75	25	1	1095	6	1
750	75	25	2	597	3	1
750	75	25	3	406	2	1
750	75	35	0	1430	7	1
750	75	35	1	201	1	1
750	75	35	2	197	1	1
750	75	35	3	180	1	1
1000	50	15	0	12899	84	1
1000	50	15	1	3031	20	1
1000	50	15	2	1550	11	1
1000	50	15	3	1225	8	2

RECORD LENGTH	# OF FIELDS	KEY LENGTH	# OF SEC.KEYS	# OF RECORDS	#MASTER VOLUMES	#UTILITY VOLUMES
1000	50	25	0	5066	33	1
1000	50	25	1	995	7	1
1000	50	25	2	546	4	1
1000	50	25	3	380	3	1
1000	50	35	0	764	5	1
1000	50	35	1	154	2	1
1000	50	35	2	151	1	1
1000	50	35	3	143	1	1
1000	75	15	0	8137	53	1
1000	75	15	1	1860	13	1
1000	75	15	2	1068	7	1
1000	75	15	3	758	5	1
1000	75	25	0	1686	11	1
1000	75	25	1	348	3	1
1000	75	25	2	173	2	1
1000	75	25	3	151	1	1
1000	75	35	0	134	1	1
1000	75	35	1	124	1	1
1000	75	35	2	115	1	1
1000	75	35	3	110	1	1
1000	100	15	0	3222	21	1
1000	100	15	1	758	5	1
1000	100	15	2	446	3	1
1000	100	15	3	297	2	1
1000	100	25	0	134	1	1
1000	100	25	1	126	1	1
1000	100	25	2	119	1	1
1000	100	25	3	115	1	1
1000	100	35	0	92	1	1
1000	100	35	1	87	1	1
1000	100	35	2	78	1	1
1000	100	35	3	76	1	1

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PRIMARY KEY CHANGE:

PRIMARY KEY MAY CONTAIN
UP TO TEN FIELDS
MAXIMUM LENGTH=35 BYTES

****REPORT GENERATOR MODIFICATION****

Please note the following change:

D B MASTER WILL SKIP A LINE BEFORE PRINTING THE
FIRST PAGE OF ANY REPORT

PLEASE ADJUST YOUR PAPER OR LABELS IN YOUR
PRINTER ACCORDINGLY

Reports created by previous versions of D B
MASTER will be effected--the first line on the
first page of ALL reports will be skipped BEFORE
printing begins

KEEP THIS IN MIND WHEN YOU ARE READY TO PRINT

FORWARD

You will soon learn how to place important records,
tasks and information into your computer--forming a
foundation of data for your use. D B MASTER gives
you many powers of manipulation over this Data Base.
You will design, create and use a system tailored to
your needs of today and for years to come.

To prevent needless confusion, error, wasted time and
energy, please note the following suggestions:

Each file created using D B MASTER'S Program diskette
will generate at least TWO additional diskettes:
A MASTER or DATA diskette, which contains your
records.
A UTILLITY diskette, which stores the file structure,
report formats, etc., for your file.

Do not rush to create your system. Take time to
explore and understand all of D B MASTER'S features
BEFORE you create your working system. Design your
files and reports on paper before you place them in
the system.

Your computer and Data Base Disks should always be
treated with the utmost respect.

Keep your working environment as static free and dust
free as possible-both can destroy or damage your
system.

Copy your files everytime you change them. Always
keep at least two generations of back-up diskette
copies.

Invest in a AC/voltage surge protector to prevent
accidental damage to your files.

Instruct others who will be using your system in its
proper use and care.

Before attempting to use any of D B MASTER'S print
options make sure you have set the correct Printer
Parameters for your printer (see pages 108-111).

Always keep a hard copy of your File Statistics
available for reference.

**ABUSE OF YOUR SYSTEM MAY MAKE IT USELESS WHEN YOU
NEED IT THE MOST!**

D B MASTER QUICK GLOSSARY

DATA BASE - A filing system of specific data organized for a particular application.

DYNAMIC PROMPTING(TM) - The screen display of user options and commands.

FIELD - An item of information.

PAGE - Screen display of fields.

FORM - Screen display of up to 9 pages.

RECORD - A form in which information has been entered.

FILE - A unique system of data storage, consisting of many individual records using the same form.

FIELD TYPE - Fields designed for a specific kind of data (alphanumeric, numeric, date, etc,).

PRIMARY KEY - A combination of up to four fields which will make each record unique and quickly accessable.

BYTE - A unit of internal storage.

KEY LENGTH - The number of bytes needed to store the primary key.

SECONDARY KEYS - Fields you designate for rapid retrieval other than the first primary key.

D B MASTER PROGRAM DISKETTE - The disk supplied in this package.

MASTER or DATA DISKS - Disks that hold the actual records entered in a file.

UTILITY DISKS -Disks which store all "housekeeping" information for a file.

SORT FILE DISKS - Disks created and used in a report where sorted files are temporarily stored before they are printed.

BACK-UP DISKS - Copies of utility and master disks created daily to enable you to recover if your files are destroyed or damaged.

PRINTER PARAMETERS - User specified instructions so D B MASTER will work with your printer.

COMMON USER PROBLEMS WITH D B MASTER

1.   D B MASTER's powerful report generator should work with most popular printers and interfaces. However, the program must have its printer parameters set correctly. To do so enter the File Maintenance section of the program and follow the directions on pages 108-110 in the manual. Nearly a third of the calls to our tech staff are because of printer parameters which have not been set properly. Please help us by checking this first when your printouts do not seem correct.

2.   D B Master's DOS requires that disk drives function properly. If you have a problem with your drives not accepting data diskettes the drives should be cleaned and adjusted for proper speed. In some cases reversing drives 1 and 2 on the controller card may help. Your controller card should be checked too. Use of disk hole reinforcement rings is strongly recommended.

3.   Some of Apple's newer disk drives do not always center diskettes properly. It is our experience that Apple's fix for this problem is not completely effective. Most of the bad data diskettes received at Stoneware have been obviously pinched and/or mounted off center. The solution to this problem is to ALWAYS open and close the drive door 2 or 3 times whenever a diskette is inserted!

4.   Feedback from many D B MASTER users indicates that some new drives intermittently seem to "reject" utility or master diskettes which are actually seated in them. The Dynamic Prompting will keep asking for a disk that IS already placed in the specified drive. Mike Dortch, of Replicon in San Francisco, suggests you turn your drive up on 'its cable-- with the drive's door facing the ceiling. Our users who have encountered this situation recommmend this solution--silly as it may seem. Tilt the drive and it will now, hopefully, read the disk.

5.   ALWAYS BACK-UP YOUR FILES. We cannot emphasize this enough. Keep at least 2 generations of back-ups. NEVER back-up your files on your last or only back-up set--if your electric power supply was intterupted while you where backing-up to your only backups ALL your files could be destroyed. Always have some blank diskettes on hand.

ADDITIONAL FEATURES

BOOT FROM ANY SLOT

D B MASTER will boot up from ANY slot to which your disk drives are connected.

AUDIT TRAIL

When adding records to a file you will be given the choice of listing the new entries to your printer as you add them. This may eliminate the need to run a special daily update report to get a hard copy of your entries.

DUPLICATE KEY RESPONSE

When adding records to a file D B MASTER will not let you enter a record with a primary key identical to another record already in the file. The message "Key Already Exists" appears on your screen and you must re-enter the record. When you press RETURN the record you tried to add re-appears on the screen- as in Last Record Default Mode. You may now change the key information. Once you have changed the primary key you may enter Control/A to add the record.

STATISTICS IN LIST RECORDS MODE

If you are in the List Records to Printer Mode (#3 from Main Menu) and request a Totals search, the running summary of the statistics will appear on the screen and the final result will be sent to your printer.

PRINTING CODE FIELD INFORMATION

To list your Long Code Descriptions enter File Maintenance Mode, then enter the Code Field Descriptions section and a prompt will ask you if you wish to list descriptions to your printer. If not, they will be printed on the screen.

NEW POLICY ON TELEPHONE SUPPORT FOR D B MASTER

Due to the increasing amount of software "piracy" occuring in the personal computer industry, we have been forced to institute a new policy concerning telephone support for D B MASTER. Beginning immediately, all callers will have to give a registered D B MASTER serial number before questions will be answered. For those who have just purchased the program, a seven day grace period will be allowed, after which no more calls will be answered until their signed registration card is received. To find out your serial number and revision number, simply boot your D B MASTER program diskette. Both numbers will appear on the first display screen. PLEASE HAVE YOUR SERIAL NUMBER AND REVISION NUMBER HANDY WHENEVER YOU CALL STONEWARE FOR SUPPORT!

Our telephone number is 415-454-6500.

Please remember, our office hours are from 9am to 5pm Pacific Time, Monday through Friday.

PLEASE NOTE OUR NEW ADDRESS:

Stoneware Microcomputer Products
50 Belvedere Street
San Rafael, California 94901

REPLACEMENT OF DAMAGED DISKETTES

All requests for replacement diskettes must be made in writing. You must include the damaged diskette and a check for $15.00. This service is available to properly registered users!! Sorry, we will not be able to replace a diskette without having received it.

APPLE III OWNERS

This version of D B MASTER may be used with an Apple III in its Apple II Emulation Mode.

GUIDELINES FOR FILE BUILDING

Maximum   PRIMARY KEY LENGTH is 35 bytes   within   FOUR
fields

Maximum RECORD LENGTH is 1020 bytes

Maximum NUMBER OF FIELDS is 100

When   you   reach   the maximum record   length   or   the
maximum   number of fields permitted D B MASTER   will
automatically STOP file creation and place you in the
Edit Mode for that page.   There is no screen message
reminding   you   that   file limitations   have   been
reached.   The Record Length prompt will flash as you
approach the limit.

Design all your files and reports on paper and print
a copy of your File Statistics after a file is
created.

4.   Computed: Computed Fields can add, subtract,
multiply or divide the contents of any 2 numeric (or
dollar/cents) fields; or a numeric field and a
constant; or another computed field in combination
with another numeric/computed field or constant.

Computed fields are all floating point numbers and
require five bytes of storage space.   The maximum
field length for a computed field is 11 characters.

Computed fields CANNOT be used in your primary key,
and will NOT appear as an option in the Dynamic
Prompting until your key has been created. When you
choose Field Type #2 (Numeric) computed fields will
appear as option #4.

You may have up to 10 computed fields in each record.
After that any attempts to create additional computed
fields will be treated as if you were requesting a #3
Numeric.   The field will be created as a Floating
Point number. All of the computed fields in a record
are re-computed each time that record is edited. Any
time one operand changes, the new result will be put
into the computed field. These calculations will
cause a slight delay each time you finish an edit.
The more computed fields in the record, the greater
the delay.

In more complex calculations, you may include any
computed field as an operand in any other computed
field BUT NOT IN ITSELF!.

Calculations are done in order. A computed field
using an EARLIER computed field as an operand (i.e.,
one which comes BEFORE it in the record) will be
figured based on the NEW data (since it will already
have been calculated). When an operand comes LATER
in the record, the computed field based upon it will
have been calculated BEFORE that operand is changed.
This could be advantagious in applications requiring
cumulative balances or totals.

Unlike the computed fields in the report generator,
these fields are actually stored within the records.
When a record is displayed on the screen, the
computed field will look like any other field, and it
will always contain the proper calculated result. In
the Add Records or Editing Mode, the cursor will SKIP
OVER the computed fields, since the contents of those
fields will be filled in automatically.

When designing your reports, you may sort or select
based upon computed fields. You may use computed
fields within your record as operands in a report's
computed fields or total them, etc.

Computed fields are useful for special report applications as the following examples demonstrate.

To sort and print a report in DESCENDING order, rather than ascending order (based on the contents of a particular field) create the file with a computed field which is equal to (999,999,999) - (X), where X is the field you wish to use for the descending sort. Then sort on the computed value. The end result will be a descending sort on the desired field.

If your file is designed to handle inventory control (with fields for Quantity On Hand and Re-Order Level), create a computed field which is equal to (Quantity On Hand) - (Re-Order Level). By selecting those records where the computed field is less than or equal to zero, you can print a "re-order report" that only includes the items which need to be ordered. The same information could be used to search for those records in the Display mode.

ENTERING COMPUTED FIELD FORMULAS

The formulas for your computed fields are entered after all of the pages of your new file format have been finished. This allows you to have computed fields on page one which are based on values on pages three and five.

After your last page is finished and edited a list of the fields in your new file will be displayed. You can now enter the formulas for your computations.

The name of the field you are setting up will appear on the list in inverse video. Enter the field numbers (or "0" to use a constant), the sign for the operation you wish to use ("+, -, * or /"), and, if required, a constant. The program will then go on to the next computed field, until they have all been set up.

6.   T/TOTAL--Statistics. This powerful search is valuable for any data base you create. You can quickly determine statistical relationships between selected (or all) records.

To use this feature, set up the search criteria for a set of records as you would normally. When the cursor gets to the field that you wish to work with, enter a Control/T. The letter T will appear on the form at the cursor position. You may then enter search criteria in that field, or move on to a later field, or, if you have entered all of your criteria, enter Control/F to find those records.

Instead of showing you the records, the program will clear the screen and display a running summary.   As records are found which match your criteria the display will show the Count, Sum, Average, and Standard Deviation for the field "marked" with the Control/T. If the chosen field is non-numeric only the Count will be displayed.

The displayed TOTALS are determined as follows:

Count = the number of records found which match your search criteria

Sum = the total of the values found in the chosen field, in all of the records which match your search criteria

Average = the Sum divided by the Count

Standard Deviation = the measure of how far the individual values deviate from the mean.   Due to inaccuracies inherant in Applesoft Basic, a small "fudge factor" has been added to the formula for standard deviation.   This factor will only be noticeable in cases where the standard deviation approaches zero.

The totals function gives you the capability to get "column totals" without going into the report generator.   Computed fields may also be totaled and analyzed using this feature.

SPECIAL SELECT CRITERIA FOR AUTO-DATE FIELD

SELECTING BY YEAR: You can select all records from the current year by entering ??-??-99 into an Auto-Date field as part of your Select Criteria.

SELECTING BY MONTH AND YEAR: All records from the current month and year may be selected by entering 99-??-99 into an Auto-Date field as part of your Select Criteria.

SELECTING BY CURRENT DAY: All records with the current day may be selected by entering 99-99-99 into an Auto-Date field as part of your Select Criteria. The selected date will automatically change to a new current date the next day the report is run.

All Special Auto-Date Select Criteria may be used in conjunction with any other Select Criteria you desire.

Everyday a new report is printed D B MASTER will automatically change the Special Auto-Date Select to the NEW current day, month or year. The date the report was created is used only if you run the report right after creating.

CHANGING REPORT PARAMETERS

When your report is ready to print, a display will appear on your screen. You may now change most of the parameters which are set up both in the Page sub-format and in the Printer Parameters section of File Maintenance, plus a few extra features, as follows:

(1) PRINTER SLOT # (0=SCREEN)
(2) SUMMARY ONLY
(3) FORM FEED
(4) LINE FEED
(5) INTERFACE TYPE
(6) SPACES BETWEEN RECORDS
(7) PRINT LINES/PAGE
(8) TOTAL LINES/PAGE
(9) STOP BETWEEN PAGES
(10) STATISTICS
(11) COMMAS

Those parameters which are normally set in File Maintenance or the Page format will default to the values set there. Summary Only, Statistics, and Commas will all default to "No". To change any of the Yes/No parameters, simply enter its number. Each time a parameter's number is entered, it will "toggle" back and forth between Yes and No. To change any of the other parameters, enter its number, and the program will ask for a new value. You may make as many changes as necessary before printing your report.

If you stop your report before it is finished (by pressing "ESC"), or after the report has been completed, the program will ask if you wish to begin that report again. If you say "Yes", the program will return to the Change Parameters display. You may then make whatever changes are necessary (if any), and begin again. This process may be repeated as often as needed.

STATISTICAL INFORMATION IN REPORTS

Statistical information is available in the report generator. To get the Count, you must use "Record Numbering by Report" or "Record Numbering by Subtotal Break". The Sum is the same as a column total. To get the Average and Standard Deviation for those fields which you are totaling, turn on the "Statistics" function before printing the report. This means that your existing reports can be printed with statistics without having to recreate them.

The statistics will be printed at each break where column totals appear. You MUST have requested column totals on a field in order to get statistics for that field.

Statistics may also be included in screen and summary only reports.

FORMATTING NUMBERS WITH COMMAS

Large numbers are much easier to read if they are printed with the standard commas between every three digits to the left of the decimal point. Any report may include commas by simply turning on the Commas function.

When the Commas are turned on, they will be printed based on the following rules:

1. With commas turned on all numeric, computed, sub and grand total and dollar/cents fields will be printed with commas, where possible.

2. If the entire number will not fit in the print width assigned an attempt will be made to print the number without the commas.

3. If the number still does not fit, an asterisk ("*") will be printed at the left-most position of the field followed by as much of the right-hand portion of the number as will fit.

4. If the number has gone into exponential ("scientific") notation, it will only be printed if the print width of the field is at least 15 characters. Otherwise, all asterisks will be printed in that field.

Additional space is required to print commas so the default print width for numeric fields in the Data sub-format has been increased from 11 to 15. If you do not enter a field width when adding a field to a report format the width will be set to 15 characters.

CHANGING THE DATA SUB-FORMAT

Existing Data Sub-Formats may be changed on a section by section basis. This means that you can replace just the comment and titles lines, leaving the actual data fields as they were, or vice versa.

To edit a Data sub-format, enter the report design process by entering a "5" from the Main Menu, then responding that you wish to create a new report format.

After choosing or designing a Page format, pick out the Data format that you wish to edit, then enter a "2" for "Replace This Format."

The first input required will be the width of the report. The width of the original format will appear as the default. IF YOU CHANGE THE WIDTH, YOU WILL HAVE TO RE-ENTER THE ENTIRE FORMAT. To edit the format, simply press return to keep the original report width.

You will now be asked if you wish to change your comment or title lines. The comment and titles lines are treated as a single element – if you wish to make any changes in them, you will have to re-enter them in their entirety.

If you answer "N", the program will move on to the computed fields. If you answer "Y", you will next be asked whether you want comment lines, and so forth, as in the original design process. Your new comment and title lines will replace those in the original Data format.

Next the program will ask if you wish to change your computed fields. IF YOU CHANGE COMPUTED FIELDS, YOU WILL ALSO HAVE TO RE-ENTER YOUR DATA FIELDS! If you answer "Y", you may then re-enter the computed fields for your report.

Finally, you will be asked if you wish to change your data fields. As with the other segments of the format, if you wish to change any of the data fields, you will have to re-enter all of them. The procedure is identical to the original design process.

If you do not need to change the data fields, or when you have finished re-entering them, you will be asked for a name for the data format. The format which you originally choose to work with will now be replaced with the modified format and its new name.

DELETING MASTER REPORT FORMATS

Enter the Report Generator's report format list (from the Main Menu enter a "5" and reply "NO" to the prompt). The list of your file's report formats will appear on the screen. Choose a format and the option to delete that format will appear in the Dynamic Prompting. To delete the format, enter a CTRL/D, and type "YES" to the confirmation question. Once a master format has been deleted, it cannot be recovered. All the sub-formats included in that master format (Page, Data, etc.) will NOT be deleted. Sub-formats can never be deleted – only REPLACED with new formats.

Deleted formats will leave "holes" in the numbering sequence that appears with the format list on the screen. New formats will NOT use the old numbers. Simply ignore the missing numbers.

CHANGING SELECT CRITERIA

Enter the Report Generator to print a previously defined report format (from the Main Menu enter a "5" and reply "NO" to the prompt). The list of the file's report formats will appear on screen. Once you have chosen a format, a number of options will appear in the Dynamic Prompting, including Control/S to change your Select format.

Enter a Control/S and the program will go directly to the module where you enter your Select criteria. Enter your new criteria, and a name for them. THE PROGRAM WILL THEN REPLACE THE SELECT SUB-FORMAT USED IN THE REPORT YOU ARE ABOUT TO PRINT WITH THE NEW SELECTION CRITERIA AND NAME THAT YOU HAVE JUST ENTERED. ANY OTHER REPORTS THAT USE THE SAME SELECT SUB-FORMAT WILL NOW BE BASED UPON THE NEW CRITERIA! This is the same process which occurs when you elect to Replace a sub-format.

The program will then return to the Report Generator, and immediately prepare your report for printing based upon your new Select criteria.

ESCAPING FROM THE REPORT SET-UP PROCESS

When you are designing a new report, a list of the existing formats will appear as you enter the module for each sub-format. The prompt at the bottom of the screen ("ESC =MENU") tells you that by pressing the "ESC" key at that time, you can return to the Main Menu. Whatever work you have completed up to that point will automatically be saved in the Utility file.