LUCID DATABASE

The Lucid Database Manual is divided into two sections, a tutorial and a reference.

The tutorial will take you through the use of the database step-by-step giving you easy to follow instructions and teaching you by example. If you are new to computers you will find this learning approach invaluable.

The reference section which follows the tutorial is a detailed explanation of the Lucid Database features, but it is not written in a teaching style. If you are more familiar with computers, or you have already studied the tutorial, then the reference section will provide you with a source to look up how functions and features are performed.

LUCID DATABASE

Section 1 - Tutorial

Chapter One

Simple Mailing List

If you have not already installed your Super ROM into your Model 100, please refer to the Super Rom manual section S2 before continuing with this tutorial.

I. Create Data File and View Files

A. Getting Started

From the main menu, place the cursor on Super and press ENTER. Screen says:

```
TRS-80 Model 100 Software
Copr. 1985 PCSG (V1.1)

        F1 == Lucid
        F2 == Write Rom
        F3 == Thought
        F4 == Lucid Data
```

1. Press F4 (Lucid Data). Screen says:

```
TRS-80 Model 100 Software
Copr. 1985 PCSG (V1.1)



Lucid File?
```

2. Type

   MAIL

   And press ENTER. Screen says:

```
TRS-80 Model 100 Software
Copr. 1985 PCSG (V1.1)



View file name:
```

3. Type

   MAIL

   (again) and press ENTER.

   You have now created two new files, first was the Lucid file, MAIL.CA, then the view file, MAIL.DO.

B. Design the View Screen

You are now in TEXT, editing the file MAIL.DO. You need to create an input screen template for your mailing list.

```
    Name and Address Input Screen [# ]
Name:[a#                                ]
Cpny:[b#                                ]
Street:[c#                              ]
City:[d#              ] St:[e#] Zip:[f# ]
Ph W:[g#              ] H:[h#           ]
```

Copy this example onto your screen. This is what it all means:

1. Line 1:

   `Name and Address Input Screen`

   is background text that will show on the screen when the user calls it up using View.

   [#] - this is a *field*, i.e., although it contains a # symbol right now, when this screen is called up from View, you will not see the square brackets or the #. Instead you will see the record number of the record that is being displayed on the screen. The # sign is a special symbol that specifies that this field is to display the record (row) number of the record currently being displayed.

2. Line 2:

```
Name:
```

this is more background text. Anything that is not in square brackets is displayed without any changes by View, after which View ignores it, and doesn't allow any changing.

```
[a#                                                    ]
```

this is a field, but different from the field in line 1. The square brackets define the length of the field, but they contain a dataref rather than just the # record number symbol.

This dataref, a#, specifies that when View displays this screen in Lucid Data, this field will show the contents of field A for the record currently being displayed. As with all Lucid Data fields, the square brackets indicate the beginning and end of the field, and are not displayed by View.

When View displays this screen, the wide bar cursor will come to this field first, and will show the entire field in reverse video. You will see this in the next section of this tutorial.

3. Line 3:

```
Cpny:
```

this is more background text. Like Name on line 2, this is ignored by View once it has been displayed.

```
[b#                                    ]
```

this field is similar to the field on line 2, except that instead of displaying the contents of field A of the current record, the dataref b# specifies that the contents of field B is displayed here.

This means that when the record currently being displayed is record 8, this field will display the contents of field B, record 8, which is also cell B8 in the spreadsheet data file.

4. Line 4:

```
Street:
```

this is more background text just like on lines 3 and 2.

```
[c#                                    ]
```

this is another input field, like A# in line 2 and B# in line 3. This time it is for field C in the current record.

5. Line 5:

```
City:[d#              ] St:[e#] Zip:[f# ]
```

Line 5 is different from the other lines in that it actually contains three fields in addition to the background text.

View allows you to move from field to field to enter data, using the TAB key and the arrow keys. There is no limit on the number of fields you can have on a line, but it is physically impossible to have a field shorter than 4 characters in length, since you must have two brackets and a dataref or a cellref, which can't be shorter than 2 characters in length.

View does not care about the layout of the background text. It can be on any line, or a line can be empty. A line can contain background text only, or a field only, or any combination of background text and fields.

6. Line 6:

```
Ph W:[g#                    ] H:[h#
```

Like line 5, line 6 contains more than one field. As you can probably guess by now, the first field on this line will display the contents of field G in the current record, and the second field will display the contents of field H.

7. Line 7:

This line is left blank in this View template for the time being. You can use all the first seven lines for View screens as you wish.

D 1-6 Tutorial - A Simple Mailing List

We will add to this screen later, but for the time being lets press F8 (Exit) to go back to View.

II. Using View

The screen should now look like this:

```
     Name and Address Input Screen     1
Name:
Cpny:
Street:
City:                    St:      Zip:
Ph W:                    H:

Edit Dupe Prev Next Vwpt Text Lucd Exit
 1    2    3    4    5    6    7    8
```

Now we get the chance to actually use the input screen we just finished designing in TEXT.

A. Typing in

1. The wide bar cursor should be resting right next to the 'Name:' prompt. Type in a sample name, for example

   ```
   Name:Joe Orton
   ```

2. Note that the typed in text appears on line 8 of the screen just like in Lucid Spreadsheet. When you press ENTER the typed in input jumps up into the field of the wide bar cursor.

B. Cursor Movement

1. Press ENTER a second time to move down to the 'Cpny:' field, or you can use the down arrow key, or the TAB key.

2. In View, the ENTER key moves you down a field just like the down arrow key, and the TAB key moves you to the right just like the right arrow key.

3. The right and left arrow keys move you right one field and left one field respectively, and the up arrow key moves you up a field.

4. The shift up arrow key moves you to the first field on the screen.

5. The shift down arrow key moves you to the last field on the screen.

C. More on typing in

1. Fill in the other fields in the screen, for this example use:

```
      Name and Address Input Screen 1
Name:Joe Orton
Cpny:Egg Productions Inc.
Street:1234 Cemetary Row
City:Washington      St:DC   Zip:20202
Ph W:                 H:
```

Put in any phone numbers you like.

2. Notice that now you are in View, you are unable to change the background prompts on the screen. The wide bar cursor can only access the parts of the screen that you defined as fields with square brackets when you were in TEXT.

3. If you see a mistake in a field after you have left it, you don't need to retype the whole thing. Simply move the wide bar cursor to that field and press F1 (Edit), and you can edit the field on line 8 just like in Lucid Spreadsheet.

D. Moving between records

1. When you have filled up the input screen with data, press **F4 (Next)**.

   The input data you have entered disappears from the screen, leaving only the background prompts. Notice that the record number next to the screen heading has changed from 1 to 2.

2. If you want to see record 1 again, just press **F3 (Prev)** to back up one record. You will see the stuff you just typed in to record 1.

   It's as simple as that!

E. Typing in examples

1. For our example, go ahead and type in a

few more names and addresses. Here are some examples:

```
Henrik Ibsen
Wild Duck Productions
2345 Baltic St
Atlantic City  NJ    60708

Anton Chekov
Cherry Orchard Farms
Route 1 Box 25
Fayetteville   GA    34545

George Shaw
Pygmalion Iron Works
2131 Whistler St
Detroit        MI    67890

Oscar Wilde
Trivial Publications
100 Wannemaker
Hollywood      CA    94292

Ron Feydeau
DOD Procurements
456 E. 456th St
Washington     DC    20456
```

2. After entering each name and address, remember to press F4 (Next) to go on to the next screen.

3. When you have entered about half a dozen names and addresses, you can try some other keys.

F. Goto

1. Hold down the Shift key and press the > (Goto) key. The screen says

```
Go to Record #:
```

2. Type in the number 1, and press ENTER. This moves you back to the first record you typed in. You can use 'Goto' to go to any record in the database.

G. Find

1. With the cursor in the Name: field, hold down the Shift key and press the ? (Find) key. The screen says

```
Find:
```

Type in

```
eau
```

The screen says

```
Find:eau
```

2. Press ENTER. If you typed in the examples we gave above, record number 6 will appear on the screen. Lucid Data found the eau in Ron Feydeau's name. Find looks forwards from the current record, but only in the field the cursor is resting in when you press the ? (Find) key. To find the next occurrence of eau simply press ? (Find) again. You

are offered eau as the default key (thing to be found). Just press ENTER. The screen says No match to indicate that it can't find any more eau's in the name field.

If a ? appeared on the bottom line when you pressed ? (Find), don't be concerned. It simply means that you were editing or changing at the time you pressed the ? key. Just press ENTER or ESC to get out of edit mode, and press ? (Find) again. Lucid Data will now behave as explained above.

H. More on moving between records

1. A helpful feature of > (Goto) is that just like in Lucid Spreadsheet, it remembers where you came from. What's more, it also remembers where you started a search. So to get back to where you started looking for eau simply press > (Goto). Screen says

   Go to Record #:1

   Simply press ENTER to get back to the first record.

2. Another way to get to the first record from any record in the database is to hold down the CTRL key and press the up arrow key. Just like in Lucid Spreadsheet, this will get you to the top of the data file, which in the case of View is record 1.

3. Also like in Lucid Spreadsheet, the CTRL down arrow will take you to the last occupied record in the file. Try holding down the CTRL key and pressing the down arrow key. Record 6 (or whatever was the last record you typed in) appears on the screen.

4. CTRL down arrow takes you to the last record with anything in.

   a. Say you happen to have cell DR9 (or some other cell not in your view screen) occupied. CTRL down arrow will take you to record 9, since row 9 of the data spreadsheet file is the last row with data in it. In this case, the data fields on the screen would be empty.

   b. So if pressing CTRL down arrow takes you to an empty record, it is not a mistake. It simply means that this record does have a field occupied, but it is not one of the fields that shows in this particular View screen.

III. Printing a mailing list

A. Designing a report template

A report template is similar in many respects to a View file, only instead of being used to put data into a database, it is used to extract selected data from the database.

1. Press F7 (Lucd) to get into the regular Lucid Spreadsheet mode.

2. Press > (Goto). Screen says:

   ```
   Goto: A1
   ```

   Backspace the A1 and type in:

   ```
   Goto: DR1
   ```

   DR1 is an easy cell to remember, since it stands for Data Report 1.

3. At cell DR1, type

   ```
   LIST.DO
   ```

   And press ENTER

4. Now you have the word LIST.DO in cell DR1. As far as Lucid is concerned it is just a regular label just like any other cell with alphabetic data in it. But as you know, it is also a legal Model 100 filename. We chose LIST.DO arbitrarily,

we could have used any legal Model 100 filename.

5. With the wide bar cursor on cell DR1, press F6 (Data). The bottom line of the screen says

```
View Rprt                    Text       Exit
 1    2    3    4    5    6    7    8
```

6. Press F6 (Text). After a moment the screen clears. You are now in TEXT, ready to type in the report template.

7. Type in the following example template:

```
[a#                                  ]<
[b#                                  ]<
[c#                                  ]<
[d#            ] [e#]   [f#          ]<
<
<
```

The < symbols in the example above represent the solid black triangular symbol achieved on the Model 100 by pressing ENTER.

Note that we have only put in field templates, with no background text. Report templates can have background text, but in this case none is needed.

Note also that we have put in an extra two ENTER symbols at the end. These are just passed through to the printer by the report writer, so each name and

address printed will be separated by two blank lines.

8. The first line of the template specifies that field A is to be printed. Since this template is to be used with the MAIL.CA data file, field A will contain a person's name in this example. Once you have designed a report template it can be used with any data file, but of course the information in the fields called for by the template should make sense in the layout specified by the template. That is to say, it would not be appropriate to use this template with the chemical formula example spreadsheet shown in the section on Sort.

9. The rest of the template prints out field B, the company name, field C, the street address, then all on one line fields D, E and F, which in MAIL.CA are the city, state and zip.

10. When you have typed in the example template press F8 (Exit) to get back to Lucid.

B. Setting up a Report Specifier Block

1. Why a Report Specifier Block?

   a. A report cannot be printed without a report template file. But a template file is not the only information Lucid Data needs to print a report.

   b. Lucid Data needs to know which records you want printed, and other (optional) information which we will discuss later.

   c. This information is contained in a *Report Specifier Block*, which is a column of cells in the Lucid Data spreadsheet.

   d. You have already made the first entry in your report specifier block. This is the template file name you typed in to cell DR1. Before you can print out your mailing list you must specify which records to print.

2. How to do it

   a. Move the wide bar cursor to cell DR2, and type in the following formula:

      +NOT(NUL(F#))

      This is the *selection criterion cell*, which specifies which records are to be printed.

In this example all records for which field F (the zip) has something typed into it will be printed.

b. If we had put in the formula

```
+NUL(F#)
```

Only those records which had no zip would have been printed. Since a record with nothing at all in it has no zip, this rather long report would consist mainly of blank paper!!

So the formula we used, by specifying NOT those empty records, leaves us only with those records which have at least a zip code.

c. If we had put in the formula

```
+NOT(NUL(A#))
```

We would have printed out all those records for which the name field was not blank. This would make sense, too, unless you had a company in your mailing list for which you didn't have a contact name.

C. Moment of truth

1. After typing in the selection criterion formula and pressing ENTER, press the up arrow key to move back to cell DR1, so it rests on LIST.DO.

2. Make sure your printer is hooked up, plugged in and on line with plenty of paper.

3. Press F6 (Data). The bottom line of the screen says:

```
View Rprt                          Text        Exit
 1    2     3     4     5     6     7     8
```

4. Press F2 (Rprt). The WAIT signal flashes in the bottom left of the screen while the printer prints out the report.

D. Multiple labels per line

As you probably noticed, the mailing labels appeared down the left hand side of the paper.

Often it is neccessary to print 3 or 4 labels wide on multiple width sticky labels. Here's how it's done with Lucid Data.

1. Move the cursor to cell DR5. This fifth cell in the Report Specifier Block contains the number

of records to print side by side in a report.

2. Simply type the number 3 and press ENTER. The value

3.00

Appears in cell DR5. If you are curious about what cells DR3 and DR4 are for, you could peek ahead at the reference section, under 'Contents of a Report Specifier Block'.

Alternatively you could keep going with this tutorial. The invoice example tells what they are for, too.

3. Move the wide bar cursor back to cell DR1, containing the report template file name.

4. Make sure your printer is hooked up, plugged in and on line with plenty of paper.

5. Press F6 (Data), then F2 (Rprt).

6. WAIT flashes in the bottom left of the screen while the printer prints the mailing list, three across.

LUCID DATABASE

Section 1 - Tutorial

Chapter Two

An Easier Mailing List

I. Description

A. Easier for the user.

1. This way is easier for you as the end user, but a little more complicated for you as the designer of the database.

2. After you have become familiar with the techniques, however, you will find that this method is the best.

B. Print directly from View.

1. The idea here is to print a report directly from View, without having to go back to Lucid Spreadsheet.

2. We are going to extend our View file template to include a second viewpoint (screen) which is tailored to print the mailing list, and which provides a kind of 'help screen', too.

II. Steps

A. Modify the view file

1. Press F8 (Exit) to go back to the Model 100 Main Menu.

2. Place the wide bar cursor on the file MAIL.DO. This is our view template file. ENTER. The screen shows the view template you typed in, in Chapter one.

```
    Name and Address Input Screen [# ]
Name:[a#                                ]
Cpny:[b#                                ]
Street:[c#                              ]
City:[d#              ] St:[e#] Zip:[f# ]
Ph W:[g#              ] H:[h#           ]
```

3. Move the cursor down to line 7. Type in a new line 7 so now the screen says:

```
    Name and Address Input Screen [# ]
Name:[a#                                ]
Cpny:[b#                                ]
Street:[c#                              ]
City:[d#              ] St:[e#] Zip:[f# ]
Ph W:[g#              ] H:[h#           ]
Please press F5 (Vwpt) to print
```

This new line is just background data. We have not added a field yet.

4. With the cursor at the end of the View file, hold down the CODE key and press the 0. This produces the paragraph symbol at the cursor. This CODE-0 symbol delimits the first viewpoint screen in the view file from the second. You can have up to 255 different viewpoints in a single view file, each separated from the other by CODE-0 symbols.

5. Now we can go ahead and type in the second viewpoint, using which we will print out the mailing list. After the CODE-0 symbol, type this:

```
        Printing a Mailing List

Place the cursor here-->[DR1     ]
and press the PRINT function key.
```

B. Printing the mailing list

1. When this screen is called up in View (by pressing F5 (Vwpt)), the cursor will automatically be in the DR1 field. This method will work because Lucid has the feature that pressing the PRINT key in View is the same as pressing F6 (Data) then F2 (Rprt).

    a. Just like with the F6/F2 method, when you press PRINT in View, Lucid will print a report if the cursor is resting on a report template file name.

    b. Note: the reference in the only field in this viewpoint is not a data reference but a regular cell reference.

    c. When you have typed in the second viewpoint template shown above press F8 (Exit) to return to the Model 100 Main Menu.

2. Print from the view file

    a. Move the wide bar cursor to MAIL.CA and

press ENTER. You will find yourself back at cell DR1.

b. Press F6 (Data), then F1 (View). The bottom line of the screen says:

```
View file name: MAIL
```

Just press ENTER. Now you are back in the view file, but notice that the new line 7 that you just typed in in TEXT now prompts you to press F5 (Vwpt) to print a report.

c. Press F5 (Vwpt). The screen says

```
Printing a Mailing List

Place the cursor here-->LIST.DO
and press the PRINT key.
```

d. Make sure your printer is hooked up, plugged in and on line with plenty of paper.

e. The cursor is already on LIST.DO, so press the PRINT function key. The WAIT signal flashes in the bottom left of the screen while the printer prints out the mailing list.

f. Press F8 (Exit) to get back to the Model 100 Main Menu.

LUCID DATABASE

Section 1 - Tutorial

Chapter three

Sending Form letters to a Mailing List

I. Description.

A. Two ways

1. There are two ways to send form letters to a mailing list using Super Rom. The first way is to use Lucid Data to merge into a form letter in a report template.

2. The second way is to use Write Rom to format into a letter with 'true match and fill'. This method is discussed in the next section.

B. How they differ

1. The difference is in fields that are merged into the body of the letter. Lucid Data will print the entire length of the field defined in the template.

2. If you left 20 spaces for the name field and the name was actually only 10 characters long, Lucid Data would leave 10 trailing spaces after the name before the next piece of text.

3. This means that on lines in the letter where a field is followed by other text,

the output can look as unsightly and amateurish as some of the stuff that you get in the mail, kind of like this:

```
Dear Mr. Biggs
We are confident that the Biggs        family
will be amazed at the savings that can be
achieved by using our Super Scooper.
```

Notice the large blanks after the name Biggs. True match and fill dynamically reformats the letter each time it is printed so those spaces are eliminated, and the letter looks as if it is to only one recipient.

4. The first method (without true match and fill) is the way to go if no variable text (fields) appear in the body of the letter, but only in the name and address lines at the top, which each occupy a line on their own.

II. Steps - the first method:

The first example is without match and fill

A. Prepare the report template file

1. First we need to type up a sample letter. For Lucid Data, the letter must be pre-formatted (with a carriage return at the end of each line). We are going to write it in TEXT, format it to RAM with Write Rom, then access it with Lucid Data to output it.

2. Press F8 (Exit) to return to the Model 100 Main Menu. Place the cursor on Super and press ENTER.

3. Select F2 (Write Rom). The label line says:

```
Rplc Name New  Map  Kill Phne Set  Exit
 1    2    3    4    5    6    7    8
```

4. Press F3 (New). The bottom line of the screen says:

```
New file name:
```

5. Type in a file name for your master letter.

```
New file name: MSTR
```

6. The screen clears and you are in TEXT ready to type in the following sample letter:

```
.up 10<
[a#                              ]<
[b#                              ]<
[c#                              ]<
[d#            ] [e#]   [f#   ]<
.up 3<
Dear [a#                      ]<
We are so glad you have decided to join
our 'Writing Plays for Cold Cash' home
study program.  You will be getting your
first customized study package in a few
days.  We look forward to a happy
association with you.<
Yours sincerely,<
<
<
W. Shakespeare.<
Pres.<
```

The < symbols in the example above represent the solid black triangular symbol achieved on the Model 100 by pressing ENTER.

7. After typing the sample letter, press F8 (Exit) to return to the Write Rom menu.

B. Creating the merge document.

1. Put the cursor on the MSTR.DO filename and press the PRINT function key. The bottom line of the screen says:

```
Go    Feed Outp Code Qty   CRLF Paus Exit
 1     2    3    4    5     6    7    8
```

2. Press F3 (Outp). Label line says:

```
Output to: LPT:
```

3. Backspace out the LPT: and type in:

```
Output to: MRGE
```

And press ENTER. This will format the letter and send it to a file called MRGE.DO. This formatted file is the one we will want to use for merging with Lucid Data.

4. Press F1 (Go). The screen will flash WAIT in the bottom left corner, then redisplay the Write Rom menu, with the additional file MRGE.DO.

5. Press F8 (Exit). You will see the Model 100 Main Menu.

C. Set the report specifier block

1. Move the wide bar cursor to MAIL.CA and press ENTER.

2. If you don't come up in the 'Printing a Mailing List' screen, press F6 (Data), F1 (View), ENTER (for filename MAIL), then F5 (Vwpt) to get back to the 'Printing a Mailing List' screen.

3. The report name was 'LIST.DO'. We want to use MRGE.DO instead, so just type in

```
MRGE.DO
```

And press ENTER.

4. Press F7 (Lucd) to get back to Lucid spreadsheet mode, and move the wide bar cursor down to cell DR5.

5. This cell should have 3.00 in it. Whether it has or not, type ! and press ENTER. This is the standard setting for 'number across'.

6. Hold down the SHIFT key and press the up arrow. This will get you back to cell DR1.

D. Print the report

1. Press F6 (Data) then F2 (Rprt). The bottom left of the screen will flash WAIT while the letters are being printed.

2. Press F8 (Exit) to get back to the Model 100 Main Menu.

III. Printing a Form Letter With Match and Fill

This requires the use of both the Lucid Data and the Write Rom sections of Super Rom.

We are going to print our mailing list to a RAM file, then use the Merge feature of Write ROM to print the list with true match and fill.

A. Edit LIST.DO

1. From the Main Menu, move the wide bar cursor to the file LIST.DO. Press ENTER.

2. Edit the file to look like this:

```
[a#                                    ]<
[b#                                    ]<
[c#                                    ]<
[d#                ] [e#]   [f#        ]<
[a#                                    ]<
```

Note: the < mark represents the solid triangle achieved by pressing ENTER.

3. Observe that w edited LIST.DO by making a copy of the first line down at the bottom of the screen, and taken off the last two carriage returns from the template. This gives the name a second time so we can use it in the body of our form letter, and makes the labels follow each other immediately with no empty lines.

4. After making these changes, press F8 (Exit) to return to the main menu. Next we must use this template to print a merge file to RAM.

B. Change the output

1. Place the cursor on MAIL.CA and press ENTER. If you find yourself in View, press F7 (Lucd) to get back to the spreadsheet.

2. Press the PRINT function key, then F3 (Outp). The bottom line of the screen says:

```
Output to: LPT:
```

3. You might remember changing a prompt like this in a previous section, but that was the output for Write Rom. This time we are changing the output for Lucid. Change the bottom line to read

```
Output to: MLIST
```

4. This will be a master merge list for the Write ROM merge function. Press ENTER, then F8 (Exit) to return to Lucid Spreadsheet. Next we must print this report.

5. To recapitulate, we have a data file, MAIL.CA. We are about to print a report, using the template LIST.DO, and the report will be printed to a file called MLIST, which will consist of multiple five line addresses and names.

C. Printing the report to a RAM file

1. Next we need to fix the template name back to LIST.DO. Move the cursor to cell DR1 and type in LIST.DO. Then press ENTER.

2. To print the MLIST file, press F6 (Data) then F2 (Rprt). The bottom of the screen flashes WAIT while the file is being built.

3. When the WAIT stops flashing, press F8 (Exit) to return to the Model 100 Main Menu. Next we must alter the master merge document to work with Write Rom rather than Lucid Data.

4. At the Model 100 Main Menu, move the wide bar cursor to MSTR.DO and press ENTER.

5. Alter the file to look like the example on the page following:

The @ signs in the example which follows are achieved by holding down the GRPH key and pressing the M. They won't look like @ signs on your screen, but like tiny houses.

Example:

```
.mg MLIST
.up 10<
@<
@<
@<
@<
.up 3<
Dear Friend,
<
We are so glad you have decided to join our
'Writing Plays for Cold Cash' home study
program.  You will be getting your first
customized study package in a few
days.  We look forward to a happy
association with you.  If you apply
yourself and learn all we have to offer,
soon the name @ will be on theatre marquees
throughout the world.<
Yours sincerely,<
<
<
W. Shakespeare.<
Pres.<
```

The < symbols in the example above represent the solid black triangular symbol achieved on the Model 100 by pressing ENTER.

6. When each GRPH M is encountered by Write Rom when printing the letter, it grabs the next line from the merge list. Note that there are five GRPH M's in the letter, corresponding to the five lines for each address in the report file template, LIST.DO.

7. Press F8 (Exit) to return to the Model 100 Main Menu. Move the wide bar cursor to Super and press ENTER.

D. Printing out to the mailing list

1. Select F2 (Write Rom). Because we have put the .mg command at the top of the master document file, Write Rom will automatically perform the merge for us. First we must redirect Write Rom's output to the printer.

Press the PRINT function key, then F3 (Outp). The bottom line of the screen says

```
Output to: MRGE
```

3. Backspace out the MRGE and change it to read

```
Output to: LPT:
```

and press ENTER.

4. Make sure your printer is hooked up, plugged in and on line with plenty of paper.

5. Move the wide bar cursor to MSTR.DO and press F1 (Go). (If F1 says Rplc not Go, press the PRINT function key first).

6. The printer prints out the customized form letters with true match and fill.

E. Completed example

On the page following is a sample of a printed out letter with true match and fill.

True match and fill example:

Henrik Ibsen
Wild Duck Productions
2345 Baltic St.
Atlantic City NJ 60708

Dear Friend,

We are so glad you have decided to join our 'Writing Plays for Cold Cash' home study program. You will be getting your first customized study package in a few days. We look forward to a happy association with you. If you apply yourself and learn all we have to offer, soon the name Ibsen will be on theatre marquees throughout the world.

Yours sincerely,

W. Shakespeare.
Pres.

LUCID DATABASE

Section 1 - Tutorial

Chapter four

Sales and Invoice System

I. System Overview

A. Definition

1. The Lucid Database is extremely versatile. The example which follows illustrates what is called a relational application. While the example will teach you completely how to construct and work a relational system it in no way exploits the limits of the capability of the database.

2. The relational example you will study is a system where you can enter orders, keep inventory, print invioices as well as keep a record of all sales.

3. You will see that it draws information from different files and when it compiles records it saves memory by not repeating any information in a record file that was drawn from another file.

4. Once you have experimented with our example you will be able to design your own system with as many information source files and as many report files as you like depending on your application.

B. Example description

1. This system consists of three data files, associated with one view file each, plus one report template file which contains an invoice form template.

2. These are the files:

a. CUST.DO contains an input screen to add new customers to the customer list, find existing customers and edit their information.

b. CUST.CA contains a customer list.

c. INVEN.DO contains an input screen to add new items to the inventory, find existing inventory items, and edit their information.

d. INVEN.CA contains a list of inventory item ID's, names and sales prices.

e. SALES.DO contains an input screen to record sales.

f. SALES.CA contains a record of all sales.

g. INVOIC.DO contains a report template for printing invoices.

II. Step-by-step procedure.

A. View file CUST.DO

1. From the Model 100 Main Menu, place the wide bar cursor on Super and press ENTER. Screen says:

```
TRS-80 Model 100 Software
Copr. 1985 PCSG (V1.1)

        F1 == Lucid
        F2 == Write Rom
        F3 == Thought
        F4 == Lucid Data
```

2. Press F4 (Lucid Data). Bottom line of screen says:

```
Lucid File?
```

3. Type

   CUST

And press ENTER. Bottom line of screen says:

```
View file name:
```

4. Type

   CUST

(again) and press ENTER.

You have now created two new files, first

was the Lucid file, CUST.CA, then the view file, CUST.DO.

5. The screen clears. You are now in TEXT ready to type in the customer input screen. Make it look like this:

```
          Customer Information  [#]

Customer I.D.:[A#  ]
Customer name:[B#                    ]
```

6. When you have typed this in, press F8 (Exit). The screen says:

```
          Customer Information  1

Customer I.D.:
Customer name:


Edit Dupe Prev Next Vwpt Text Lucd Exit
```

You are now in View, working with the screen you just designed, and ready to start entering data to the data file CUST.CA that you just created.

B. Data file CUST.CA

1. These are the fields you just created in your view file CUST.DO:

   Field A. Customer I.D.
   Field B. Customer name
   Other fields. You could have put in a customer address and so on, but for

the sake of this example, we have left out all the other customer information to avoid clutter.

2. Type in the following sample data:

```
          Customer Information  1

Customer I.D.:ANT
Customer name:Anthony Trollope


Edit Dupe Prev Next Vwpt Text Lucd Exit
```

3. Then press F4 (Next) to go on to the next record. Put in three more sample customers, pressing F4 (Next) after each one. Use the following I.D.'s and names:

```
MRS
Mrs Gaskell

HEN
Henry James

SAM
Samuel Butler
```

4. Press F8 (Exit) to get back to the Model 100 Main Menu. Now we have set up our customers, we are ready to set up our inventory file.

C. View file INVEN.DO

1. From the Model 100 Main Menu, place the wide bar cursor on Super and press ENTER. Screen says:

```
TRS-80 Model 100 Software
Copr. 1985 PCSG (V1.1)

        F1 == Lucid
        F2 == Write Rom
        F3 == Thought
        F4 == Lucid Data
```

2. Press F4 (Lucid Data). Bottom line of screen says:

```
Lucid File?
```

3. Type

```
INVEN
```

And press ENTER. Bottom line of screen says:

```
View file name:
```

4. Type

```
INVEN
```

(again) and press ENTER.

You have now created two new files, first was the data file, INVEN.CA, then the view file, INVEN.DO.

5. The screen clears. You are now in TEXT ready to type in the inventory input and update screen. Make it look like this:

```
        Inventory Input and Update    [#]

Item I.D.:[A#   ]
Item description:[B#                    ]
Selling price:[C#          ]
```

6. When you have typed this in, press F8 (Exit). The screen says:

```
        Inventory Input and Update    1

Item I.D.:
Item description:
Selling price:


Edit Dupe Prev Next Vwpt Text Lucd Exit
```

You are now in View, working with the screen you just designed, and ready to start entering data to the data file INVEN.CA that you just created.

D. Data file INVEN.CA

1. These are the fields you just created in your view file INVEN.DO:

   Field A. Item I.D.
   Field B. Item Description
   Field C. Item sales price
   Other fields. You could have put in

current stock, reorder level, reorder quantity, supplier I.D., taxable (y/n) and so on, but for the sake of this example, we have left out all the other product information to avoid clutter.

2. Note that the selling price field is numeric (a dollar amount). View defaults to label type input, which means that in order for the price you type in to be treated as a number for totalling etc, you would have to precede all your inputs with a plus sign to force numeric typing. To avoid this we will now specify a special default type for field C.

   This is done by putting an example of the format we desire into cell C250 in the spreadsheet INVEN.CA. This sample type must always go in row 250 of the field we wish to specify, which is reserved for this purpose in Lucid Data.

   a. Press F7 (Lucd). The screen changes to the familiar Lucid spreadsheet format, with the wide bar cursor at cell A1.

   b. Press the > Goto key, SHIFT and >. The bottom line of the screen says:

      ```
      Goto: A1
      ```

   c. Type in

      ```
      Goto: C250
      ```

And press ENTER

d. The screen displays cell C250. Type in a dummy number, for example 0 (zero). Press ENTER.

e. Since this is a dollar format, we now format the cell by pressing F7 (Sel). The bottom line of the screen says:

```
Range C250:C250
```

Press ENTER

f. The bottom line of the screen says:

```
Disp Wdth Ptct Unpt Copy Cut  Sort Exit
 1    2    3    4    5    6    7    8
```

g. Press F1 (Disp). The bottom line of the screen says:

```
     #.## ###-     $####      ,### Exit
 1    2    3    4    5    6    7    8
```

h. Press F5 ($###) to format the cell with a leading dollar sign, then press F8 (Exit). The format is now set, so we can proceed to type in data.

i. Press CTRL and the up arrow key simultaneously to get back to cell A1, then press F6 (Data), then F1 (View). The screen says:

```
View file name: INVEN
```

Press ENTER. You are now back in the Inventory Input and Update screen ready to type in some data.

3. Type in the following sample data:

```
        Inventory Input and Update   1

Item I.D.:PEN
Item description:Osmiroid Fountain Pen
Selling price:    2.29


Edit Dupe Prev Next Vwpt Text Lucd Exit
```

Press ENTER twice after typing each field. The first time exits from EDIT, the second moves down a field (ENTER then TAB would move right one field, which would work here, too)

4. Then press F4 (Next) to go on to the next record. Put in five more sample products, pressing F4 (Next) after each one..... Use the following I.D.'s, descriptions and prices:

```
PNC
Faber Castell Pencil
0.19

PAD
Big Chief Yellow Pad
0.78
```

```
BLT
Blotting Paper
0.09

CIG
Packet of Cigarettes
2.10

BDY
Hip Flask of Brandy
3.30
```

5. Press F8 (Exit) to get back to the Model 100 Main Menu. Now we have set up our inventory file, we are ready create our sales input screen and record some sales.

E. View file SALES.DO

1. From the Model 100 Main Menu, place the wide bar cursor on Super and press ENTER. Screen says:

```
TRS-80 Model 100 Software
Copr. 1985 PCSG (V1.1)

        F1 == Lucid
        F2 == Write Rom
        F3 == Thought
        F4 == Lucid Data
```

2. Press F4 (Lucid Data). Bottom line of screen says:

```
Lucid File?
```

3. Type

   SALES

   And press ENTER. Bottom line of screen says:

```
View file name:
```

4. Type

   SALES

   (again) and press ENTER.

   You have now created two new files, first was the data file, SALES.CA, then the view file, SALES.DO.

5. The screen clears. You are now in TEXT ready to type in the sales input screen. Make it look like this:

```
        Sales Input Screen      [#]<
Customer:<
I.D.:[A# ]  Name:[AA1
Product:<
I.D.:[B# ]  Desc:[AA2
Qty: [C# ]  at:[AA3    ] Extn:[Z1
```

6. When you have typed this in, press F8

(Exit). The screen says:

```
        Sales Input Screen     1

Customer:
I.D.:          Name:
Product:
I.D.:          Desc:
Qty:           at:           Extn:

Edit Dupe Prev Next Vwpt Text Lucd Exit
```

You are now in View, working with the screen you just designed, getting ready to start entering data to the data file SALES.CA that you just created.

F. Data file SALES.CA

1. These are the fields you just created in your view file INVEN.DO:

   Field A. Customer I.D.
   Virtual field AA1. Customer name
   Field B. Product I.D.
   Virtual field AA2. Product description
   Field C. Quantity purchased
   Virtual field AA3. Price each
   Virtual field Z1. Extended price.

   We have not met virtual fields before, so lets look at each of the fields in more detail.

   a. Field A, customer I.D.
      This is a regular field like the ones

in the other input screens we have done. Anything you type in to it will go into field (column) A of SALES.CA, in the current record (row), the number is displayed in the top left of the screen in the [#] field.

b. Virtual field AA1. AA1 is a cellref rather than a dataref. Since it specifies an individual row, it can't be used to input data into multiple records. It is a display only field. We will use it to get from the CUST.CA file the customer name corresponding to whatever customer I.D. is recorded in field A. To achieve this we must put a *join* formula into cell AA1.

(1) Press F7 (Lucd). The screen changes to the familiar Lucid spreadsheet format, with the wide bar cursor at cell A1.

(2) Press the > (Goto) key, SHIFT and >. The bottom line of the screen says:

```
Goto: A1
```

(3) Type in

```
Goto: AA1
```

And press ENTER

(4) The screen displays cell AA1.

Type in the following formula:

```
+JYN("CUST",A#,A#,B#)
```

and press ENTER.

(5) This formula will take the contents of cell A# in the SALES.CA and go to CUST.CA and find a match in field A. When it finds the match, it will return the contents of field B in the record of the match. This (the customer name) is displayed as the result of the formula.

(6) Since we are in spreadsheet mode rather than in View, the message

DATA

appears in the cell. JYN only has a valid result in View.

c. Field B. Product I.D.

This is a regular view field just like in the other screens we created.

d. Virtual field AA2. Product description.

This is a virtual field, a display only field like the AA1 field above. Just like for the customer name, we

need to put a join formula into cell AA2.

(1) Move the wide bar cursor down one line to cell AA2 and type in the following formula:

```
+JYN("INVEN",B#,A#,B#)
```

and press ENTER.

(2) This formula will take the contents of cell B in the SALES.CA and go to INVEN.CA and find a match in field A. When it finds the match, it will return the contents of field B in the record of the match. This (the product description) is displayed as the result of the formula.

(3) Since we are in spreadsheet mode rather than in View, the message

DATA

appears in the cell. JYN only has a valid result in View.

e. Field C. Quantity purchased

This is a regular view field just like in the other screens we created.

Since it is a unit quantity field, we need to format it as a numeric type

with no decimal places.

(1) Press the > Goto key, SHIFT and >. The bottom line of the screen says:

```
Goto: A1
```

(2) Type in

```
Goto: C250
```

And press ENTER

(3) The screen displays cell C250. Type in a dummy number, for example 0 (zero). Press ENTER.

(4) We now format the cell by pressing F7 (Sel). The bottom line of the screen says:

```
Range C250:C250
```

Press ENTER

(5) The bottom line of the screen says:

```
Disp Wdth Ptct Unpt Copy Cut  Sort Exit
 1    2    3    4    5    6    7    8
```

(6) Press F1 (Disp). The bottom line of the screen says:

```
     #.## ###-      $####       ,### Exit
 1    2    3    4    5    6    7    8
```

(7) Press F2 (#.##). The bottom line of the screen says:

```
Decimal places? 2
```

(8) Backspace out the 2 and replace it with a 0, then press ENTER. The bottom line of the screen says:

```
     #.## ###-      $####        ,### Exit
1     2    3     4     5     6     7     8
```

Press F8 (Exit).

(9) Press the > (Goto) key, then ENTER to return to cell AA2.

f. Virtual field AA3. Price each.

This is a virtual field, a display only field like the AA1 and AA2 fields above. Just like for the customer name, we need to put a join formula into cell AA3.

(1) Move the wide bar cursor down one line to cell AA3 and type in the following formula:

```
+JYN("INVEN",B#,A#,C#)
```

and press ENTER.

(2) This formula will take the contents of cell B in the SALES.CA and go to INVEN.CA and

find a match in field A. When it finds the match, it will return the contents of field C in the record of the match. This (the sales price per unit) is displayed as the result of the formula.

(3) Since we are in spreadsheet mode rather than in View, the message

DATA

appears in the cell. JYN only has a valid result in View.

g. Virtual field Z1. Extended price.

This is a virtual field, a display only field like the AA1, AA2 and AA3 fields above. But we have to put a different formula in to get the extended price.

(1) Move the wide bar cursor up two and left one to cell Z1 and type in the following formula:

+AA3*C#

and press ENTER.

(2) This takes the contents of cell AA3, which is the unit price of the product in the current record, and multiplies it by the contents of field C in the sales

record, which is the quantity purchased. This amount (unit price multiplied by quantity purchased) gives the extended price, i.e. the total price for this record.

(3) All we need to do now is to format this virtual field. Since we will not be entering data into it (it is a display only field), we don't need to format it with a dummy at row 250. It will suffice to format the individual cell Z1.

(4) Since we have already been through cell formatting step by step twice already we'll just give it in quick reference format here:
Press F7 (Sel)
Screen says Range Z1:Z1
Press ENTER
Press F1 (Disp)
Press F5 ($###)
Press F8 (Exit)

2. Entering sample data

Now we have set up all the supporting files and the input screens and formats, we can go ahead and sell some stuff.

One of the most remarkable features of Lucid Data is that nothing is set in concrete. If you want to go back and

add a field to the input screen (e.g. salesman I.D.) there is no problem. Just go into TEXT and make the changes. The data file will not need converting or anything like that.

a. Press F6 (Data) then F1 (View). Press ENTER to accept the view file SALES.

Note that you can have any number of view files associated with a single data file, but since you can have over 200 viewpoints in a single view file, it makes more sense to keep all the input screens in a single view file. You can achieve modularization by creating multiple data files taking advantage of Lucid Data's ability to draw from any number of files.

The screen says:

```
Sales Input Screen    1

Customer:
I.D.:        Name:
Product:
I.D.:        Desc:
Qty:         at:          Extn:    $0.00

Edit Dupe Prev Next Vwpt Text Lucd Exit
```

b. Type in the customer I.D.

HEN

Press ENTER. Notice that the screen automatically shows the customer name,

```
Customer:
I.D.:HEN      Name:Henry James
```

c. Press ENTER again. The wide bar cursor moves to the product I.D. field. Type in a product I.D. For example:

PEN

and press ENTER. Notice again that the product description field is automatically updated, and so is the unit price field.

```
Product:
I.D.:PEN      Desc:Osmiroid Fountain Pen
Qty:          at:    2.29   Extn:$0.00
```

Lucid Data is going to the inventory file and looking up the I.D to find the corresponding description which it displays on the screen.

d. Press ENTER to move to the quantity field. Type in the number

3

and press ENTER. Notice that not only is the Qty: field updated, but so is the extension field, giving the correct amount. The screen now looks like this:

Note: if the quantity field is not updated, this means that somewhere a number has been entered as a label. Check the unit price in the INVEN.CA file.

```
        Sales Input Screen    1

Customer:
I.D.:HEN     Name:Henry James
Product:
I.D.:PEN     Desc:Osmiroid Fountain Pen
Qty:      3  at:    2.29  Extn:     $6.87

Edit Dupe Prev Next Vwpt Text Lucd Exit
```

e. Press F4 (Next) to move on to the next record.

f. Press F2 (Dupe). This automatically duplicates the HEN I.D. and the name Henry James. Press ENTER to move on to the product I.D. field.

g. Type in the code PAD and press ENTER. The screen displays the Yellow Pad product and it's price. Press ENTER to move to the next field.

h. Put ten (10) for the quantity. The correct extension is shown.

i. Go ahead and type in some more stuff for Henry James and the other novelists. Sell each of them a few things so it is more interesting when we come to print invoices. Don't forget to press F4 (Next) between each item.

G. Report Template File INVOIC.DO

Note: the < mark represents the solid triangle achieved by pressing ENTER.

You might remember from the mailing list example that in order to print a report you must have

a report specifier range
a report template file.

First we will prepare the report template file.

1. Press F7 (Lucd) to get into the spreadsheet SALES.CA.

2. Use the > (Goto) key to go to cell DR1. Remember that by convention we start our first report specifier range at cell Data Report 1.

3. Type in the report template file name:

   INVOIC.DO

   And press ENTER. Then press F6 (Data) followed by F6 (Text).

4. The screen clears and you find yourself in TEXT. Type in the following example. Note that where we have <CODE-0> you should not copy out the whole thing, just tap the 0 (zero) key while holding down the CODE key.

```
[C#   ] [AA2                                ]
 [AA3     ]    [Z1           ]<
<CODE-0><
<CODE-0><
                    Sample Invoice Form for
Lucid Data<
<CODE-0><
                    Our Terms are Net 30
Days<
<CODE-0><
To:  [AA1                              ]
   Invoice # [AA5 ]<
<CODE-0><
<
                                          Total
due             [AA4           ]<
.PAGE<
```

a. The first line is the line item template. The four fields are

   C# Quantity sold
   AA2 Item description
   AA3 Unit price
   Z1 Extended price

   The line item template is terminated by the <CODE 0>.

b. The second template is the grand total template. We leave that empty, but we must put the <CODE-0> marker in.

c. The third template is the page header template. We put the report title in there, but there are no fields in it.

It too is terminated with a <CODE-0>.

d. The fourth template is the page footer template. This is just some more background information for the invoice form, which could be pre-printed instead. It is terminated with a <CODE-0>.

e. The fifth template is the Break 1 header template. We are going to use this to address the invoice. We only have the customer's name on file, but if we had the address it could go here too. The invoice number is accessed by the virtual field AA5. We will fill that cell in later. The break 1 header template, like all the rest is terminated by a <CODE-0>.

f. The sixth template is the Break 1 footer template. This is our last template in this file, though we could have a set of Break 2 templates if we needed them.

The first line of this template is empty, to provide a line of separation between the group of line items and the grand total.

The third line of this template is a dot command (.PAGE) to force a page feed before going on to print the next invoice.

The second line prints the total due. The field we use for this is field

AA4. This is a virtual field, so we must put a formula in it.

(1) Press F8 (Exit) to return to the Lucid spreadsheet.

(2) Use > (Goto) to move to cell AA4.

(3) Type in the following formula:

```
+TL1(Z#)
```

and press ENTER. This will accumulate the sum of the extended prices, resetting to zero at the beginning of each invoice, because it is a Break 1 subtotal.

(4) Format this cell with F7 (Select), ENTER, F1 (Disp), F5 ($#.##), F8 (Exit).

(5) While we are here, we must also put a formula into the cell referenced by the invoice number field, cell AA5. Press the down arrow key to move to cell AA5.

(6) Type in the following formula:

```
+NB1
```

And press ENTER. This will print the number of break 1's that have occurred, which will provide sequential numbering for the

invoices.

(7) Format this cell with F7 (Sel), ENTER, F1 (Disp), F2 (#.##), 0 (zero decimal places), F7 (,###), F8 (Exit).

6. The report template name in cell DR1 filled the first cell in our report specifier block. Next we need to fill in the rest of the report specifier block.

   a. Press the > (Goto) key then ENTER to move the cursor back to cell DR1, then the down arrow to get to cell DR2.

   b. We must put a selection criterion in cell DR2. Type:

      +NOT(NUL(A#))

      And press ENTER. The cell shows a value of -1, which is OK. This will print all records for which we have provided a customer I.D.

   c. Next we need the Break 1 criterion. Press the down arrow and type in this formula:

      +CHG(A#)

      This will invoke a Break 1 each time

the customer I.D changes. This is OK. It will be putting all the sales for a customer on a single invoice, then starting a new invoice (because of the .PAGE in the break 1 footer) for the next customer I.D. Note that all the sales for a particular customer must be next to each other, or else that customer will get a different invoice for each cluster of sales. The sales for each customer can easily be grouped together by sorting the sales data file before printing the invoices.

d. We leave cell DR4 blank, since we do not need a second level of subtotal breaks in this report.

e. Put a 1 into cell DR5. This is always 1 except when we are printing mailing labels next to each other.

f. Put 1000 into cell DR6. This is the starting count for the Break 1 counter. The count is accessed by the function +NB1, which we put into cell AA5. This cell is not updated by Lucid, it provides a base count. If want to maintain sequential numbering, you must update this cell with the number of the last invoice printed+1 at the end of each run of invoices.

g. Cell DR7 doesn't concern us, since it is the starting Break 2 count, and we are not using the formula +NB2

anywhere in our report.

h. Much the same goes for cell DR8, which is the starting page count. The page count is accessed by the formula +NBP, which we are not using in this report.

i. Put 66 into cell DR9. This is the number of lines per page. If you are printing your template onto pre-printed invoice forms less than 11 inches long, change this figure to the length of the form in inches multiplied by 6. This is because there are 6 lines to an inch.

j. Put 4 into cell DR10. This is the left margin. Use trial and error to determine the optimal left margin for your printer.

This is what your report specifier block should now look like:

```
        DR1        DR2        DR3      DR4
001 INVOIC.DO Report template file name
002     -1.00 Selection criterion
003   *Data*  Break 1 criterion
004           Break 2 criterion
005      1.00 Number of columns of label
006      1000 Starting break 1 count
007           Starting break 2 count
008           Starting page count
009     66.00 Number of lines per page
010      4.00 Left margin
```

7. Printing the invoices

   a. Move the wide bar cursor back to cell DR1.

   b. Make sure your printer is hooked up, plugged in and on line with plenty of paper.

   c. Press F6 (Data). The bottom line of the screen says:

```
View Rprt                    Text       Exit
 1    2    3    4    5    6    7    8
```

   d. Press F2 (Rprt). The WAIT signal flashes in the bottom left of the screen while the printer prints out the report.

   e. Notice that an extra blank invoice is printed at the end. This is because Lucid Data always ends a report with a Break 2 footer followed by a Break

1 footer followed by a grand total template. The break 2 and grand total templates are empty in this example, but the break 1 footer has a .PAGE command in it that forces the spurious blank invoice.

8. Printing invoices directly from View

Just like with the mailing list, you can add a viewpoint to your view file (SALES.DO) which allows you to print reports without leaving view, simply by pressing the PRINT key.

a. Press F8 (Exit) until you are back at the Model 100 Main Menu.

b. Move the wide bar cursor to SALES.DO and press ENTER.

c. Add a prompt line to the end of the first viewpoint, then put a <CODE-0> viewpoint separator, then a second viewpoint screen. The amended file should look like this:

```
        Sales Input Screen     [#]<
Customer:<
I.D.:[A# ]  Name:[AA1                    ]<
Product:<
I.D.:[B# ]  Desc:[AA2                    ]<
Qty: [C# ]  at:[AA3    ] Extn:[Z1        ]<
Press F5 (Vwpt) to print invoices<
<CODE-0><
        Invoice Printing Screen<
<
<
```

```
<
Place the cursor here-->[DR1     ]<
And press the PRINT function key to<
print invoices.<
```

d. After making the changes, press F8 to exit from TEXT to the Model 100 Main Menu.

e. Move the wide bar cursor to SALES.CA and press ENTER.

f. Press F6 (Data) then F1 (View). Press ENTER to get the view file SALES.

g. The new prompt line should appear at the bottom of the first screen, and when you press F5 (Vwpt), the following screen should appear:

```
Invoice Printing Screen


Place the cursor here-->INVOIC.DO
And press the PRINT function key to
print invoices.
```

h. Make sure your printer is hooked up, plugged in and on line with plenty of paper.

i. Press the PRINT function key to print the invoices.

9. Printing an individual invoice for a

specified customer.

In order to do this we need to change the selection criterion to pick out one customer I.D. rather than any non blank customer I.D.

We also need to add to the view template file to allow the operator to specify which customer I.D. they want to print.

a. Press F7 (Lucd) to access the report specifier block.

b. Move the wide bar cursor to cell DR2. Type in the following formula:

+A#=AA6

and press ENTER. Note that cell AA6 is where we are going to put the key customer I.D.

c. Press F8 (Exit) to return to the Model 100 Main Menu.

d. Move the wide bar cursor to SALES.DO and press ENTER to edit it using TEXT.

e. Change the second viewpoint to look like this:

```
        Invoice Printing Screen<
<
Type the customer I.D. here: [AA6 ]<
<
```

```
Then place the cursor here-->[DR1     ]<
And press the PRINT function key to<
print an invoice.<
```

f. As you can see, we have referenced the virtual field AA6 here. Since cell AA6 is an input field, we don't need to do anything more with it. It will be filled in by the operator when they want to print an invoice.

g. Press F8 (Exit) to return to the Model 100 Main Menu, then place the wide bar cursor on the file SALES.CA and press ENTER.

h. Press F6 (Data) then F1 (View). Press ENTER to get the view file SALES.

i. Press F5 (Vwpt) to get the invoice printing screen, and type in a customer I.D., for example:

```
        Invoice Printing Screen

Type the customer I.D. here: HEN

Then place the cursor here-->INVOIC.DO
And press the PRINT function key to
print an invoice.
```

j. Type in HEN to print an invoice for Henry James, then press ENTER or the down arrow key to move the wide bar cursor to the INVOIC.DO template file name.

k. Make sure your printer is hooked up, plugged in and on line with plenty of paper.

l. Press the PRINT function key to print out just one invoice for Henry James.

m. If there were multiple items for Henry James, separated by items for other novelists, more than one invoice will print. You can consolodate all the items for Henry James into one invoice by going to the spreadsheet and sorting the records by customer I.D.

10. Remember that if you design a report that requires two levels of subtotal break, you will probably want the data file sorted on two keys. Sort on the minor (break 2) key first, then the major (break 1) key. The ordering produced by the first sort will remain intact during the second sort. This is known as a stable sort.