HP ALLBASE/BRW Tutorial

For MPE/iX Systems

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Printing History

New editions of this manual will incorporate all material updated since the previous edition.

The software product part numbers printed alongside the date are the versions and update levels of the software products at the time the manual edition or update was issued.

First Edition	March 1990	35360A A.01.00
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Preface

This manual documents version A.01.31 of BRW on HP 3000 computer systems running under the MPE/iX operating system (beginning with Release 4.0).

MPE/iX, Multiprogramming Executive with Integrated POSIX, is the latest in a series of forward-compatible operating systems for the HP 3000 line of computers.

In HP documentation and in talking with other HP 3000 users you will encounter references to MPE XL. All programs written for MPE XL will run without change under MPE/iX. You can continue to use MPE XL system documentation, although it may not refer to features added to the operating system to support POSIX (for example, hierarchical directories).

Finally, you may encounter references to MPE V, which is the operating system for the HP 3000s not based on the PA-RISC (precision architecture-reduced instruction set computing) architecture. MPE V software can be run on the PA-RISC (Series 900) HP 3000s in what is known as compatibility mode.

Manual Structure

The *BRW Tutorial* contains five chapters, two appendixes, a glossary, and an index. This manual contains three lessons for new users and some information for **database administrators** on how to manage this tutorial.

This manual assumes that the MPE operating system is correctly installed and operating. It also assumes that you have HP TurboIMAGE/iX correctly installed and that you have access to the sample **database**, TOYDB.

Chapter 1 provides an overview of BRW, and an overview of the TOYDB database.

Chapter 2, Lesson 1, provides information about using BRW. This information includes logging in to the operating system and running BRW. This chapter then describes how to get around BRW, the BRW function keys, and the on-line help system.

Chapters 3 through 5 are a series of lessons that explain how to create and run reports with BRW. These lessons don't cover every feature of BRW; they are designed to get you up and running as quickly as possible without concentrating on unnecessary details. Full reference information is provided in the *HP ALLBASE/BRW Reference Manual*.

Appendix A provides answers to the quiz questions that appear through the lessons.

Appendix B briefly describes the sample database, TOYDB, and gives instructions on how to manage the BRW tutorials; these instructions are provided for database administrators.

Note

The system administrator, database manager, or someone who is managing the application needs to read Appendix B and make any necessary changes to the tutorial or to the account structure so that the tutorial student can run the tutorial without stopping for interruptions. This is especially important if multiple users will run the tutorial.

The Glossary defines the meaning of some BRW, HP ALLBASE/SQL, and HP TurboIMAGE/iX terms.

Conventions Used in This Manual

The typographic conventions used in this manual are summarized below.

Typographic Conventions

Notation	Description
user input	When necessary for clarity, user input is indicated like this. For example: BAMBOO: HELLO MGR.ITF3000
`COMPUTER` font	In examples, command names, options, and parameters are shown in uppercase letters, in computer font. For example: `SUM i = 1 TO ?month OF customers.turnover (i)`
bold font	Terms that appear in the Glossary at the end of this manual are printed in **bold** font the first time they are introduced in each chapter or appendix.
Italics font	Words in italics font in examples denote a parameter that you must replace with a suitable name. For example: `DIGIT_OF (`*number*`, `*number*`)`
`shading`	Shaded text represents inverse video on the terminal screen. Also, function labels are depicted in shaded text. For example: `Choose other keys .` To choose a function label, press the corresponding function key, for example, for `other keys` you press f5.
▭	The symbol ▭ indicates a key on the terminal keyboard. For example, Spacebar indicates the spacebar.
␣	When necessary for clarity, the symbol ␣ is used to indicate a required blank or an exact number of blanks.

Additional Resources

In addition to this Tutorial, BRW comes with these other manuals:

HP ALLBASE/BRW Reference Manual 35360-90051

HP ALLBASE/BRW Software Update Notice

The *Update Notice* contains release-specific information and update pages (if any) for the current release. For example, the *Update Notice* for A.01.31 contains update pages for Chapter 18 of the *Reference Manual*.

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Overview

Welcome to the *BRW Tutorial*. This tutorial will help you become familiar with using BRW to develop reports. You can report on data in serial files, KSAM files, HP TurboIMAGE/iX databases, or HP ALLBASE/SQL databases.

Note

Although you can use HP ALLBASE/SQL databases with BRW, this tutorial does not use those facilities. This tutorial is based on the TOYDB HP TurboIMAGE/iX database.

What is BRW?

BRW is a high performance business report writing system for information management professionals. Its ease-of-use significantly reduces the time taken for report development. You can tune report generation to optimize performance and conserve system resources.

The sample layout feature of BRW allows you to verify the format and design of the report without compiling, so you can see how your report will look as you design it.

BRW also has an interface to HP DeskManager so that you can distribute your reports electronically.

The BRW System

BRW is available in two versions: the full developer system, and the run-time version. The developer system contains all the facilities necessary to develop reports, and to run them. The run-time version provides the necessary facilities for application end users to run developed reports.

BRW has a comprehensive range of features. This tutorial does not cover all these features. The following paragraphs provide an outline description of the features of BRW.

Flexible Data Access

BRW supports multiple data managers. You can access data in HP ALLBASE/SQL tables, HP TurboIMAGE/iX data sets, files, or, using the iterative reporting feature, from other reports.

The iterative reporting feature allows you to output data from a specific report to a file. You can then use that output file to generate further reports.

Advanced Calculations and Functions

BRW has a powerful calculation language that allows you to perform simple and complex arithmetic operations. Operations can be performed on numeric data, string values, and date and time figures. The calculation language allows nested operations, conditional execution, array calculations, and string manipulation. You can also define your own functions or use the predefined functions supplied with BRW.

The Report Writer

The report writer is the main part of the BRW developer system. You use the report writer to specify, compile, and execute reports. To create a report with BRW, you must perform the following steps:

1. Plan how you want the data to appear on the printed page: Do you want headings or footings? How many lines of data do you want? Do you want to perform calculations on the data? Do you want running totals?
2. Run BRW and specify the report. (When you specify a report, BRW accesses a dictionary file that describes the data and any intermediate report files.) BRW writes your report specifications to a specification file.
3. Review the report layout, and modify if necessary
4. Compile the specification file. BRW creates an execution file.
5. Execute the report. You can print the report directly on the system printer, or write the report to an MPE file for later printing. You can use such a file to view the report on the terminal screen with BRW.

Run-Time Report Execution

The BRW run-time programs are supplied as part of the MPE Fundamental Operating System. These programs allow end users to run compiled reports on production systems without having to purchase BRW separately.

HP BRW-Desk

HP BRW-Desk is an add-on product to BRW that delivers reports electronically to one or more people using HP DeskManager. A single report can be split electronically, at specified levels, and each part distributed to a list of HP DeskManager users.

How the Tutorial is Structured

The tutorial consists of four separate lessons. Please do them in order.

LESSON 1 (Chapter 2)	Gets you started with BRW—includes logging in and leaving.
LESSON 2 (Chapter 3)	Takes you step-by-step through the creation and running of a report (Report 1).
LESSON 3 (Chapter 4)	Builds on the knowledge gained in the first lesson to produce a more complex report (Report 2).
LESSON 4 (Chapter 5)	is more advanced still and builds on the second and third lessons. This lesson discusses how to get better performance out of your reports. You create a new report using keyed access (Report 3).

Each lesson begins with a description of your task, and a summary of the topics covered in that lesson.

Quizzes

Each lesson includes short quizzes. Please complete these quizzes to ensure that you have understood the preceding section. If you cannot answer a question, go back through the preceding section and try to find the answer. If you still do not know how to answer the question, turn to Appendix A. If you think you *do* know the answer, turn to Appendix A anyway to make sure you are correct.

Time Needed

Each lesson is split into exercises, and estimates of the time needed to complete each exercise are supplied at the start of each exercise.

The Tutorial and the Reference Manual

The *HP ALLBASE/BRW Reference Manual* covers all parts of a complex and powerful product. This tutorial provides an introduction and overview of the whole product. Unlike the reference manual, the tutorial does not describe every feature of BRW, however, it shows you how to create, compile, and run reports. If you want to know more about a feature of BRW, please refer to the *HP ALLBASE/BRW Reference Manual*, where the feature is fully described.

BRW Training Course

You can use this tutorial to acquaint yourself with BRW before you take the BRW Customer Training Course. After the course, you can refer back to the tutorial to refresh your memory. See your Hewlett-Packard representative for details about the various levels of BRW customer training. This tutorial is not a substitute for the BRW Customer Training Course.

Where is the Tutorial Data Located?

Ask your system manager or system administrator from which account to run the tutorial, or see Appendix A. The tutorial documentation assumes that you will run the tutorial in account ITF3000, but your system manager may alter that. The account contains the TOYDB database and example solutions, and has groups for the files you create. You can use the group BRWSPEC for holding BRW specification files, group BRWEXEC for the (compiled) execution files, and group BRWONLNE for the report print files.

In Case of Difficulty

If you have difficulties, for example if you cannot make your Page Heading lineset screen resemble the example in the tutorial, leave the screen and repeat the exercise again. If you become completely lost, you can always leave BRW, delete your specification file, and try again from the beginning of the lesson. The example solutions for each lesson are in the account in which you run the tutorial. The specification file solutions are held in group BRWSPEC, execution file solutions are held in group BRWEXEC, and print file solutions are held in group BRWONLNE. For example, the specification file solution for the second report is SOLUTN2.BRWSPEC.

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LESSON 1: Getting Started With BRW

This lesson describes BRW data, shows you how to log in to the MPE operating system, how to run BRW, how to move around the program using the function keys, and how to use the on-line help system.

Note

This and all other lessons assume that you are using an HP 3000 terminal with the MPE/iX (or MPE XL) operating system installed. If you are making a network connection to the system, make the connection before starting the exercises.

The TOYDB database is located in the ITF3000 account and a BRWSPEC group has been created in that account for you to use with this tutorial. However, consult your system manager or database manager if you are in doubt about how to log on.

The Tasks

In this lesson you learn about BRW data and data dictionaries, then you log in to the MPE operating system and start BRW.

What You Will Learn

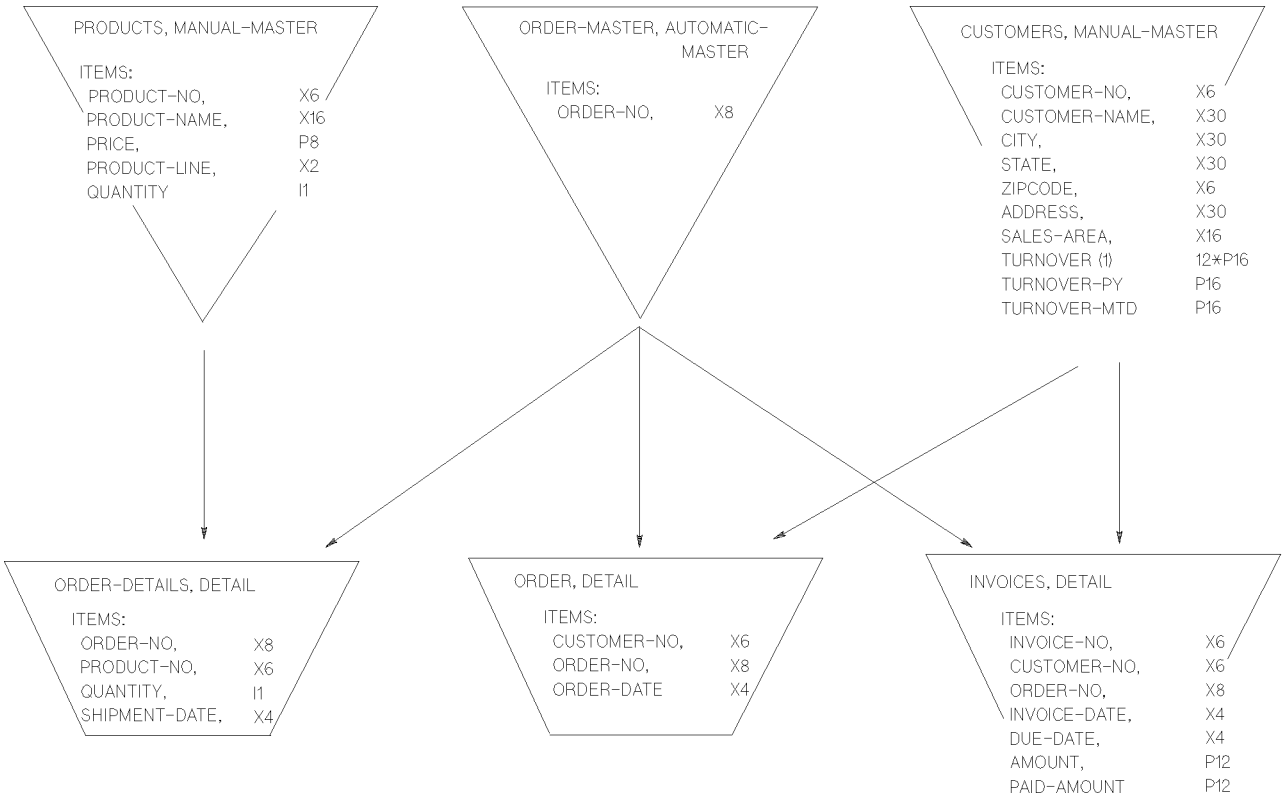
Exercise	Description
Learning about BRW Data	What kind of data can BRW use and where is the sample data for this tutorial. *This reading exercise takes about 5 minutes.*
Learning about Data Dictionaries	The use of the data dictionaries and the BRWDIC file. *This reading exercise takes about 15 minutes.*
Logging in and Running BRW	You learn about BRW by using it. *This exercise takes about 2 minutes*
Total Time:	*22 minutes*

Exercise 1: Learning about BRW Data

Before you create a report, you must find out where the data for the report is located. The examples used for the lessons in this manual are based on data in a sample TurboIMAGE database called TOYDB. TOYDB is supplied with BRW. Unless your system manager states otherwise, the database TOYDB is held in the PUB group of your ITF3000 account.

TOYDB contains three master data sets: PRODUCTS, ORDER-MASTER, and CUSTOMERS; and three detail data sets: ORDER-DETAILS, ORDERS, and INVOICES.

The following figure represents the TOYDB database:



All the data you need—CUSTOMER-NO, CUSTOMER-NAME, SALES-AREA, and TURNOVER-MTD—is held in the CUSTOMERS data set.

Exercise 2: Learning about Data Dictionaries

All data (except HP ALLBASE/SQL data) used in BRW reports must be described in a **dictionary file**, called BRWDIC, which is created from a data dictionary. Your system manager or database administrator are probably responsible for the databases and data dictionaries on your system. The BRWDIC file that comes with BRW already describes the TOYDB data. Unless your system administrator has changed it, the BRWDIC file is held in the PUB group of your ITF3000 account.

1. Before you begin this tutorial, make sure there is a file named BRWDIC in the PUB group of the account you use for this tutorial.
2. If there is no BRWDIC file in your account, or if it does not describe the TOYDB data, do ONE of the following:
   a. Copy the file BRWDIC.PUB.ITF3000 into your account.

      Or ...

   b. Create a text file containing the sample user-generated script then run the BRWGEND program as described in the *HP ALLBASE/BRW Reference Manual* Chapter 18, pages 18-51 to 18-72 (revision pages dated 5/92).

Note

These revision pages for Chapter 18 are included in the *HP ALLBASE/4GL Software Update Notice* for the A.01.31 Release of BRW.

Exercise 3: Logging In and Running BRW

Before you can use BRW you must be logged in to the MPE/iX system. The instructions given here assume that you have a valid login name, group, and account. If not, talk to your system administrator or database administrator before you continue.

Log in

1. At the operating system prompt, type:

   `HELLO` *username.accountname,groupname*

2. Press Return.

   For example, type the following command at the colon prompt:

   `: HELLO MGR.ITF3000,BRWSPEC` Return

   (Your system manager may have you login to a different group and account, but the above example shows the default for the BRW tutorial.)

3. If the system manager has assigned a password, MPE prompts you to enter it. When you see the password prompt, type your password and press Return.

   ```
   ENTER USER PASSWORD:
   ```

   MPE does *not* display the characters as you type. This is to ensure that other users cannot see your password.

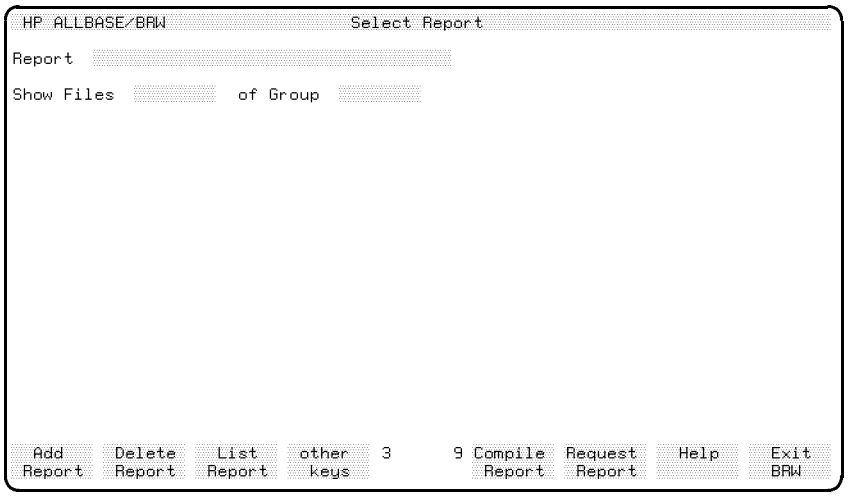
Run BRW

When you have logged in to MPE, you can run BRW.

1. At the MPE prompt, type:

   `: RUN BRWXL.PUB.SYS` Return

   After a few seconds, BRW displays the Select Report screen.



Exercise 4: Leaving BRW

As you work through the BRW tutorial, you use many different screens. You can leave BRW at any time during the session. However, if you plan to continue to the next section, do not leave BRW at this time.

Leave BRW

1. Press [Exit] from any screen in the application.
2. Press [Exit] again until you reach the Select Report screen.
3. At the Select Report screen, press [Exit BRW].

   You are prompted if you need to save any changes you have made. (If you haven't made any changes, skip the next step.)
4. Respond to the prompt (Y or N).
5. Press [Enter].

   You return to the MPE prompt.

Note

When you are in BRW, use the terminal [Enter] key, not the [Return] key. If you access BRW through a terminal emulation program from a PC, the PC [Enter] key has no effect in BRW. Use the [Enter] key on the keypad.

Lesson 1: Quiz 1

Please answer the following questions. The solutions to most of these questions are supplied in Appendix A; however, some of the answers must be supplied by your database administrator or system manager.

This quiz covers exercises 1 to 4 of Lesson 1.

1. What is the name of the sample database you will use for this tutorial?

2. Where is the sample database located?

3. What is the name of the data dictionary you will use for the sample database?

4. Is the data dictionary located in the PUB group of the account where your data resides?

5. Are there any special login or connection instructions you need to know for your MPE system?

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LESSON 2: A Simple Report

This first report introduces you to BRW and the concepts of report writing. You will define, compile, and run a report that reads a data set, formats the information contained within it, calculates totals, and prints the report.

The Tasks

In this lesson you design a monthly customer details report, broken down by sales area and customer. You have these requirements for the report:

- Access your customers' sales data and print a report showing:
  - each customer's name and number
  - the sales for each customer in the month
  - the total sales within each sales area
  - the total sales in the month for all customers in all sales areas
- Print the report on the line-printer using ordinary line-printer paper. (The report does not require special paper.)

What You Will Learn

Exercise	Description
Sketching the Report	Look at a rough sketch of the report you will create as you go through this tutorial. *5 minutes*
Using the Glossary	How to look up words in the tutorial glossary. *5 minutes*
Creating the Report	*5 minutes*
Adding a Password and a Report Description	*5 minutes*
Defining the Data Access	How BRW uses tables. How to define the final access table. How to specify the source tables. How to project items. *20 minutes*
Defining Sorts and Breaks	How to define sort items, set the level of each sort item, and set the direction of the sort. *5 minutes*

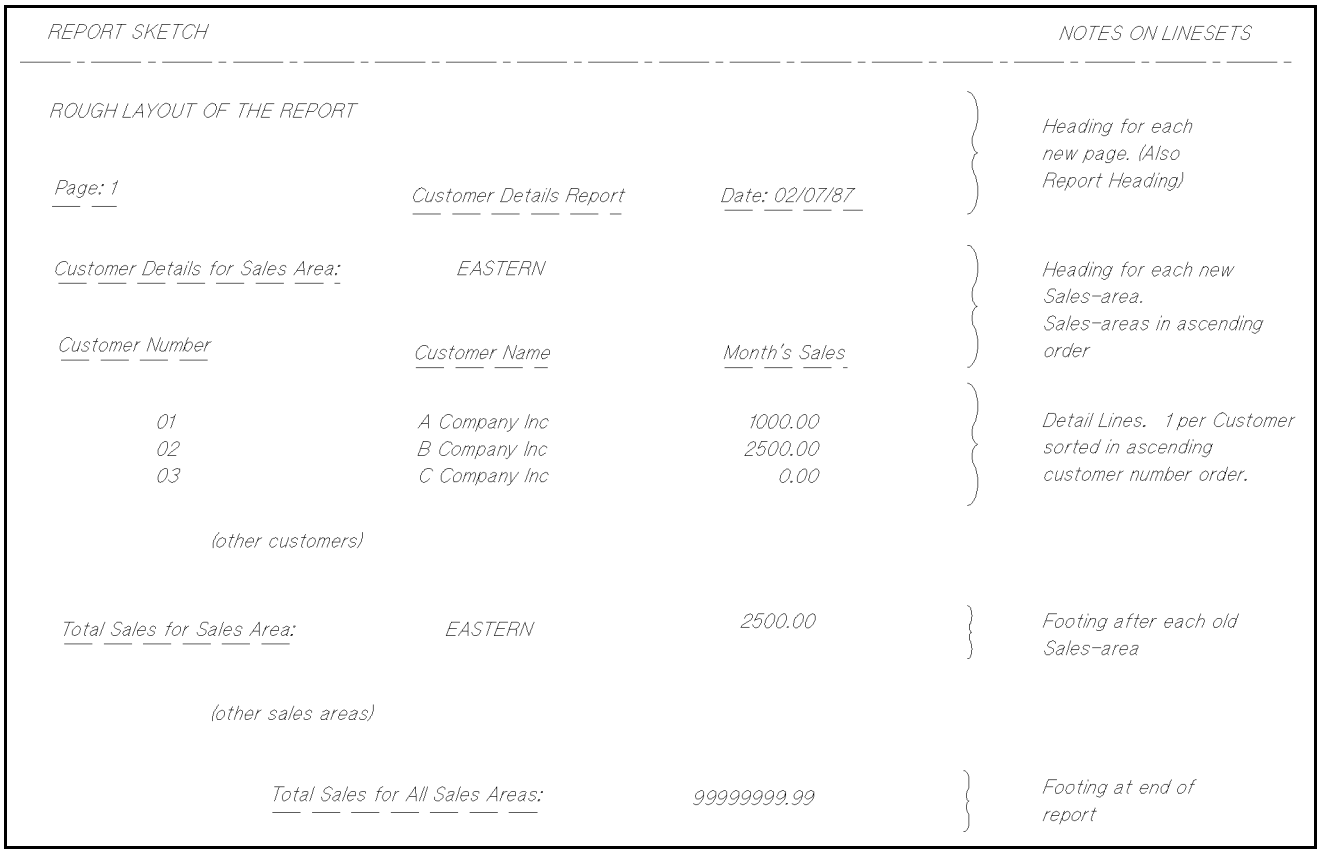
Defining Linesets	How to define linesets. The use of standard items. How to alter the length of an item. How to use Item edit masks. How to add, copy, insert, modify, and delete lines. How to do column calculations, that is, using the ColCalc field with TOTAL. *60 minutes*
Reviewing the Layout	How to make sure that your report is correct before compiling it. *5 minutes*
Compiling the Report	How to compile a report specification file to produce the report execution file. How errors are indicated by compilation messages. *10 minutes*
Requesting the Report	How to stream a job that runs the report execution file. How to set the print device, number of copies, and priority. How to make sure that the job is running. *10 minutes*
Total Time:	*2 hours 10 minutes*

Exercise 1: Sketching the 1st Report

Before you start to create a report, it is a good idea to have a rough idea of its structure. This exercise shows you a typical rough draft for a report. All you need to do is study the sketch so you understand the report you will create. *This exercise takes 5 minutes.*

For example, the report for this tutorial needs a page heading, with the report title, page number, date, and so on; a break heading to indicate the start of a new sales area; a footing at the end of each sales area to print the total sales for each area; one detail line per customer to show each customer's number, name, and sales for the month; and a report footing at the end of the report to print the total sales for all customers, in all sales areas, for the month.

The following figure shows a rough sketch of the report you will create in this tutorial.



The sketch shows that the report should be in ascending sales area order. Within each sales area, the customer details should be in ascending customer number order. Therefore, the data must be sorted in ascending order for sales area and customer number. These two items, SALES-AREA and CUSTOMER-NO are the sort items for your report. (The term sort item simply denotes that the item is used for sorting). You can have up to nine sort items, that is, nine levels of sorting in a report.

The only calculations required are total sales for each sales area and total sales in all sales areas. BRW will calculate these automatically. The report can use the standard paper, page length, and page width.

Exercise 2: Using the Tutorial Glossary

As you go through this tutorial, you will be introduced to new terms. Most of these terms are defined in the glossary section of this manual. *This exercise takes 5 minutes.*

For this exercise, read the following paragraphs. Some words are printed in bold type and have additional information you can look up in the glossary of this manual. The paragraphs and terms will help you understand the rough sketch of the report described in Exercise 3.

What is a Break?

Normally, a **break** occurs when you want BRW to calculate totals, print lines of text or totals at the **footing** for one set of **records**, and then print a heading for the next set. A report can break whenever a **sort item** changes.

For example, in this report, SALES-AREA is a **sort item**. When SALES-AREA changes from EASTERN to NORTHERN, all the records for the EASTERN sales area have been written. BRW totals the sales for sales area EASTERN and prints it. Then BRW prints the heading for the sales area NORTHERN.

You can have up to nine breaks, or **break levels**, in a report, one for each sort item. Break levels are discussed in more detail in the Define Sort Breaks exercise.

What is a Lineset?

A lineset is a group of lines (minimum 1 line, maximum 999 lines) that are treated as a whole and can be printed together. For example, the lines printed for the footing and heading of a break are known as break footing linesets and break heading linesets. The lines that are printed at the top of a new page, normally the page number, date, report title, and so on, are called the page heading lineset. BRW prints the page heading lineset (unless you use a **suppress condition**) at the top of each page of the report.

Other linesets include the **report footing** lineset and the **detail** lineset which prints the details of the report. In the tutorial report, the report footing lineset prints the total sales for all customers in all sales areas and the detail lineset prints the customer's name, number, and turnover for the month.

You can have a maximum of 9 sort items in a report and up to 23 linesets.

The **layout** for each lineset is created at a separate screen. When the report is run, BRW combines each lineset layout into a single report layout.

Applying What You Learned

The following paragraph describes the linesets for this report. Apply what you learned about the new terms you read about and looked up in the glossary to help you understand this description.

The Linesets for This Report

This report has five linesets, as described below.

1. The Page Heading lineset. This lineset prints the report title, page, and date on the top of each page. For this simple report, it also acts as the report heading.
2. The Level 1 Break Heading lineset, that is, the lineset that is printed before each new sales area when the sort item SALES-AREA changes. This lineset prints the sales area name and a line to introduce the detail lineset.
3. The Detail lineset, that is, each record in the report. For this report, the detail lineset contains each customer's name, number, and turnover in the month.
4. The Level 1 Break Footing lineset, that is, the lineset that is printed after the details for the last customer in the old sales area, when the sort item SALES-AREA changes. This prints the total monthly turnover for all the customers in the sales area.
5. The Report Footing lineset, that is, the total turnover for all customers in all sales areas, printed at the end of the report.

Note that you only need one break level, that is, for the break on SALES-AREA. Although you sort the report on CUSTOMER-NO, you do not need to define break heading and footing linesets for that item because each different customer number is printed on a separate detail line and requires no heading or footing.

LESSON 2: Quiz 1

Please answer the following questions. The solutions to these questions are supplied in Appendix A. This quiz covers exercises 1 and 2.

1. How many sorts can you have in a report?

2. How many break levels can you have in a report?

3. What total is printed on the break footing on SALES-AREA?

4. "When creating a report, it is best to go directly to BRW without roughing out a plan for the report." Is this statement true or false? Why is it true or false?

5. What data is printed on the detail lineset in this report?

Exercise 3: Creating the Report

This exercise shows you how to create the report, how to add a password and a description of the report, and how to use the BRW help screens. *This exercise takes 5 minutes.*

Where to Begin

If you are not already logged in to the operating system, do so now. Refer to Lesson 1 in Chapter 2 for details on logging in and running BRW, if you are unsure of the procedure.

The first screen that BRW displays is the Select Report screen.

Creating the Report

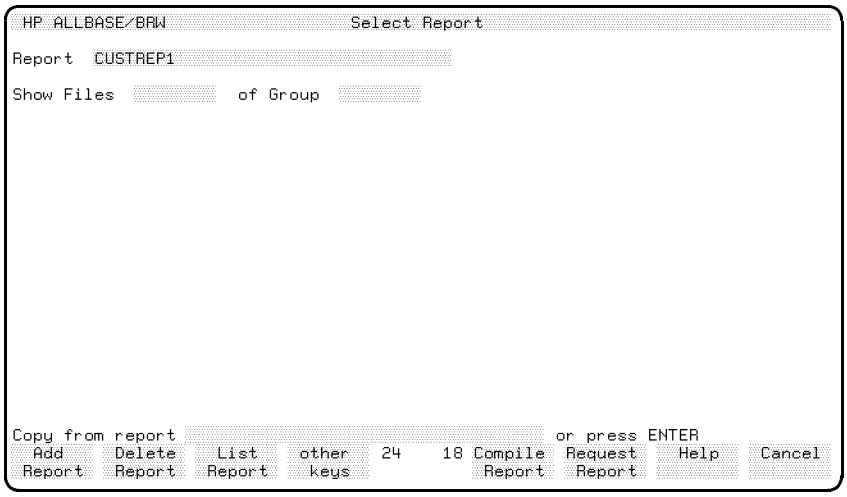
Create the Report

1. Type the report name in the Report field:

   ```
   CUSTREP1
   ```

   If multiple users are running this tutorial, you can use a unique report name, perhaps using your initials as the first three letters. (It doesn't matter whether you type the name in upper or lower case. If you use lower case, BRW converts it to upper case.)

2. Choose `Add Report`. BRW displays the prompt `Copy from report` at the bottom of the screen.



3. This tutorial is a new report, so ignore the prompt and press Enter. (Later we will learn how to copy a report.)

Note

Use the terminal Enter key. The Return key has no function in BRW.

BRW creates the report, and displays the Define Report screen.

```
HP ALLBASE/BRW                    Define Report                      Report: CUSTREP1

 Report Specification Password

 Report Description

 Report Width         132        Number of Horizontal Pages  1

 Page Length          60

 Special Paper

 String Sorting Sequence           A  ( A = ASCII, E = EBCDIC, N = National )

 SQL Transaction Isolation Level      ( RU=Read Uncommitted,RC=Read Committed,
                                        CS=Cursor Stability,RR=Repeatable Read )

 USE Access of Report

 Final Access Table
Report created                                                                  730
 Define   Define   Define   other   4     35  Define   Output    Help     Exit
 Table    Lines    Breaks    keys             Select'n  File
```

Note the message "Report created", at the bottom of the Define Report screen. Whenever you perform an action, BRW displays a message here to tell you whether the action was successful.

Help Screens

Just in case you would like some added information or if you need help understanding a screen, every BRW screen has an associated Help screen.

Use the Help screen

1. Choose Help, (which is always f7).

```
HP BRW                         Help Define Report                      Page 1 of 3
   Use this screen to specify general characteristics for your printed report.
      PROCEDURES
Modify Specifications     1) Input general specifications as desired;
                          2) Press ENTER.

     SCREEN FIELD DESCRIPTIONS
Report Spec. Password     File lockword for specification file.

Report Description        Descriptive name for report. Item REPORT-DESCRIPT will
                          print this description on your report.

Report Width              Max. # chars. across the page (max. allowed = 300).

Number of horizontal      Number of report pages to be printed side by side on
Pages                     one page.

Page Length               # lines per page (max. allowed = 999).

If you use more than 1 horizontal page, the result of the following formula
must be less than 65529:

   ( report width + 1 ) DIV 2 * page length * number horizontal pages * 2

                                          1      1            Next              Exit
                                                              Page              HELP
```

2. Choose Next Page to see the next page of information.
3. Choose Prev Page to return to the original page.

4. Choose `Exit HELP` to return to the Define Report screen.

For this screen there were two pages of information. When you look at other BRW screens, there may be only one page of help. In that case, the `Next Page` and `Prev Page` function labels do not appear.

Exercise 4: Adding a Password and a Report Description

Add a password and description

1. Type the password `PASS1` in the Report Specification Password field.
2. Press (Tab) to get to the Report Description field.
3. Type the optional description `Customer Details Report: Tutorial Lesson 2` in the Report Description field.

   This report description is a useful place to enter a short comment about the purpose of the report. If you return to the report specification later, you can see the purpose of the report at a glance, without having to look more deeply into the specification.
4. This report uses the standard paper type, length, width, number of horizontal pages, and the standard character set for string sorting. Therefore, accept the defaults that appear and do not change the fields for these settings.
5. Notice the SQL Transaction Isolation Level field. You can ignore this field for the tutorial. It is used for SQL data. Using SQL data is described fully in the *HP ALLBASE/BRW Reference Manual*.
6. Look at the USE Access of Report field. You can ignore this field for now. This field is used to copy access information from another report.
7. Look at the Final Access Table field on the Define Report screen. It is currently blank. When you are finished defining the tables for the report (in the next exercise), BRW provides the name of your final table here. Although you can define many tables (known as intermediate tables) for the report, only the final table is listed here. The final access table incorporates all the intermediate tables.
8. Press (Enter).

   BRW displays the message "Report modified" to tell you that the changes were made.

Exercise 5: Defining the Data Access

This exercise describes the BRW **final access table**, what **source tables** are, and shows you how to **project items** from the source tables into your report. *This section takes 20 minutes.*

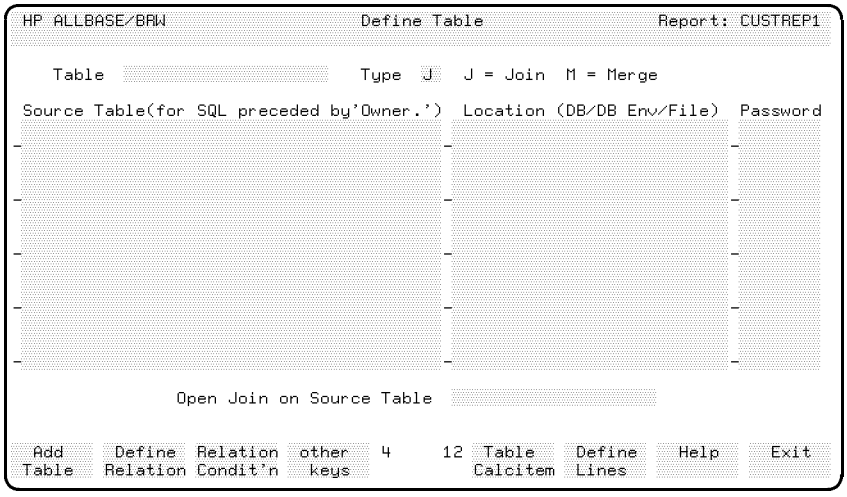
Defining a Table

For this report, you want to define your own tables.

Define a table

1. At the Define Report screen, choose `Define Table`.

   The Define Table screen appears.



   You use this screen to tell BRW where to find the data to be used in your report. The data can come from several sources, including IMAGE tables, MPE or KSAM files, or ALLBASE/SQL tables. For this tutorial, use the CUSTOMERS source table in the IMAGE database TOYDB.

2. Type a table name in the Table field.

   ```
   CUSTREP1-DATA
   ```

   This table name refers only to the table definition for this report. It does not refer to an actual file name.

3. Press Tab twice to skip the Type field. You accept the default `J` for a join type.

4. Type the source table name in the Source Table field.

   ```
   CUSTOMERS
   ```

   The source table name is the actual name for an IMAGE data set in the TOYDB database. For other reports, you can use the file format name of an MPE or KSAM file (from the data dictionary), the name of another BRW table (already defined in the same

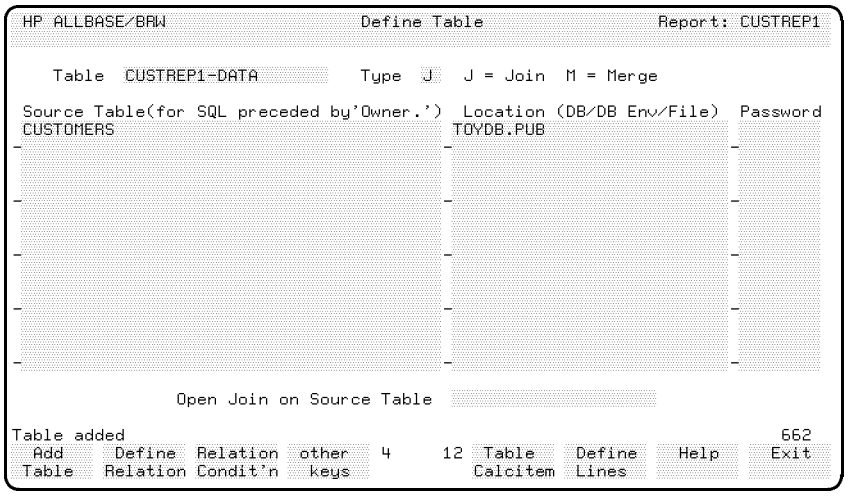
report) or the name of a data set (as we have done here). If this were an SQL table, you would use the format `owner.name` for the table.

5. Type TOYDB.PUB in the Location field.

   If you did not sign on to the ITF3000 account, or if the TOYDB database does not reside in the account where you signed on, you need to type the account name as well. For example, `TOYDB.PUB.ITF3000`. If your database administrator or system manager has moved the TOYDB database to some other group and account, type the correct location.

6. Look at the Password field. The TOYDB database does not have a password so you can skip this field.

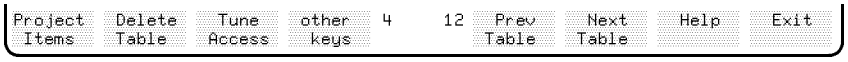
7. Press Enter or choose `Add Table`.



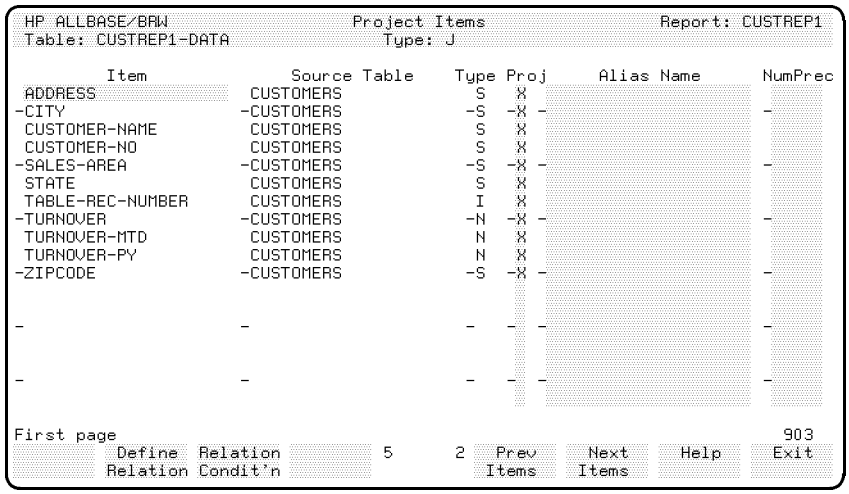
Make Sure You Can Use All the Items

Look at the available items

1. Choose `other keys`. BRW displays the following function labels:



2. Choose `Project Items` to go to the Project Items screen.



3. Look at the items listed on this screen.

   All the items in the table are listed in alphabetical order. Each row of the source table CUSTOMERS contains a **value** for every item listed here. The number of rows in the final access table depends on the number of records used from the CUSTOMERS data set when the report is run. Items that you can use in the report have an X in the Project field. If you blank out the X, you cannot use the item. All the items that you need for this report—CUSTOMER-NAME, CUSTOMER-NO, SALES-AREA, and TURNOVER-MTD—have an X in the Project field and so can be used in the report.

4. Accept the default of all Xs to project all the items.

   You could blank out unwanted items, perhaps for security reasons, but there is no need to do so here.

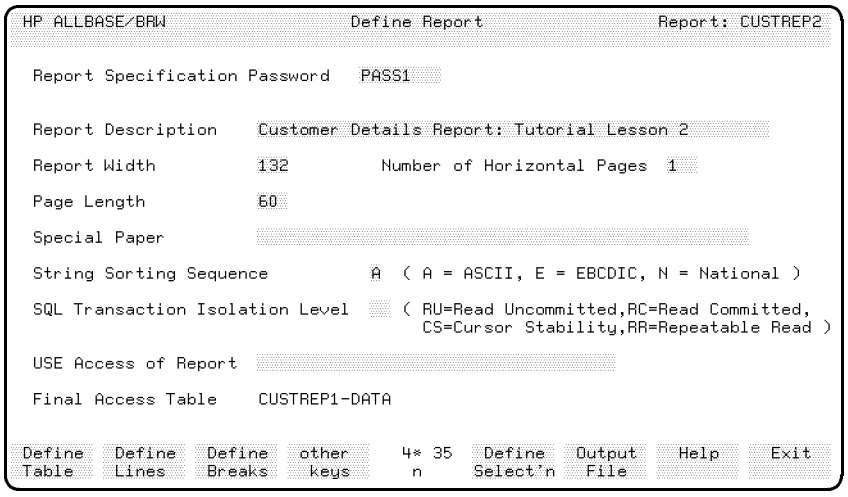
5. Look at the Alias Name field. You could give items different names in the report by typing a new name in the Alias Name field. For this report, do not use alias names.

6. Look at the NumPrec field. This field is used to set the **numeric precision** for numeric items. You do not need to set numeric precision for this report.

7. If you want more information about this screen or the fields, choose `Help` and then return to this screen by choosing `Exit Help`.

8. When you are finished looking at this screen, choose `Exit` to return to the Define Table screen.

9. Press `Exit` again to return to the Define Report screen.



Notice that there is now an entry, CUSTREP1-DATA, in the Final Access Table field. This means that the table you just defined, CUSTREP1-DATA, is the final table used for this report.

Lesson 2: Quiz 2

Please answer the following questions. The solutions to these questions are supplied in Appendix A. This quiz covers exercises 3, 4, and 5.

1. What is the final access table?

2. How many final access tables can you have in a report?

3. Can you use a data item that is not projected from a final access table in a report?

Exercise 6: Defining the Sorts and Breaks

In this exercise you will define the sort items for the report, set the level of each sort item, and the set direction of the sort. *This exercise takes 5 minutes.*

Define sorts and breaks

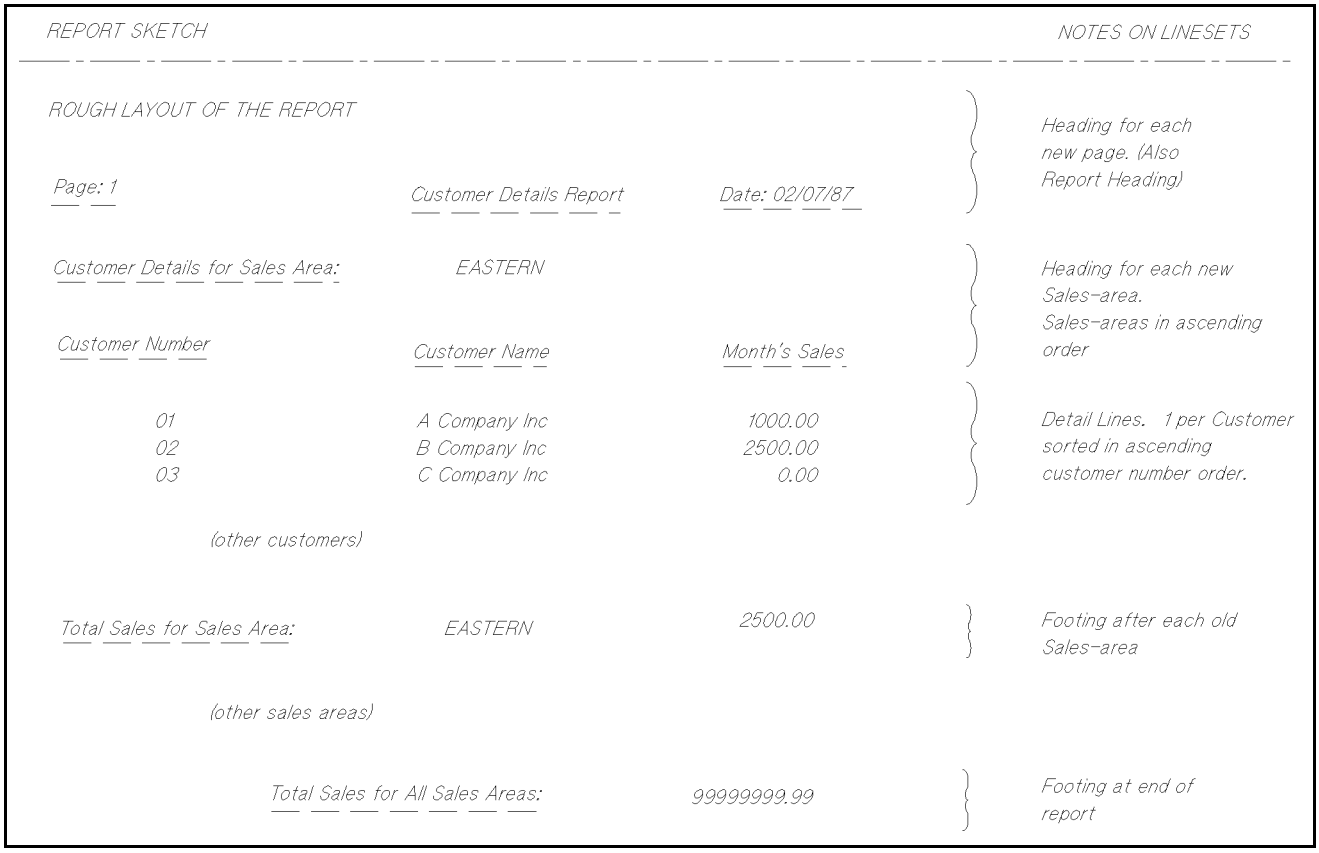
1. At the Define Report screen, choose `Define Breaks`. BRW displays the Define Breaks & Pagination screen.

```
HP ALLBASE/BRW              Define Breaks & Pagination              Report: CUSTREP1

        S o r t   &   B r e a k          |           P a g i n a t i o n
                                         |
                                         |                         Page Length  60
                              Sort   Change |     Reset Page Number on Level
                              Level  Degree |
   Sort and Break              and    for   |  --- Heading ----    --- Footing ----
      on Item         Type    Order  Break  |  Lines Paging Abs    Lines Paging Abs
( Detail Lines )               D            |  0
( Page Break   )               P            |  0                   0
( Report Break )               R            |  0                   0
_                             _      _      |       _     _               _     _
                                            |
_                             _      _      |       _     _               _     _
                                            |
_                             _      _      |       _     _               _     _
                                            |

Define   Delete   Suppress  Output  6     77                        Help    Exit
Lines    Lineset  Lineset   File
```

This is where you define the structure of the report. You must tell BRW the items on which you want the report to be sorted.

Look at the rough sketch of the report again (shown on the next page).

You know what sort items, breaks, and linesets you require. You can have up to 9 levels or sort and break items in a report. For this report, you have two levels: SALES-AREA and CUSTOMER-NO.



2. Use the Tab key to get to the Sort and Break on Item field.
3. Type `SALES-AREA` in the Sort and Break on Item field.
4. Press Tab.
5. Type `1A` in the Sort Level and Order field.

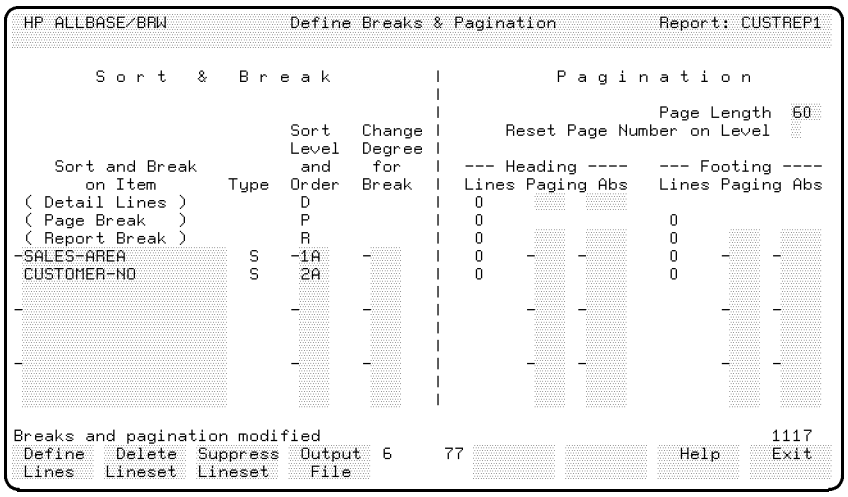
   1A means that the item is the first-level sort item, and that the sort is in ascending order (that is, A to Z or smallest number first).
6. Use Tab to get to the second line of the Sort and Break on Item field.

   Hint— Press the down cursor arrow and then Shift Tab.
7. Type the second sort item and order.

   ```
   CUSTOMER-NO          2A
   ```

   2A means that the item is the second-level sort item and that the sort is in ascending order.
8. Press Enter.

The screen should look like this:



BRW displays a message that the breaks and **pagination** have been modified. Don't be concerned about the pagination now. You return to this screen later to set the pagination.

Note

Break levels

Whenever a sort item changes and a break occurs, all *lower-level* breaks occur as well. It may help to think of the break levels as being nested:

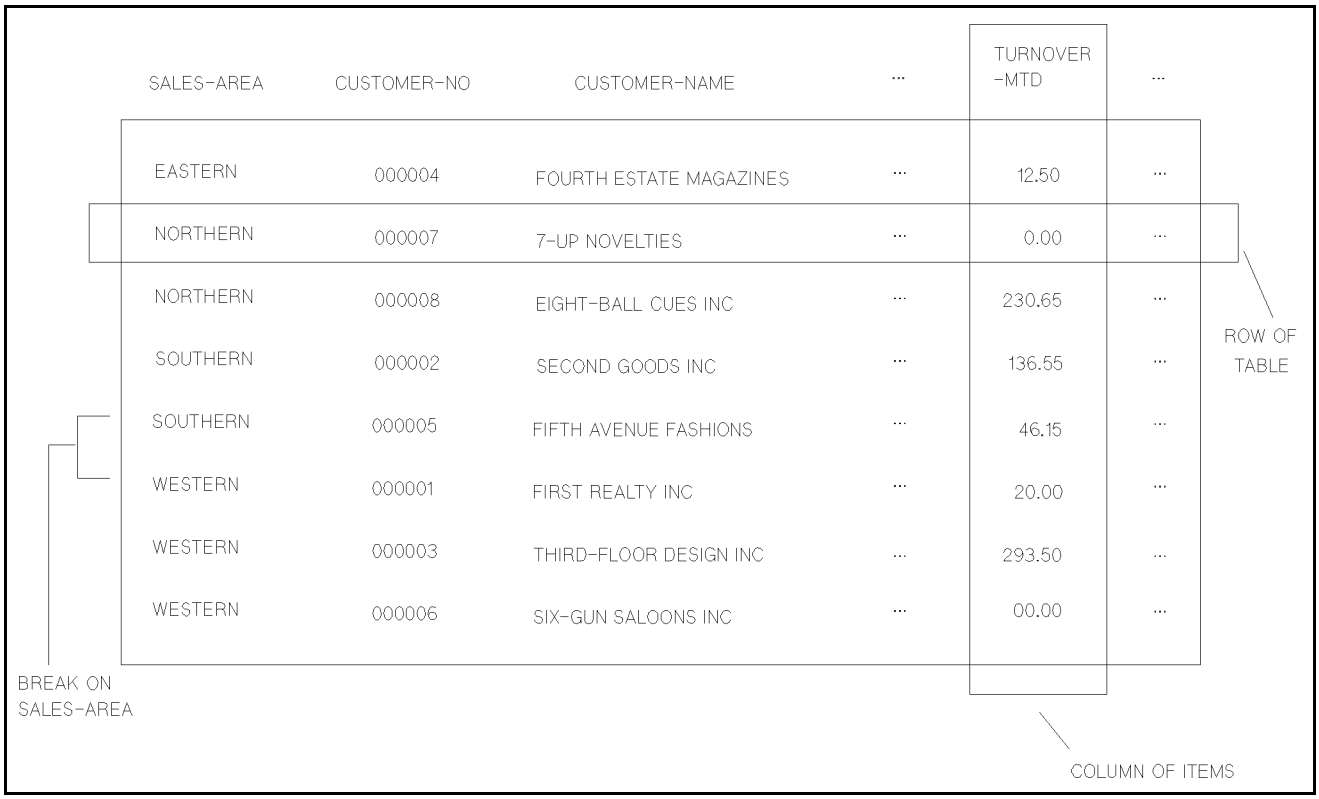
```
Level 1 Break header
   Level 2 Break Header
      Level 3 Break Header
         Detail line
      Level 3 Break Footer
   Level 2 Break Footer
Level 1 Break Footer
```

When Level 1 breaks, break headings are also printed for Levels 2 and 3.

Now you have defined the structure of the report, you can define the report linesets.

Final Access Table Illustration

The following illustration shows how the final access table is structured after you have sorted it.



Notice the callouts showing the rows of the table (these are the report detail lines), the columns of items, and the break when SALES-AREA changes. The item SALES-AREA does not change until all the records for the preceding sales area have been read, because you have sorted the table on SALES-AREA.

The records for each sales area are grouped together and sorted again according to customer number. For instance, in the Western sales area, customer number 000001 is listed before 000003 and so on.

Lesson 2: Quiz 3

Please answer the following questions. The solutions to these questions are supplied in Appendix A. This quiz covers exercise 6.

1. If you sort on three sort items, how many break levels can you have?

2. What is meant by a sort level and order of 4D?

3. If you define two sort items, what is the maximum number of linesets possible in your report?

4. With two sort items, what is the minimum number of possible linesets?

Exercise 7: Defining the Linesets

You define the linesets for the report in this section. Linesets are defined on the Define Lines screen. Each type of lineset has a slightly different Define Lines screen. *This exercise takes 60 minutes*

You have already determined what linesets you require when you sketched the report. Refer to the sketch again to remind yourself. Your report has five linesets. The linesets are described in "The Linesets for This Report".

You can define the linesets in any order. But for this tutorial, please follow the order set out.

This exercise also introduces BRW standard items and shows you how to alter the length of an item by altering the item's edit mask. It also shows you how to add, copy, insert, modify, and delete lines; and how to do **column calculations** by using the ColCalc field with TOTAL.

The Page Heading Lineset

Define the lines for the page heading

1. Press `Define Lines`. BRW prompts you for the lineset level, as shown here:

```
Specify lineset level (D,P,R,1..9):   and type (H,F):
 Define   Delete  Suppress  Output  24    37                          Help    Cancel
 Lines   Lineset  Lineset    File
```

2. Type `P` (for Page) in the (D,P,R,1..9) field, and `H` (for Heading) in the (H,F) field.
3. Press Enter. BRW displays the Define Lines screen for the Page Heading.

```
HP ALLBASE/BRW                    Define Lines                    Report: CUSTREP1
                                  Page Heading
    ....|....10...|....20...|....30...|....40...|....50...|....60...|....70...




    ....|....10...|....20...|....30...|....40...|....50...|....60...|....70...

              Item                Type  Pos   Line  Len    ColCalc    NumPrec SuppRep
  _                                     _     _     _      _          _       _
  _                                     _     _     _      _          _       _

No items defined                                                              1034
 Insert   Delete   Scroll   other   12     1    Prev     Next     Help     Exit
  Line     Lines    --->     keys               Line     Line
```

The Define Lines screen is similar for each lineset, so it is worth pausing for a moment to become familiar with it.

The banner line shows the name of your report and the type of lineset that you are defining. The top half of the screen is a window showing how the lineset will look when printed. The lower half shows all the items that are printed in the lineset. The middle of the screen—just below the ruler line—has two fields. The first, smaller field is for the line number on which you are working, and the second field is for adding literal characters to that line. This larger field is called the *line text* field.

Note

Items and Literals

Items are either final access table items or BRW standard items. The value of an item when printed depends upon its value in the current row of the final access table, which in turn depends on the value of the source table record. Literals are letters or symbols that cannot vary. For example, the words "Customer Number is:" is a literal, and CUSTOMER-NO is an item.

Add the page heading

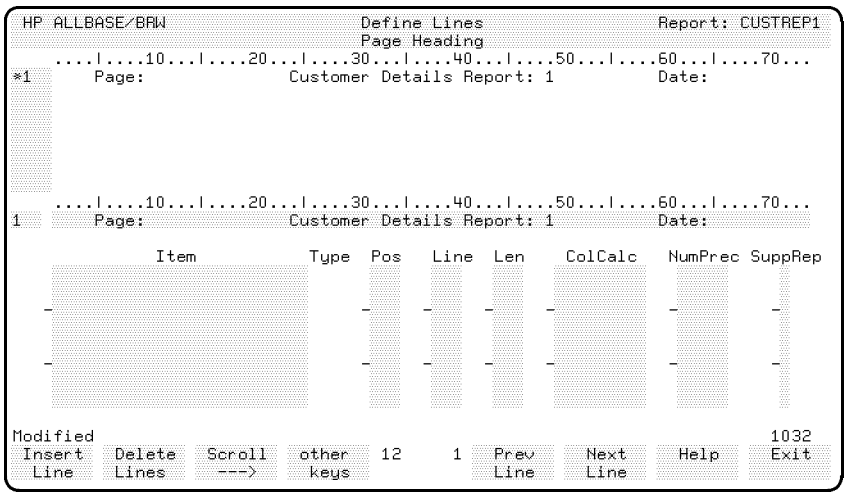
From your sketch, you can see that you want the page heading lineset to print the page number, "Customer Details Report: 1", and the date. The first line is underlined, and is followed by a blank line.

1. Start with the cursor in the first field at the left side in the middle of the screen. This field shows the line number where the characters in the text field will appear.
2. Type `1` in the first field.
3. Press Tab.
4. In the line text field, type `Page:` at character position 5.

   (Use the ruler on the screen to find the character position.)
5. Type `Customer Details Report: 1` at character position 24.
6. Type `Date:` at character position 60.
7. Press Enter to add the line.

   BRW adds the line to the display.

The Define Lines screen should look like this:



Note

Adding lines

When you use Enter, BRW places the text on the line specified. If there were text already in the line, that text would be overwritten.

You could use `Insert Line` instead. `Insert Line` places the text *on a new line* above the line specified in the line number field. The lines are renumbered to accommodate the new line.

The best way to understand how this works is to experiment with `Insert Line`. Feel free to experiment here. Just be sure when you are finished that the screen looks like the sample above.

Don't type a line number and press Enter as a way to call up another line. Doing that can inadvertently overwrite text you want to keep. Use `Prev Line` and `Next Line` instead.

Exercise 8: Using Standard Items

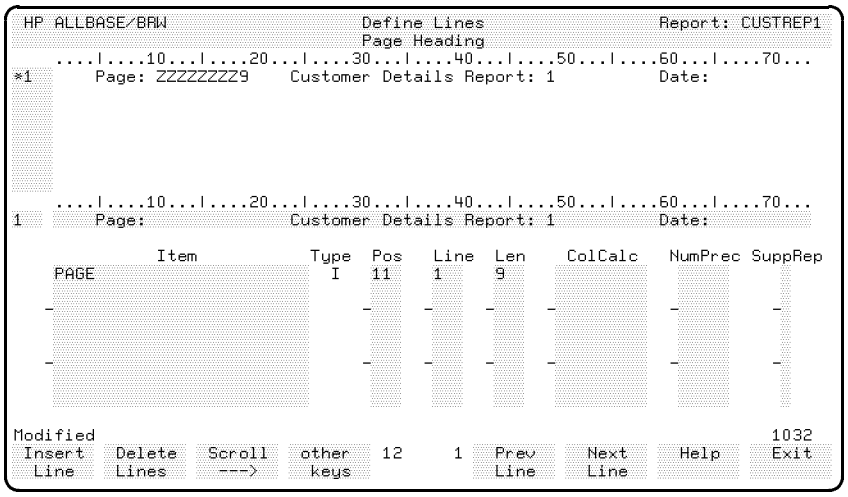
In this exercise, you specify the date and page in your page heading. You use the BRW standard items DATE and PAGE. (A list of BRW standard items is in the *HP ALLBASE/BRW Reference Manual*.)

The step-by-step instructions do not always tell you every keystroke you need to make. For instance, you know how to use Tab or the cursor keys to move between fields, so this exercise does not tell you to do that.

Put a page number on the report

1. Move the cursor to the Item field.
2. Type the standard item `PAGE` in the Item field.
3. Type `11` in the Pos field and `1` in the Line field.
4. Press Enter.

   Notice that the upper window of the screen changes to reflect the positioning of the page field. The screen now shows `ZZZZZZZZ9` following the text `Page:` on line 1.



   The character 9 means that the item is a numeric type, and the character Z means that leading zeros are suppressed. The number of characters indicates the length of the field. The standard item PAGE is nine characters long. BRW determines the item's length and type from the default edit mask (for standard items), or the data dictionary definition (for other items).

As the report will certainly not be more than 999 pages long, you can save space by reducing the length of the PAGE standard item to 3 characters.

Alter the length of an item

1. Move the cursor to the Len field for PAGE.
2. Type `3` to overwrite the 9.
3. Press (Enter).

BRW displays a message to tell you that the item has been modified, and cuts the field length on the display.

Note If, during the processing of the report, the number of pages exceeds 999, BRW will generate an **exception condition** to warn you that you need to change the specification of this standard item.

Change the item position on a line

You specify an item's position on a line by changing the number in the Pos field. This number shows the character position of the start of an item. BRW will not let you place an item where it overlaps another item or literal.

Put the current date on the report

1. Type `DATE` in the Item field below PAGE.
2. Type `>` in the Pos field and `1` in the Line field.

   When you type `>` in the Pos field, BRW automatically positions the item two spaces after the last item or literal on the line.

3. Press (Enter).

   The date item appears in the upper window as `0m/0d/yy`. This is a code or **edit mask** that tells you how the date will print on the report. Every item printed on a report has an edit mask.

```
 HP ALLBASE/BRW                    Define Lines                   Report: CUSTREP1
                                   Page Heading
     ....|....10...|....20...|....30...|....40...|....50...|....60...|....70...
*1       Page: ZZ9          Customer Details Report: 1            Date:  0m/0d/yy




     ....|....10...|....20...|....30...|....40...|....50...|....60...|....70...
1        Page:              Customer Details Report: 1            Date:

                   Item               Type  Pos    Line  Len     ColCalc    NumPrec SuppRep
     PAGE                               I    11     1     3
     DATE                               D    67     1     8
    _                                       _      _     _     _           _        _


    _                                       _      _     _     _           _        _


Modified                                                                       1032
 Insert   Delete    Scroll    other   12     1    Prev     Next     Help     Exit
  Line    Lines     --->      keys                Line     Line
```

See what the date item mask means

1. Choose `other keys`.
2. Choose `Item Edits`.

   BRW displays this prompt at the bottom of the screen:

```
Edit-mask for item
  Item    Layout   Scroll   other   24   20   Prev    Next    Help    Cancel
 Edits  Calcitem   --->     keys           Items   Items
```

3. Type `DATE` at the `Edit-mask for item` prompt to see the meaning of the mask for the DATE standard item.
4. Press Enter.

```
 HP ALLBASE/BRW                  Date Item Edits                  Report: CUSTREP1
                                  Page Heading

Item DATE                    Line 1    Position 67    Length 8


Edit Mask
0m/0d/yy

       0d   = day as     00 - 31        D12      = full weekday name
       dd   = day as      0 - 31        D - DDD  = weekday name as 1 - 3
       0m   = month as   00 - 12                   character abreviation
       mm   = month as    0 - 12
                                        M12      = full month name
       yy   = year as  e.g.   85        M - MMMM = month name as 1 - 4
       yyyy = year as  e.g. 1985                   character abreviation

       (any other character is taken as it is)


Justify (Left/Center/Right)                "No Value" Character      -
Prefill with Character                     "Error Value" Character   ?


          Select  Select  4     61   Prev    Next    Help    Exit
           Item   Lineset          Item    Item
```

   This is the Item Edits screen for the item DATE. The edit mask for DATE is 0m/0d/yy. The m stands for month, the d stands for day, and the y stands for year. The zeros mean that if the month or day is a single digit, then BRW adds a leading zero to the figure.

   This edit mask will print the date 29 April 1952 as 04/29/52. The edit mask for the DATE standard item is eight characters long (two digits for the month, a slash, two digits for the day, a slash, and two digits for the year), hence the item's length is 8.

   For other reports you could alter the edit mask if you wish, but for this report, leave it as it is.

5. Choose `Exit` to return to the Define Lines screen.

Note

Edit Mask

Each item has a separate edit mask for each time it is defined in a line. That is, if you used DATE five times on the same report or lineset, each occurrence has a separate edit mask and you could have each of the five dates print in a different form. Edit masks are further demonstrated in the fourth tutorial lesson in Chapter 5.

Underline the page heading

1. Type `2` in the first field to add text to the 2nd line.
2. Type hyphens that overwrite the literal characters in the text field. (Since you indicated that this line is now line 2, overwriting the literal characters will not modify what you entered for line 1.)

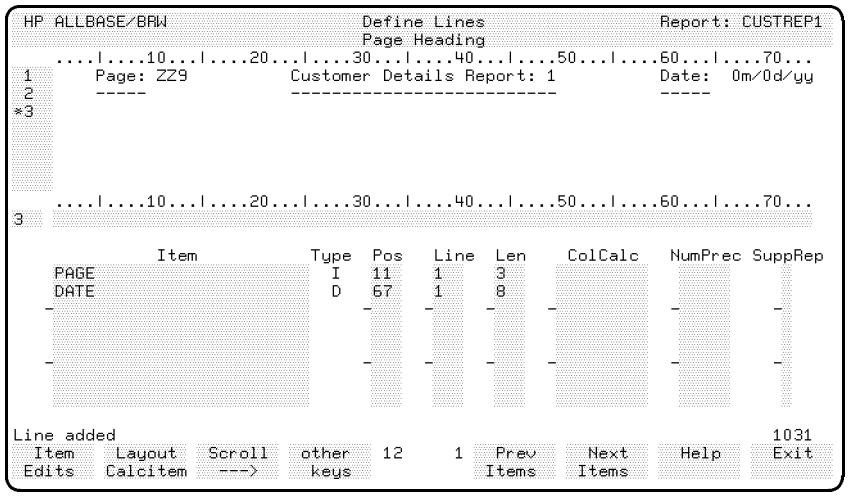
   The last hyphen corresponds to the last character you typed for line 1, that is, the colon following `Date`. Don't type hyphens in the blank spaces.
3. Press Enter. BRW adds a second line below line 1, with correctly positioned underlining.

Add a blank line to the report

1. Type the line number `3` in the first field.
2. Use the space bar to clear the second field (by spacing over the characters) or press the Clear Line key on your terminal.
3. Press Enter.

   BRW adds a blank line below line 2.

Your final page heading lineset should look like this:



Note

Clear Display

If you had used the Clear Display terminal key to clear the line text line, it would have erased the two standard items also.

You have now defined the page heading lineset. Whenever a new page is printed, the three lines you just defined are printed at the top of the page.

The Level 1 Break Heading Lineset

From your sketch, you can see that the heading for the first break (on SALES-AREA) must print the name of the sales area. It must also print a heading for the customer details. To define the first break heading, you need to change the Define Lines screen to show the heading for the first break level.

Change the lineset level

1. Choose `other keys` until the `Select Lineset` function key appears.
2. Choose `Select Lineset`. BRW prompts you for the new lineset level.
3. Type `1` (for the Level 1 Break) in the (D,P,R,1..9) field.
4. Type `H` (for Heading) in the (H,F) field.
5. Press Enter.

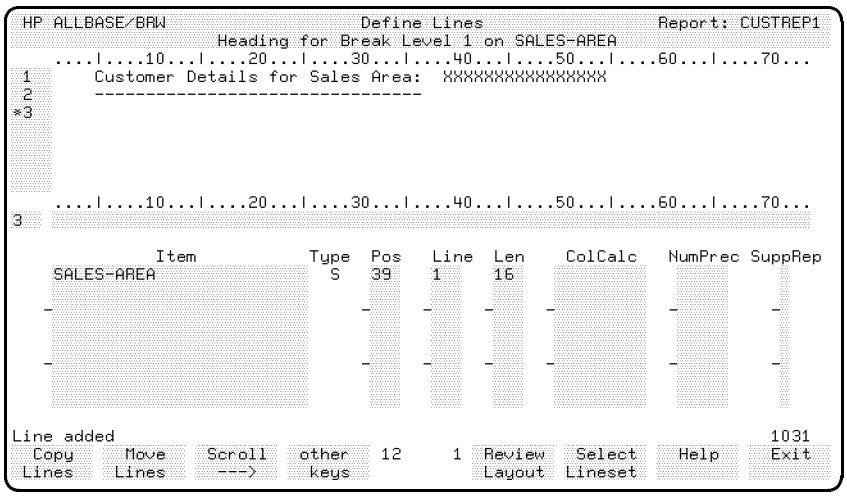
   BRW displays the Define Lines screen for the Heading for Break Level 1 on SALES-AREA.

Define the level 1 heading

1. Type `1` in the first field.
2. Type `Customer Details for Sales Area:` starting at position 5 in the line text field.
3. Type `SALES-AREA` in the Item field, `>` in the Pos field, `1` in the Line field.
4. Press Enter.

   BRW automatically aligns the line.
5. Add underlining and a blank line in the same way as you did for the page heading (earlier in this exercise).

The screen should look like this:



Add the headings for the detail lines

1. Type `4` in the line number field.
2. Type `Customer Number` at character position 5, `Customer Name` at character position 25, and `Month's Sales` at character position 60.
3. Press Enter.

   Note that if you placed this heading in the detail lineset, a heading would be printed above every detail. As you only want to print the heading once for each set of customers in a sales area, the appropriate place to print the heading is in the heading for break on SALES-AREA.
4. Underline line 4 and leave a blank line.

The final Define Lines screen for the Heading for Break Level 1 on SALES-AREA should look like this:

```
HP ALLBASE/BRW                  Define Lines                 Report: CUSTREP1
                       Heading for Break Level 1 on SALES-AREA
    ....|....10...|....20...|....30...|....40...|....50...|....60...|....70...
 1     Customer Details for Sales Area:  XXXXXXXXXXXXXXXX
 2     --------------------------------
 3
 4     Customer Number     Customer Name                      Month's Sales
 5     ---------------     -------------                      -------------
*6

    ....|....10...|....20...|....30...|....40...|....50...|....60...|....70...
6

              Item          Type  Pos   Line  Len    ColCalc   NumPrec SuppRep
    SALES-AREA               S    39    1     16
   _                             _     _     _     _           _        _

   _                             _     _     _     _           _        _

Line added                                                                1031
  Copy      Move     Scroll    other   12      1  Review   Select    Help      Exit
  Lines     Lines    --->      keys               Layout   Lineset
```

The Detail Lineset

The next lineset to be defined is the detail lineset.

Define the lines for the detail lineset

1. Choose `Select Lineset`.

   If `Select Lineset` is not showing, choose `other keys` until it is showing.

2. Type `D` (for detail) at the `Specify lineset level` prompt.
3. Press [Enter].

   BRW displays the Define Lines screen for the detail lineset.

From the original design sketch, you can see that the detail lineset is just one line, and contains the items CUSTOMER NO, CUSTOMER-NAME, and TURNOVER-MTD. These items must line up with the headings that you have already defined on the level 1 break heading lineset. You can ensure that the lines line up by copying the heading line from the level 1 lineset.

Copy lines

1. Choose `Copy Lines`.

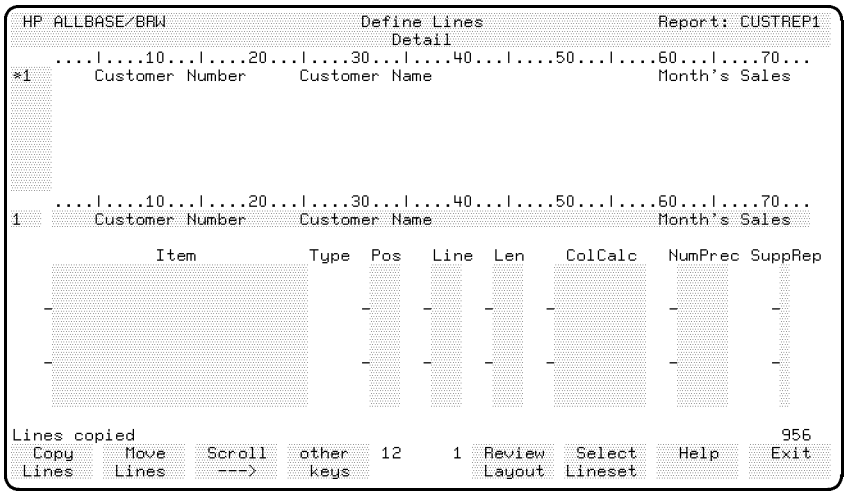
   BRW displays the following prompt:

```
Copy          from lineset level   type    to line     as A (as-is, sample)
  Copy      Move     Scroll    other   24      6  Review   Select    Help    Cancel
  Lines     Lines    --->      keys               Layout   Lineset
```

2. Type `4` in the first field. That is the line from the level 1 lineset that contains the customer header information.

3. Type `1` in the second field. That is the lineset level from which you want to copy the line.
4. Type `H` in the third field. That is the lineset type (Header) from which you want to copy the line.
5. Type `1` in the fourth field. That is the line number to which you want the line copied.
6. Press Enter.

   BRW copies the fourth line from the 1st lineset header to the first line of the current (detail) lineset.



You can now see where to start the items so that they match the heading. (Later you will delete this line.) The following instructions are purposely brief. Define the items in the same way that you defined the DATE and PAGE items.

Add the detail items

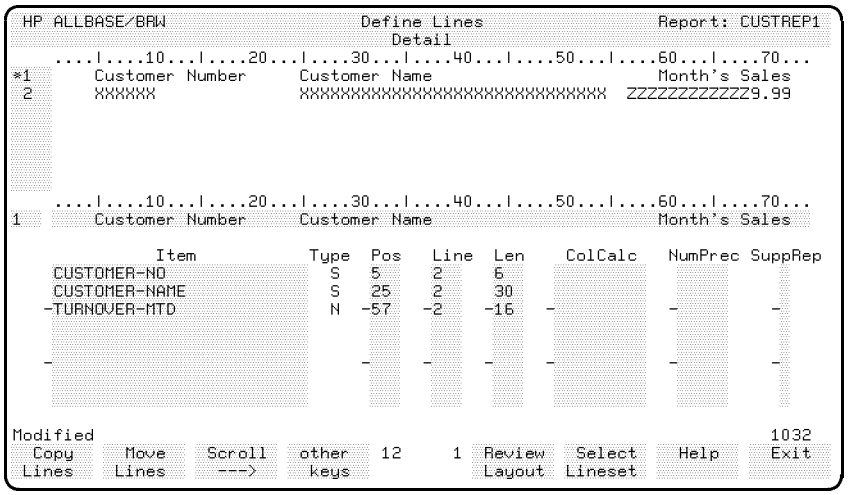
1. Type the three items CUSTOMER-NO, CUSTOMER-NAME, and TURNOVER-MTD in the Item field.

   (You can use the cursor arrow keys to move up and down between the lines of the fields.)
2. Position the items at character positions 5, 25, and 57 respectively.

   Note that by positioning TURNOVER-MTD at character position 57 you are aligning the last character of the item TURNOVER-MTD with the last character of the literal "Month's Sales". This is because TURNOVER-MTD is a numeric item and is printed from the lowest number to the highest, that is, the field is filled from right to left. If the last character doesn't line up properly, adjust the layout so that it does. (Look at previous tasks to see the alignment shown in the examples.)

3. Indicate that the items are to be placed on line 2.
4. Press Enter.

The new line appears in the upper window as shown below. Also, notice that the field length for each item appears in the Len field.



If any of the items are not correctly aligned to the heading, adjust the position by changing the Pos field.

Deleting Lines

You can see that each item is correctly aligned beneath its respective heading. However, the heading appears on this part of the layout for convenience in lining up the items. It should not remain on this section of the layout.

Delete a line

1. Choose `other keys` until `Delete Lines` appears.
2. Choose `Delete Lines`.
3. Answer `1` to the Delete Lines prompt.
4. Press Enter or choose `Delete Lines`.

Line 1 is deleted, and you are left with the one, correctly aligned, detail line in the detail lineset.

```
 HP ALLBASE/BRW                  Define Lines                 Report: CUSTREP1
                                    Detail
     ....|....10...|....20...|....30...|....40...|....50...|....60...|....70...
*1       XXXXXX              XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX  ZZZZZZZZZZZZ9.99





     ....|....10...|....20...|....30...|....40...|....50...|....60...|....70...
1

                 Item             Type  Pos    Line   Len    ColCalc    NumPrec SuppRep
     CUSTOMER-NO                   S    5      1      6
     CUSTOMER-NAME                 S    25     1      30
    -TURNOVER-MTD                  N   -57    -1     -16    -           -        -


    -                                  -      -      -      -           -        -


Lines deleted                                                                  1042
 Insert   Delete   Scroll   other   12     1   Prev     Next     Help     Exit
  Line    Lines     --->     keys              Line     Line
```

Note

If you left the heading in the detail lineset, a heading would be printed above *every* detail line. You only want the heading when the sales area changes.

The Level 1 Break Footing Lineset

The next lineset to be defined is the level 1 break footing lineset.

Go to the Define Lines screen for the break footing

1. Choose `other keys` until you see the `Select Lineset` function label.
2. Choose `Select Lineset`.
3. Specify lineset level 1 by typing `1` at the first prompt field.
4. Type `F` (Footing) at the next prompt field.
5. Press (Enter).

BRW displays the Define Lines screen for this lineset.

Look again at the report sketch. You can see that the break footing should print the total sales for the sales area. To do that, BRW can calculate the totals for each sales area.

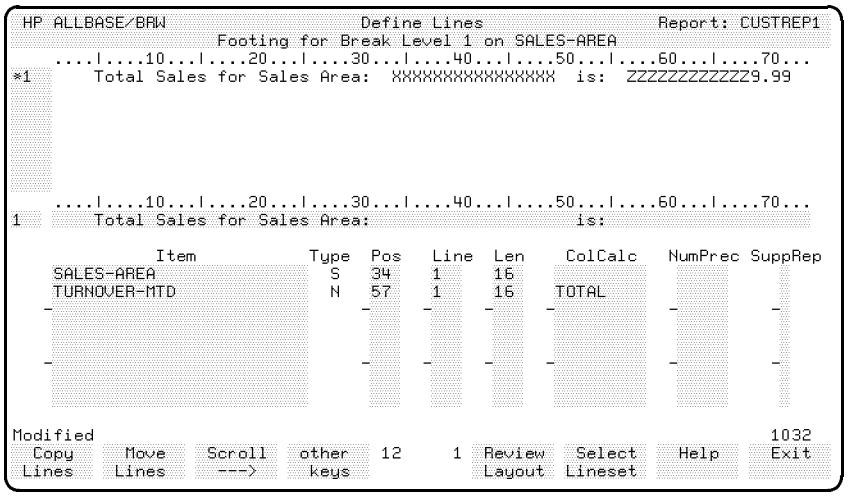
Add a column calculation

1. Type `1` in the line number field and `Total Sales for Sales Area:` in the line text field starting at character position 5.
2. Type `SALES-AREA` in the Item field, `>` in the Pos field, and `1` in the Line field.
3. Press (Enter).

   The upper window shows where BRW places the items.
4. Move to character position 52 on line 1 and type `is:`.

5. Type `TURNOVER-MTD` in the Item field, `>` in the Pos field, and `1` in the Line field.
6. Move to the ColCalc field for the TURNOVER-MTD item and type `TOTAL`.
7. Press Enter.

BRW automatically positions the items. When the report runs, BRW calculates the total for all the TURNOVER-MTD values for each sales area.



Other uses for the ColCalc field include calculating the total, average, maximum value, minimum value, or number of values (count) for any numeric, real number, or integer item.

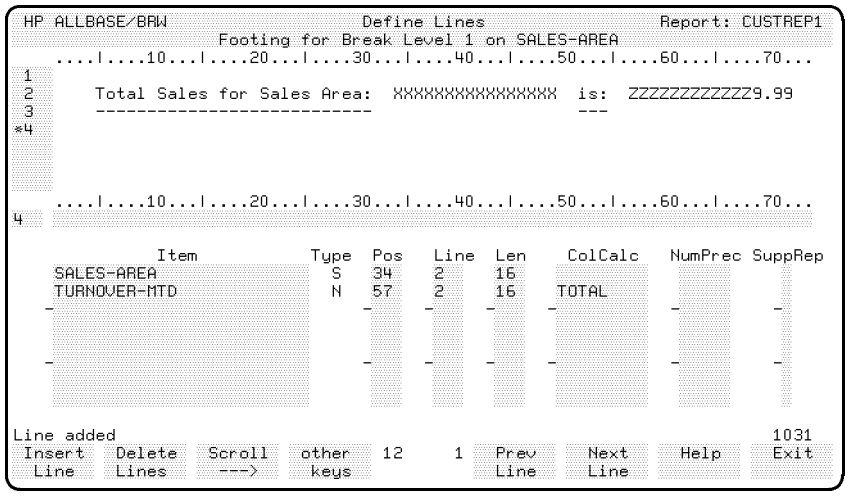
The ColCalc field is fully described in the *HP ALLBASE/BRW Reference Manual*.

Add text enhancements

Use the skills you have already learned to add these text enhancements.

1. Separate the total line from the previous detail lines by adding a blank line before line 1.
2. Underline line 1.
3. Add another blank line after line 1.

Your screen should look like this next figure.



The Report Footing Lineset

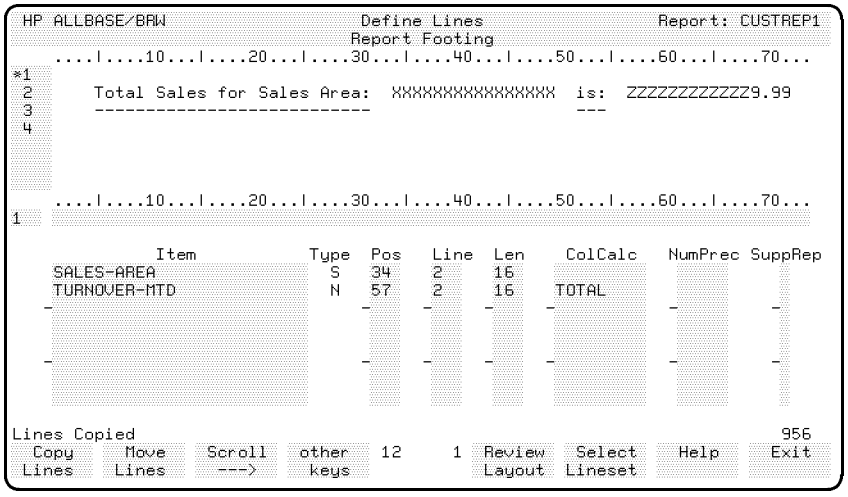
The final lineset is the report footing lineset. The sketch shows that the report footing will print the total sales for all sales areas. This line will look very similar to the level 1 break footing lineset, except that it will add all the sales for every area.

Add a report footing lineset

1. Choose `Select Lineset`.
2. At the prompt, select lineset `R` (Report) and type `F` (Footing).
3. Press Enter.
4. Copy all the lines from the level 1 break footing lineset to the report footing.
   a. Choose `Copy Lines`.
   b. At the prompt, type the number of the lines that you want to copy (that is `1/4`) in the first field.
   c. Type the lineset level, `1`, in the second field.
   d. Type the lineset type, `F`, in the third field.
   e. Type the destination line number, `1`, in the fourth field.
   f. Press Enter.

   BRW copies the lines you just created for the previous task.

The Define Lines screen for the Report Footing should look like this:



Edit the lines

1. Go to the Item field for SALES-AREA.
2. Press (Clear Line) (but do not press (Clear Display) or you will remove the item TURNOVER-MTD as well.)

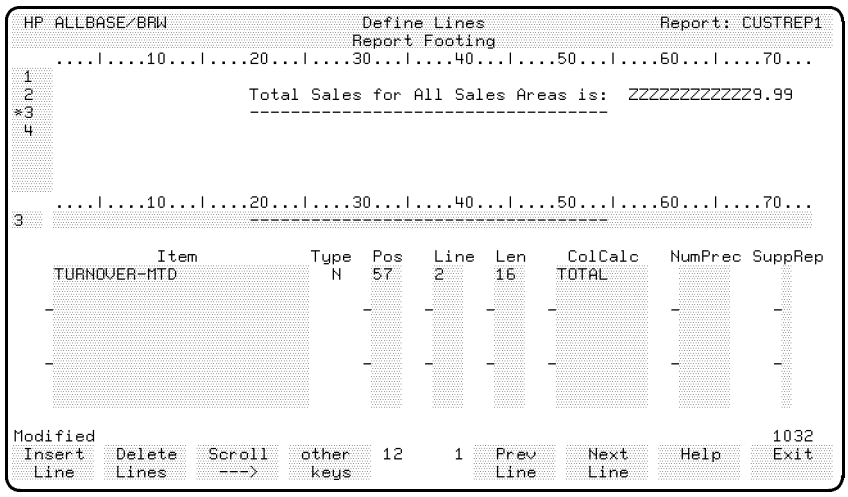
   BRW deletes item SALES-AREA.

Note

If you are not using a terminal, you may not have a (Clear Line) key. In that case, just use the space bar to clear the line. Press (Enter) after you delete.

3. Press the `Next Line` function key until line 2 is displayed on the line text field or use the "Quick Browse" feature described in the next section.
4. Change `Sales Area:` to `All Sales Areas`
5. Press (Enter).
6. Delete the spaces between `Areas` and `is:`
7. Move the entire line text string until it is next to the TURNOVER-MTD field.
8. Press (Enter).
9. Choose `Next Line` to display line 3.
10. Edit the underlines until they match the line text on the line above.
11. Press (Enter).

Your screen should look like this:



Note

Quick Browse

You can use the Quick Browse feature to move directly to a line. Just type the line number in the line number field and press either `Next Line` or `Prev Line`. BRW moves directly to the line you request. This is very helpful when you have many lines in a lineset.

The item TURNOVER-MTD in this report footing will total all the occurrences of TURNOVER-MTD in the report (it will not reset until the Report Footing break, which is, of course the end of the report). In comparison, the item TURNOVER-MTD in the level 1 Break Footing will reset after each break on SALES-AREA. (This reset-on-break-level is the default use of ColCalc TOTAL.) Refer to the *HP ALLBASE/BRW Reference Manual* for details about other reset levels.

Lesson 2: Quiz 4

Please answer the following questions. The solutions to these questions are supplied in Appendix A. This quiz covers exercises 6 to 8 of Lesson 2.

1. If you specify the standard item DATE in a lineset, what is printed when the report is run?

2. What screen is used to alter the appearance (edit mask) of an item?

3. What happens if you specify a > character in the Pos field for an item?

4. If you specify TOTAL in the ColCalc field for an item in the report footing lineset, what is printed when the report is run?

5. What other calculations are possible using the ColCalc field?

Exercise 9: Reviewing the Layout

Your report is now ready to be compiled. Before you compile it, you can review the layout to see, online, how the report will look when printed. *This section takes 5 minutes.*

Review the layout

1. Choose `other keys` until `Review Layout` is displayed.
2. Choose `Review Layout`.

   BRW displays the following screen:

```
HP ALLBASE/BRW                    Review Layout                    Report: CUSTREP1

     ....|....10...|....20...|....30...|....40...|....50...|....60...|....70.
  PH1>    Page: ZZ9          Customer Details Report: 1          Date:  0m/0d/
  PH2     -----              --------------------------          -----
  PH3
 1BH1     Customer Details for Sales Area:  XXXXXXXXXXXXXXXX
 1BH2     --------------------------------
 1BH3
 1BH4     Customer Number     Customer Name                       Month's Sales
 1BH5     ---------------     -------------                       -------------
 1BH6
   D1     XXXXXX              XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX  ZZZZZZZZZZZZ9.99
 1BF1
 1BF2     Total Sales for Sales Area:  XXXXXXXXXXXXXXXX  is:  ZZZZZZZZZZZZ9.99
 1BF3     ---------------------------                    ---
 1BF4
  RF1
  RF2                    Total Sales for All Sales Areas is:  ZZZZZZZZZZZZ9.99
  RF3                    -----------------------------------
  RF4

     ....|....10...|....20...|....30...|....40...|....50...|....60...|....70.
Last page                                                                  1222
 Define   Print    Scroll   Scroll  1      1   Prev     Next     Help     Exit
 Lines    Layout   <---     --->                Page     Page
```

   Every line of every lineset is shown on the Review Layout screen. You can go to Review Layout from any Define Lines screen to see if the lines are correctly aligned and then return to the Define Lines screen to make changes if necessary.

3. Choose `Exit` until you return to the Define Report screen.
4. Choose `other keys` until you get to the `Save Report` key.
   Choose `Save Report`.

   All the specifications you have made are recorded in the report specification file. This file holds the details of your report and is used by BRW as the source from which to compile the report.

5. You can print out a listing of the specification file by choosing `List Report` from the Select Report screen.

Exercise 10: Compiling the Report

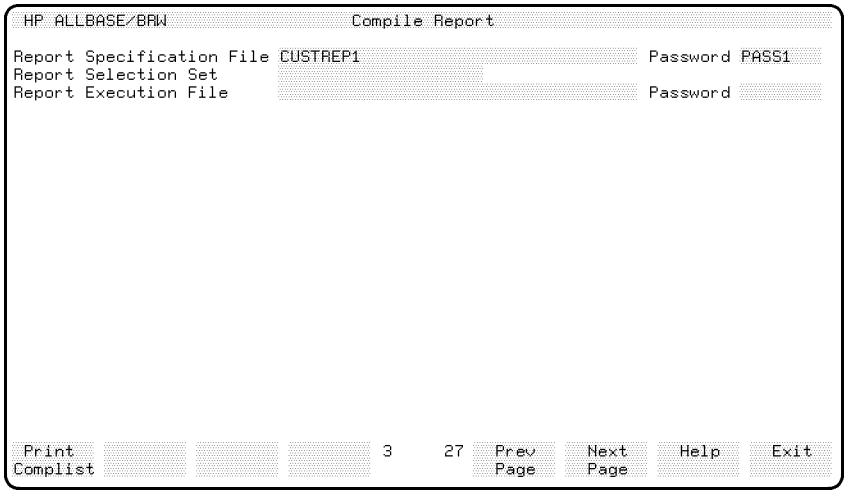
In this exercise you compile the report specification file to produce a report execution file. This section also explains how errors are indicated by compilation messages. *This exercise takes 10 minutes.*

As you compile the report, you must assign a name for the report execution file. You can save the execution file in a different group, for example, group BRWEXEC, and then the execution file can have the same name as the specification file. You can assign a password to the execution file if you wish. (If you save the execution file in the same group as the specification file then you will have to give the execution file a different name.)

Compile the report

1. Choose `Compile Report` at the Select Report screen.

   BRW displays the Compile Report screen.



2. Type the name `CUSTREP1.BRWEXEC` in the Report Execution File field.

   (If you are in an account with no BRWEXEC group, use the name of an existing group in your account or give the execution file a unique name within the current group—for instance, CUSTR1X.

3. Press Enter.

   BRW compiles the report. When the compilation is finished, the screen display should be similar to this next figure.

```
 HP ALLBASE/BRW                        Compile Report

Report Specification File CUSTREP1                                   Password PASS1
Report Selection Set
Report Execution File     CUSTREP1.BRWEXEC                           Password


HP BRW/V   (A.01.31)  HP35360 (c) Copyright Hewlett-Packard GmbH 1986-92



Configuration File opened is BRWCONF.PUB.SYS

Specification File: CUSTREP1/.BRWSPEC.ITF3000
Selection Set      :
Execution File     : CUSTREP1/.BRWEXEC.ITF3000


D A T A   A C C E S S   S T R U C T U R E
=========================================
CUSTREP1-DATA (WORK001)
   CUSTOMERS,TOYDB.PUB.ITF3000  serial

Report compiled                                                              2109
 Print                                3* 27   Prev     Next     Help     Exit
Complist                               n      Page     Page
```

The message "Report compiled" tells you that the compile was successful. If the compilation failed, print out the compilation listing as explained in the next note. The compilation listing will contain error messages about the processing.

4. When the report is compiled, choose `Exit` to return to the Select Report screen.

Note

Compilation Messages

You can read the compilation listing from the screen or print it out by pressing the `Print Complist` function key. The compilation listing tells you how the data was accessed under the heading DATA ACCESS STRUCTURE. The *HP ALLBASE/BRW Reference Manual* discusses how to use the compilation listing to improve the performance of reports.

If the compilation failed, the compilation listing will also include error messages.

Exercise 11: Requesting the Report

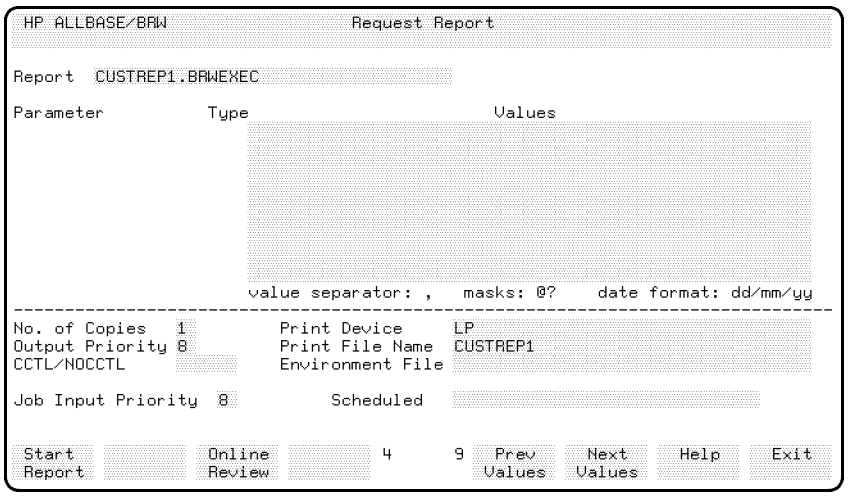
In this exercise you learn how to stream a job that runs the report execution file; how to set the print device, number of copies, and priority; and how to make sure that the job is running. *This exercise takes 10 minutes.*

When you request the report, BRW streams a job that runs the execution file to produce the report.

Request a report

1. Type the name of the execution file, (for instance, `CUSTREP1.BRWEXEC` or `CUSTR1X`), in the Report field on the Select Report screen.
2. Choose `Request Report`.

   The Request Report screen appears.



   The Report execution file name appears in the Report field.

   From this screen you can stream a job that will run the execution file to print the report; set a time for the job to run; set the number of copies of the report; set the output priority of the printed report; and specify the parameters, the print device, and the print file name.

Note

Print Devices

You can print a report to a printer or to a file on disk. If you print it to a printer, the print file can have the same name as the execution file.

3. Ignore the Parameter, Type and Values fields for now.
4. Accept the defaults for No. of Copies (1) and Output Priority (8).

5. Accept the default LP for Print Device. (If you want to print to a disk or see the report on screen, go on to Exercise 12.)
6. Type the print file name CUSTREP1 in the Print file Name field.

   For a DISC file, type a new name (not the name of an existing file) in the Print File Name field and press Enter, or use the same name but save the printfile in a different group, for example group BRWONLNE.
7. Choose `Start Report`.

   BRW prompts for the User, Group, and Account for the job, as shown in the next figure.

```
User MGR        Account ITF3000    Group BRWSPEC
 Start           Online          24     6   Prev    Next    Help   Cancel
 Report          Review                     Values  Values
```

   The fields show the default User, Group, and Account (the logon user, group and account).
8. For this report you want to to keep the default, so press the `Start Report` function key again.

   BRW now prompts for the User, Account, and Group passwords for the job. There were no passwords set up for the tutorial account when it was shipped from Hewlett-Packard.
9. If you have set passwords, first type them in the appropriate fields and then press the `Start Report` function key. If you have not set passwords, just press the `Start Report` function key again.

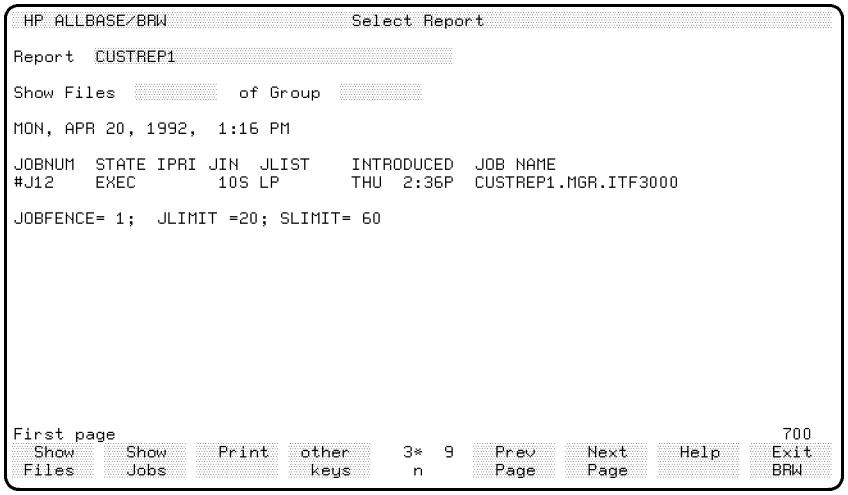
```
User Password          Account Password          Group Password
 Start           Online          24    15  Prev    Next    Help   Cancel
 Report          Review                    Values  Values
```

   BRW displays the message `Job streamed, Job number is #J`*nnn*.

See how the job is progressing

1. Choose `Exit` to return to the Select Report screen.
2. Choose `other keys`.
3. Choose `Show Jobs`.

BRW displays a screen similar to this:



Your job is displayed. If the job does not appear, it may already have finished. In that case, go to the printer to collect the report or look at the $STDLIST file.

The report should look like the sample report shown after Exercise 12.

Exercise 12: Reviewing the Report Online

If you want to view the report online, you can print the report to a disc file and then view it on your screen.

1. On the Request Report screen, change the Print Device field to `DISC`.
2. Press Enter.
3. Change the Print File Name field to the name of a disc file. For instance, `CUSTR1D`.
4. Start the report. See steps 7 through 9 in Exercise 11.
5. When the report job is completed, you can review the job status using the steps in Exercise 11.

Look at the report

1. Type the name of the print file (for instance CUSTR1D) in the Report field.
2. Choose `Online Review`.

Your report should look like the report shown on the next page.

```
Page:   1          Customer Details Report: 1          Date:  04/20/92
-----              -------------------------          -----

Customer Details for Sales Area:  EASTERN
---------------------------------

Customer Number     Customer Name                      Month's Sales
---------------     -------------                      -------------

000004              FOURTH ESTATE MAGAZINES                    12.50

Total Sales for Sales Area:  EASTERN          is:              12.50
---------------------------                   ---

Customer Details for Sales Area:  NORTHERN
---------------------------------

Customer Number     Customer Name                      Month's Sales
---------------     -------------                      -------------

000007              7-UP NOVELTIES                              0.00
000008              EIGHT-BALL CUES INC                      1038.90

Total Sales for Sales Area:  NORTHERN         is:            1038.90
---------------------------                   ---

Customer Details for Sales Area:  SOUTHERN
---------------------------------

Customer Number     Customer Name                      Month's Sales
---------------     -------------                      -------------

000002              SECOND GOODS INC.                         136.55
000005              FIFTH AVENUE FASHIONS                      46.15

Total Sales for Sales Area:  SOUTHERN         is:             182.70
---------------------------                   ---

Customer Details for Sales Area:  WESTERN
---------------------------------

Customer Number     Customer Name                      Month's Sales
---------------     -------------                      -------------

000001              FIRST REALTY INC.                          20.00
000003              THIRD-FLOOR DESIGN INC                    293.50
000006              SIX-GUN SALOONS INC                         0.00

Total Sales for Sales Area:  WESTERN          is:             313.50
---------------------------                   ---

               Total Sales for All Sales Areas is:           1547.60
               ----------------------------------
```

Execution Statistics

BRW provides statistics on the amount of CPU and elapsed time the report took to execute. You can use these statistics to improve the performance of a report. The use of execution statistics to improve report performance is fully described in the *HP ALLBASE/BRW Reference Manual*, and also in the third lesson of this tutorial. The execution statistics are printed in the $STDLIST file.

Lesson 2: Quiz 5

Please answer the following questions. The solutions to these questions are supplied in Appendix A.

1. What files must you specify when you compile a report?

2. How would you obtain a printed copy of a compilation error?

3. How could you set the output priority of the printed report?

4. If you specify `DISC` in the Print Device field of the Request Report screen, what happens to the report?

5. In the case of the above question, must you give the report a new Print File Name, and, if so, why?

4

LESSON 3: Refining Your Report

This lesson reviews the topics learned in the first lessons and introduces some new operations.

Before You Begin

Be sure that your first report was completed satisfactorily.

The Tasks

This lesson builds on the first report to produce an end-of-month report that includes a breakdown of the sales for each customer for the month of June. For each order, your report will now add the order number, product number, price, quantity on order, and total for the order.

Each new sales area will start on a new page. The first page for each sales area will be numbered page 1. The totals for all customers in all areas will print on a new page.

You will also learn how to provide some emphasis in the report whenever a customer has no orders (so you can concentrate on those customers in the future).

What You Will Learn

Exercise	Description
Starting the Second Report	How to copy other reports. *5 minutes*
Defining the Data Access	How to join tables. Using open joins. Understanding the NO_VALUE item. Using relations, relation conditions, and common items. Using standard functions. *50 minutes*
Defining Sorts and Breaks	How to suppress linesets. How to force new pages (pagination). *25 minutes*
Defining Linesets	Use of more than one break level. How to define and use layout calculated items. How to suppress lines. The logic behind the ColCalc field, and how to use source and

	reset levels with column calculations. *70 minutes*
Reviewing the Layout	*5 minutes*
Compiling the Report	*5 minutes*
Request the Report	*5 minutes*
Total Time:	*2.75 hours*

The Data You Need

In Lesson 2, the first report, you used the CUSTOMERS data set from the TOYDB database. For this second report, you will use the following data sets:

CUSTOMERS	To find the customer name, sales area, and turnover for the last month.
ORDERS	To find the orders, if any, for a customer.
ORDER-DETAILS	To find the product number and the quantity ordered for each order.
PRODUCTS	To find the price of a product.

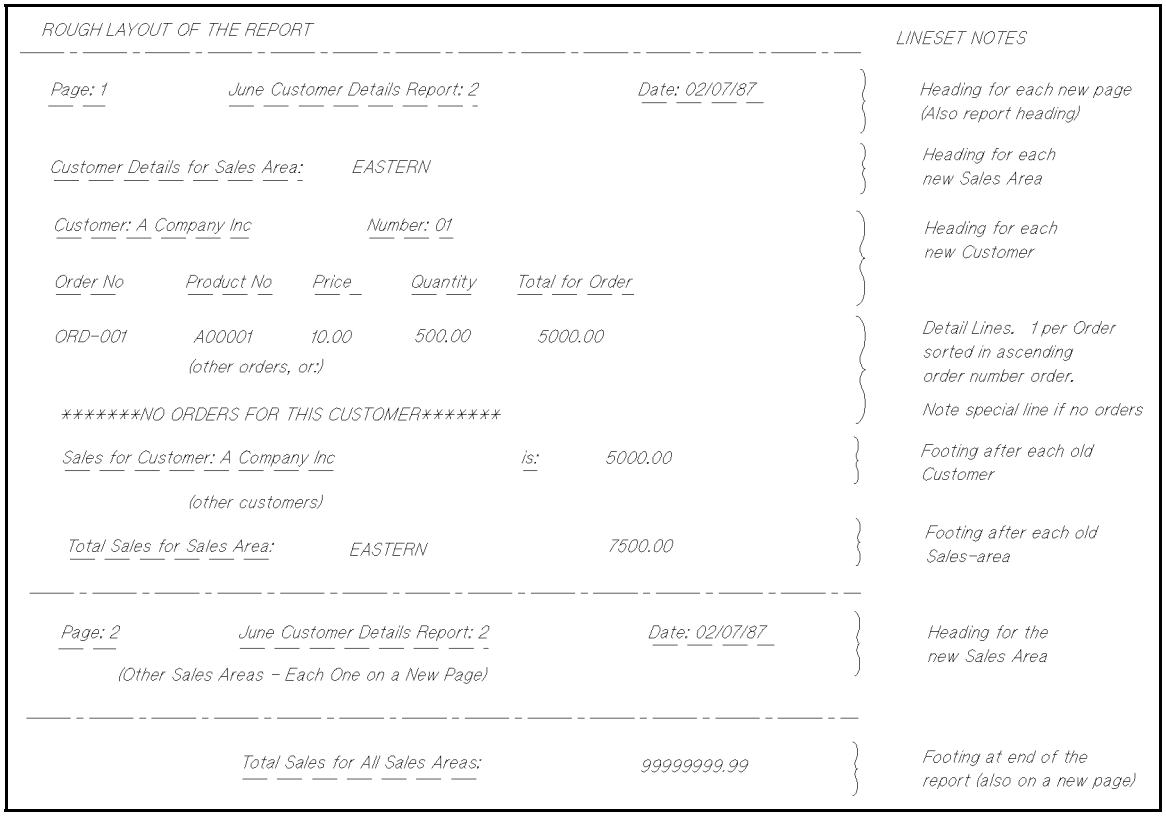
The calculations required are:

- total sales in each sales area
- total sales in all sales areas
- total value of each order

You have already defined the first two calculations in the previous report. You can easily calculate the total value of each order, by having BRW multiply the price of the order by the quantity ordered for each order.

The Report Sketch

As in the first report, a rough sketch of the report will help you understand what you are creating.



The report has seven linesets, as described below.

1. Page Heading. This lineset prints the report title, page, and date on the top of each page. For this report, it also acts as the report heading.
2. Level 1 Break Heading. This is the lineset that prints a new sales area name when the item SALES-AREA changes.
3. Level 2 Break Heading. This is the lineset that prints a new customer name when the CUSTOMER-NO changes.
4. Detail lineset. This is the detail for each record in the report, including, for this report, each order number, product number, price of the product, quantity ordered, and the total value of the order.
5. Level 2 Footing. The total sales for the customer during the month. This is printed after the details of the last order for a customer, just before the CUSTOMER-NO changes.
6. Level 1 Footing. The total monthly turnover for all the customers in the sales area. This is printed after the details for the last customer in a sales area, just before the SALES-AREA changes.
7. Report Footing. The total turnover for all the customers in all sales areas. This is printed at the end of the report.

Exercise 1: Creating the Second Report

In this lesson, you learn to create a new report by copying an existing one. If you ended your BRW session after the last lesson, restart BRW. See Lesson 1 if you need help in restarting BRW.

1. At the Select Report screen, name the new report `CUSTREP2`.
2. Choose `Add Report`.

```
Copy from report                                    or press ENTER
  Add     Delete    List    other   24    18 Compile  Request    Help    Cancel
 Report   Report   Report   keys              Report   Report
```

3. At the prompt `Copy from report`, type `CUSTREP1`.
4. Press Enter.

```
Password:
  Add     Delete    List    other   24    11 Compile  Request    Help    Cancel
 Report   Report   Report   keys              Report   Report
```

5. At the password prompt, type the password `PASS1`
6. Press Enter.

BRW copies the first report you created (in lesson 2) and displays the Define Report screen.

```
 HP ALLBASE/BRW                 Define Report                 Report: CUSTREP2

  Report Specification Password   PASS2

  Report Description    Customer Details Report: Tutorial Lesson 2

  Report Width          132         Number of Horizontal Pages  1

  Page Length           60

  Special Paper

  String Sorting Sequence          A  ( A = ASCII, E = EBCDIC, N = National )

  SQL Transaction Isolation Level     ( RU=Read Uncommitted,RC=Read Committed,
                                        CS=Cursor Stability,RR=Repeatable Read )

  USE Access of Report

  Final Access Table    CUSTREP1-DATA

 Define   Define   Define   other    4* 35  Define   Output    Help     Exit
 Table    Lines    Breaks   keys      n    Select'n  File
```

The message `Report copied` tells you that the report has been copied successfully.

Define report 2

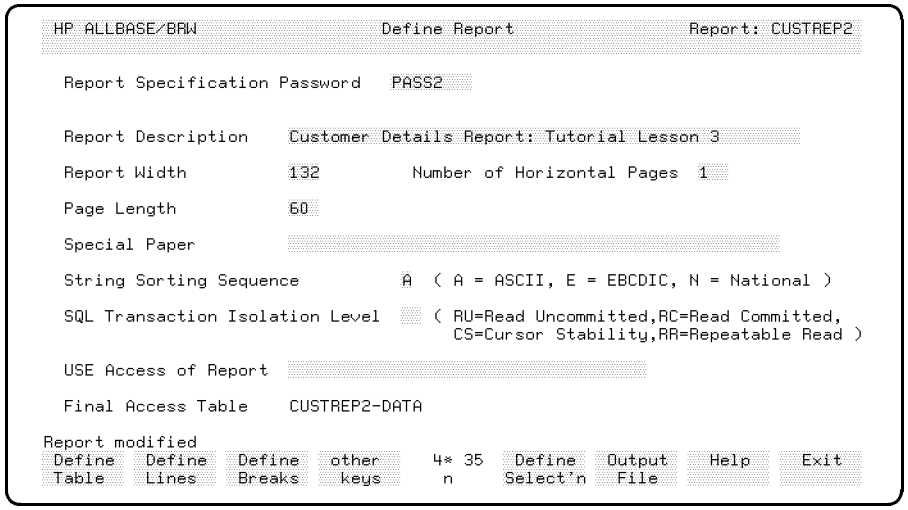
If you need more help to do this task, review the steps for defining a report as outlined in Lesson 2.

1. At the Define Report screen, type a password, `PASS2` in the Report Specification Password field.
2. Type a description in the Report Description field. For example:

   ```
   Customer Details Report:  Tutorial Lesson 3
   ```

   Since you aren't changing any of the other basic specifications (such as report width and so on), you don't need to change any of the other fields.
3. Press Enter.

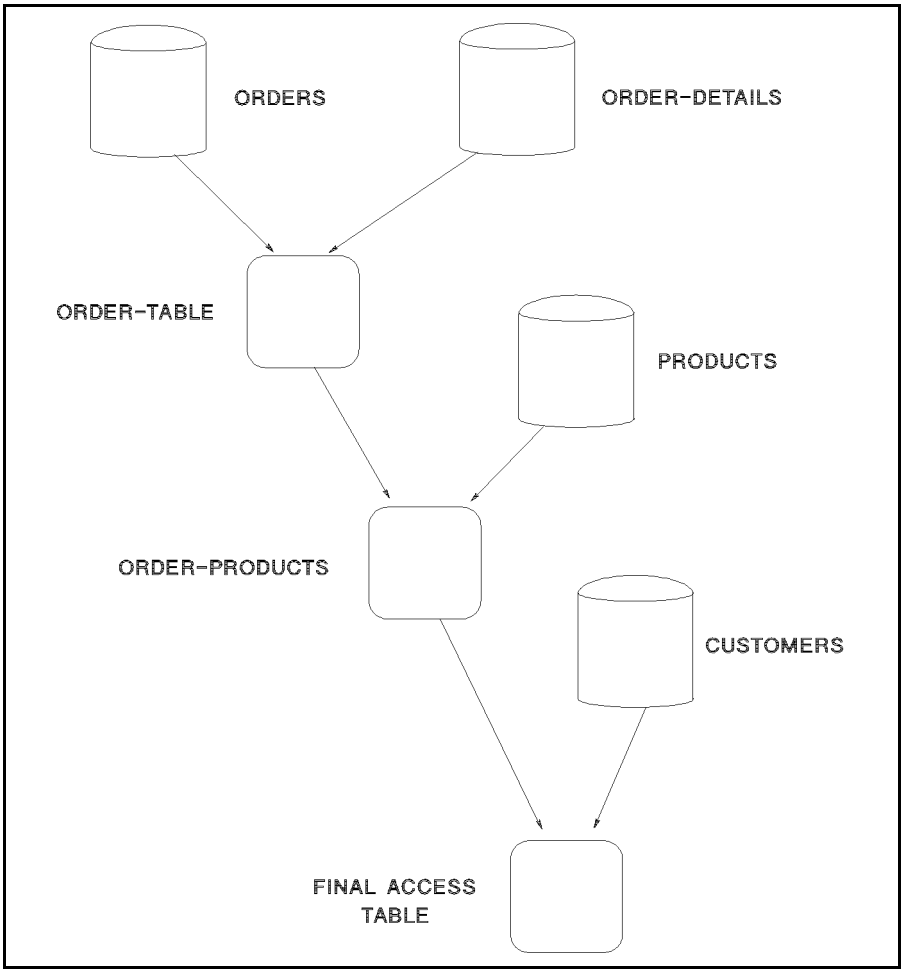
BRW displays the message `Report modified` to tell you that the changes were made.



Exercise 2: Defining the Data Access

In the first report, you used only one table. In this report you will use a *series* of tables that build to one **final access table**. *This exercise takes about 50 minutes.*

The following illustration shows how the tables are combined.

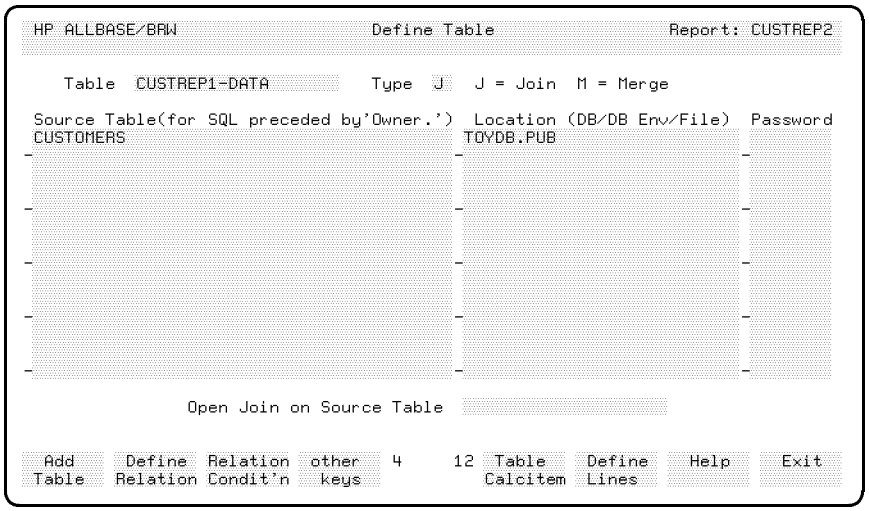


For more information about how BRW builds tables, read the *BRW Reference Manual*.

Clear the old table

1. At the Define Report screen, choose `Define Table`.

   The Define Table screen appears.



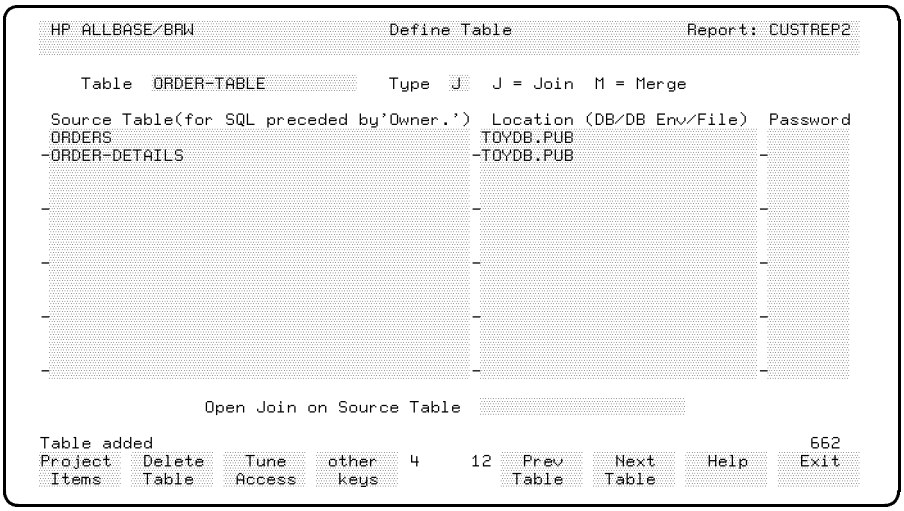
Because this report was copied from a previous report, the table name `CUSTREP1-DATA` appears in the Table field.

2. Choose `other keys` until the function label for `Delete Table` appears.
3. Choose `Delete Table`.
4. At the prompt, `Confirm deletion of table CUSTREP1-DATA`, press Enter or choose `Delete Table` again.

   The Define Table screen is cleared.

Create the ORDER-TABLE

1. Type `ORDER-TABLE` in the Table field.
2. Accept the default of `J` for the Type field.
3. Type `ORDERS` in the first line of the Source Table field.
4. Type `TOYDB.PUB` (or `TOYDB.PUB.ITF3000`) in the first line of the Location field.
5. Type `ORDER-DETAILS` in the second line of the Source Table field.
6. Type `TOYDB.PUB` (or `TOYDB.PUB.ITF3000`) in the second line of the Location field.
7. Press Enter or choose `Add Table`.



The prompt tells you that the table was added.

Defining the relation

The next task, defining a relation, is a new procedure, one that is not necessary when only one table is used, as in your first report. The relation definition specifies a **common item** that must exist between the joined tables. For example, each of the two tables joined in this exercise has an item called `ORDER-NO` that contains the order number for the sale. When the order numbers match, BRW knows that a record from each data set can be combined into a single record.

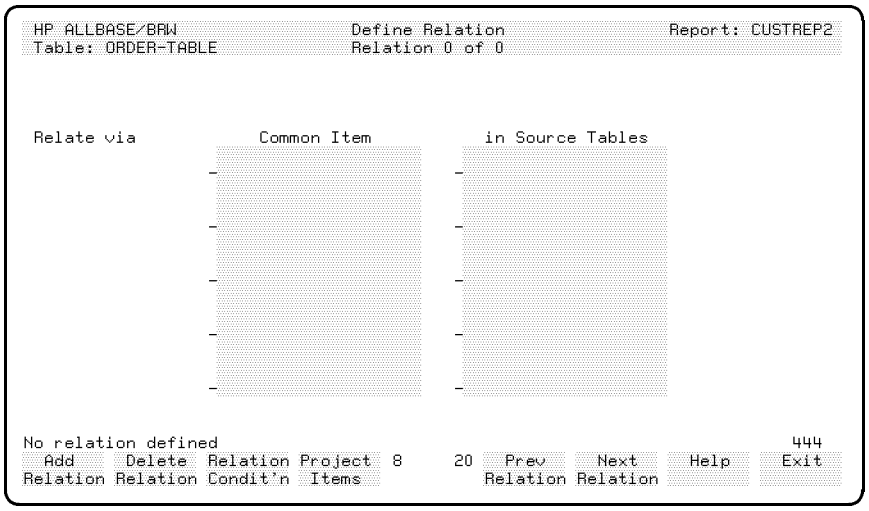
You can relate up to nine source tables to create the result table. However, for this report, we cannot join all the tables at once because they do not all contain the same common item.

Caution

If you do not specify a relation, BRW writes all possible combinations of records to the result table. For example, if you joined a table with 1000 records to a table with 500 records, there would be 500,000 possible combinations!

Define the relation

1. Choose `Define Relation` at the Define Table screen. The Define Relation screen appears.



2. Type `ORDER-NO` in the Common Item field.

3. Press Enter or choose `Add Relation`.

Notice that BRW automatically inserts the source table name and the second common item. This happens when there is an item of the same name and type in both joined tables. BRW assumes that the items are related.

The message `Relation Added` appears.

Each record in the result table (ORDER-TABLE) will contain a value for every item in both ORDERS and ORDER-DETAILS source tables.

Note

You can relate any item from one source table to any item in the other source table as long as they are of the same type. For example, you can relate any string to a string (the string size does not matter) or any numeric to a numeric, but you cannot relate a numeric item to a string item, a date item to an integer, or a fixed-point numeric to an integer.

The relationship needs to be logical for the report you are creating. BRW would allow you to, for example, relate CUSTOMER-NO to PRODUCT-NO, but the relationship would not produce any reasonable records. You would only get a record written to the table if, by chance, a customer number happened to be the same as a product number.

Exercise 3: Defining Relation Conditions

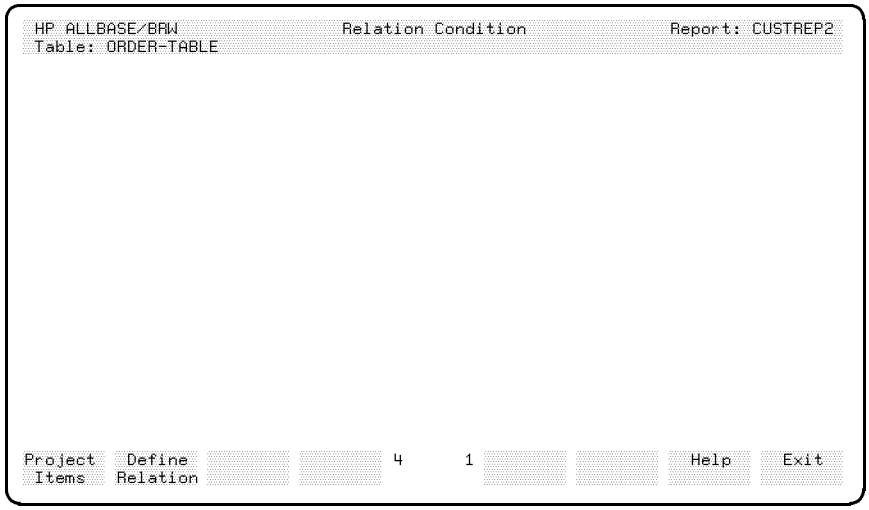
Because you have defined the relation on order number, the table ORDER-TABLE will contain those record where ORDER-NO in ORDERS in equal to ORDER-NO in ORDER-DETAILS. But this will include all orders placed in any month—not just those placed in June. You need to further restrict the records by using a **relation condition**.

The condition formula is expressed in terms of a **calculation language** that is fully described in the *HP ALLBASE/BRW Reference Manual*.

Define the relation condition

1. Choose `Relation Condit'n`.

   The Relation Condition screen appears. Other than the screen heading and the row of function labels at the bottom, this screen is blank.



2. Type the following formula:

   ```
   MONTH_OF (ORDER-DATE) = 6
   ```

   `MONTH_OF` if a standard, or pre-defined, function supplied with BRW. The `6` refers to the 6th month (June).

3. Use (Tab) to move to the next line.

4. Type the following comment on the line following the formula:

   ```
   << Selects only those orders placed in June. >>
   ```

   All text between the delimiters << and >> is a comment and is ignored.

5. Press (Enter).

Note

MONTH_OF extracts the month from any type of date item as long as the item is described in the BRWDIC (the BRW dictionary).

The relation condition you just added affects the table ORDER-TABLE only.

Error Checking

BRW checks for syntax errors in the formula immediately. Any errors messages generated are displayed on the screen at the time you enter the formula. You don't have to wait until the report is compiled.

Checking to see the items

You can make sure that the report will contain the data items you want by looking at the Project Items screen to see if the correct items are marked to be projected to the final report.

Check the items projected

1. Choose `Project Items`
2. Look at the list of Items and see if there is an X by all the items you want to be used in the ORDER-TABLE.
3. Also, look to see which item you want to use from this new table as a common item when you join it to the PRODUCTS data set. Specifically, notice `PRODUCT-NO`. Make sure it is marked to be projected.

```
 HP ALLBASE/BRW                 Project Items                Report: CUSTREP2
 Table: ORDER-TABLE                Type: J

         Item                 Source Table     Type Proj    Alias Name       NumPrec
 CUSTOMER-NO              ORDERS                S   X
-ORDER-DATE              -ORDERS               -D  -X -                      -
 ORDER-NO                 ORDER-DETAILS         S
 ORDER-NO                 ORDERS                S   X
-PRODUCT-NO              -ORDER-DETAILS        -S  -X -                      -
 QUANTITY                 ORDER-DETAILS         I   X
 SHIPMENT-DATE            ORDER-DETAILS         D   X
-TABLE-REC-NUMBER        -ORDER-DETAILS        -I  -  -                      -
 TABLE-REC-NUMBER         ORDERS                I   X

-                        -                     -   -  -                      -

-                        -                     -   -  -                      -

-                        -                     -   -  -                      -

First page                                                                    903
          Define   Relation           5      2   Prev     Next     Help     Exit
          Relation Condit'n                      Items    Items
```

4. Choose `Exit` to return to the Define Table screen.

Exercise 4: Relating Another Table

Relate the ORDER-TABLE to the PRODUCTS data set.

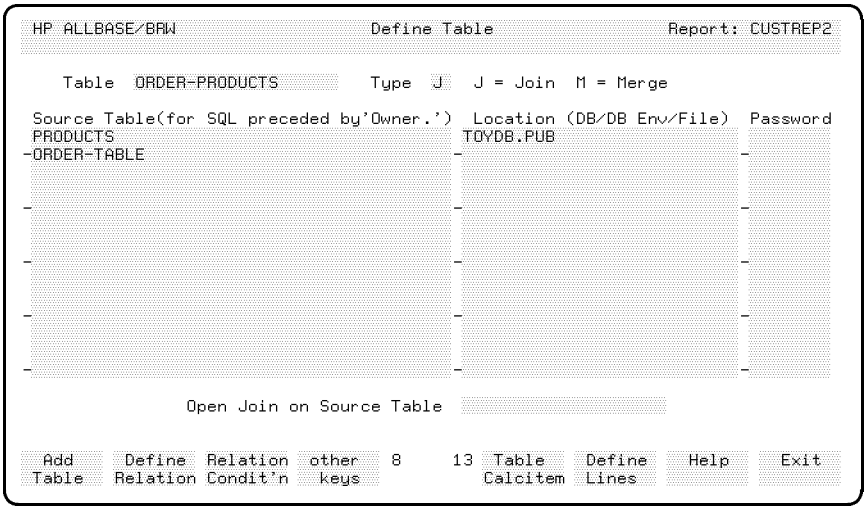
1. Overwrite the existing entries in the following fields with the new information:

Field name	New Entry
Table	`ORDER-PRODUCTS`
Source Tables	`PRODUCTS`
'	`ORDER-TABLE`
Location	`TOYDB.PUB` (or `TOYDB.PUB.ITF3000`)

   Be sure to blank out any extra characters.

   You don't need a Location for ORDER-TABLE since it only exists as part of this report, not as a physical file.

   Your screen should look like this:



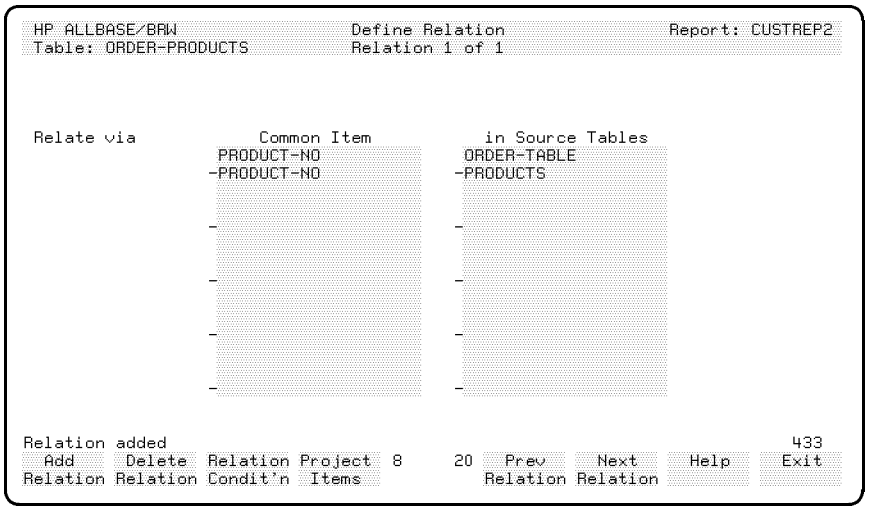
2. Choose `Add Table`. **DON'T** press Enter.

   If you pressed Enter at this point, you would be *renaming* the original table, not adding a table.

Define the relation

1. Choose `Define Relation`.
2. Type `PRODUCT-NO` in the first Common Item field.
3. Choose `Add Relation`.

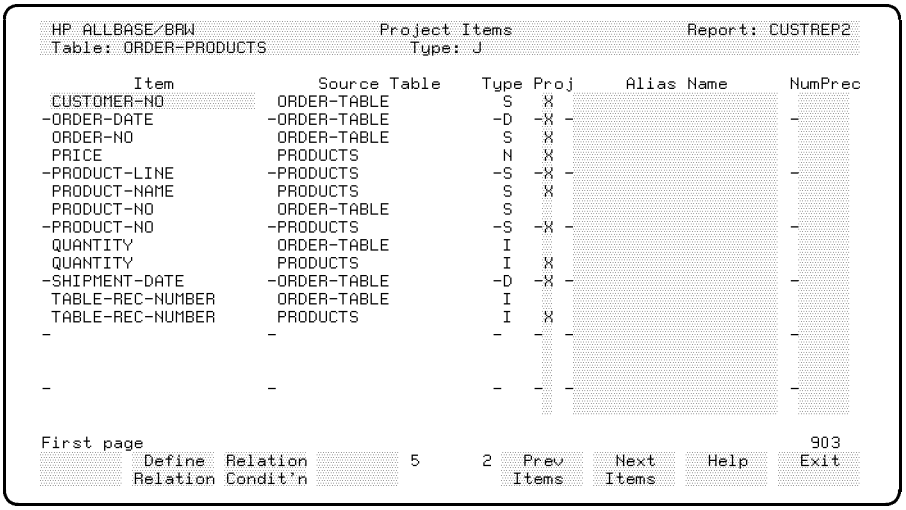
   Your screen should look like the next screen.



Each record written to the new table, ORDER-PRODUCTS, will contain all the items in the table ORDER-TABLE plus all the items from the PRODUCTS data set for each product number that occurs in the ORDER-TABLE.

In this case, you do not need a relation condition to restrict the records because you want all the records in ORDER-TABLE (which is already restricted). The only records that will be selected from PRODUCTS are those where the product number matches a product number in the ORDER-TABLE, that is, a product ordered in June.

To make sure you have the items you require, choose `Project Items`.



Items with Identical Names

Look at the Project Items screen. Notice that there are several items with the same name, PRODUCT-NO and PRODUCT-NO, QUANTITY and QUANTITY, TABLE-REC-NUMBER and TABLE-REC-NUMBER. To avoid confusion, if more than one data item has the same name, BRW projects only the item from the first source table mentioned on the Define Table screen.

In the case of PRODUCT-NO and PRODUCT-NO, it doesn't matter which one is projected since both of them are combined as the common item for the join. The TABLE-REC-NUMBER for the ORDER-TABLE and for the PRODUCTS table is the logical record number generated by BRW and it doesn't matter which of these items is projected. But in the case of QUANTITY and QUANTITY, they are two different items entirely. The QUANTITY in the PRODUCTS table is the quantity in stock. The QUANTITY in the ORDER-DETAILS table is the quantity ordered. For this report, you want the quantity ordered.

Modify the Project Items screen

1. Type X in the Proj field for the item QUANTITY from the ORDER-TABLE.
2. Type a space over the X in the Proj field beside QUANTITY from the PRODUCTS table.
3. Press Enter.

   A message tells you `Item projection modified`.
4. Choose `Exit` to return to the Define Table screen.

Note

Alias Names

If you had wanted *both* items in the report, you could project them both by putting and X in the Proj field for both items and giving one of the items an **alias name**. Thereafter, when you wanted to refer to that item, you would use the alias name instead of the actual name from the data source.

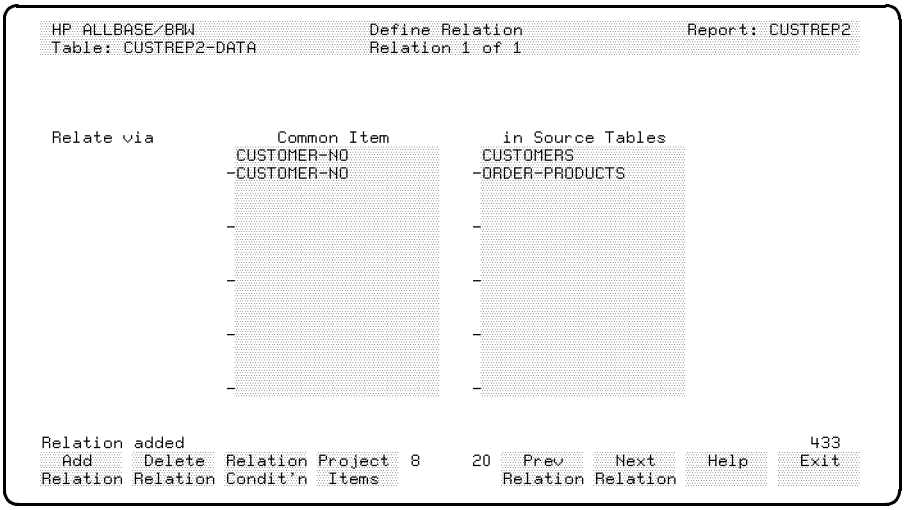
Final Table (CUSTREP2-DATA)

The last table you add to the report contains the customer details for each order.

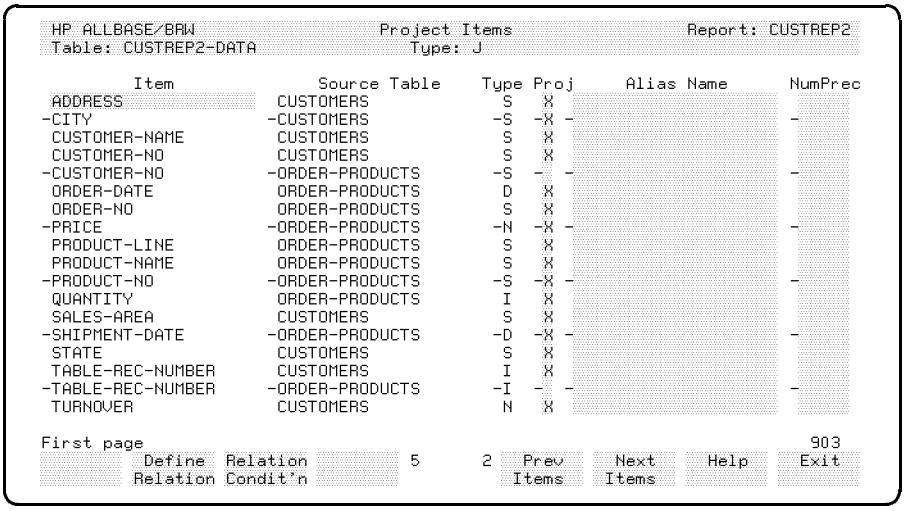
Create the CUSTREP2-DATA table

Try this one on your own. You have successfully created and joined the two other tables. This table consists of the CUSTOMERS data set joined to the ORDER-PRODUCTS table related by the CUSTOMER-NO item in each one. Begin at the Define Tables screen and then use the Define Relation screen. Remember to use `Add Table` and `Add Relation` so that you don't overwrite the previous table definition.

When you are finished, the Define Relation screen should look like this:



Use the `Project Items` screen to see if all the items you need are projected.



Using Quick Browse

Now the Project Items screen has more items than will fit on one screen. There are two ways to look at the rest of the items.

a. Choose `Next Items` to see the next screen of items and then choose `Prev Items` to return to the previous screen.

   Or . . .

b. In the first line of the Item field, type the name of one of the items you want to see, overwriting the item name already in that field. Be sure to space over extra characters from the previous item. Then press `Next Item`.

The next screen of items begins with the item you just typed.

For instance, if you typed `CUSTOMER-NAME` in the first Item field, this is the screen that appears:

```
HP ALLBASE/BRW                 Project Items                Report: CUSTREP2
Table: CUSTREP2-DATA              Type: J

        Item              Source Table     Type Proj    Alias Name      NumPrec
 CUSTOMER-NAME            CUSTOMERS           S   X
-CUSTOMER-NO             -CUSTOMERS          -S  -X -                   -
 CUSTOMER-NO              ORDER-PRODUCTS      S
 ORDER-DATE               ORDER-PRODUCTS      D   X
-ORDER-NO                -ORDER-PRODUCTS     -S  -X -                   -
 PRICE                    ORDER-PRODUCTS      N   X
 PRODUCT-LINE             ORDER-PRODUCTS      S   X
-PRODUCT-NAME            -ORDER-PRODUCTS     -S  -X -                   -
 PRODUCT-NO               ORDER-PRODUCTS      S   X
 QUANTITY                 ORDER-PRODUCTS      I   X
-SALES-AREA              -CUSTOMERS          -S  -X -                   -
 SHIPMENT-DATE            ORDER-PRODUCTS      D   X
 STATE                    CUSTOMERS           S   X
-TABLE-REC-NUMBER        -CUSTOMERS          -I  -X -                   -
 TABLE-REC-NUMBER         ORDER-PRODUCTS      I
 TURNOVER                 CUSTOMERS           N   X
-TURNOVER-MTD            -CUSTOMERS          -N  -X -                   -
 TURNOVER-PY              CUSTOMERS           N   X


           Define  Relation          5      2  Prev     Next     Help     Exit
         Relation  Condit'n                    Items    Items
```

You can see from this screen that you have all the items that you need for the report:

- CUSTOMER-NAME
- CUSTOMER-NO
- ORDER-NO
- PRICE
- PRODUCT-NO
- QUANTITY (quantity ordered, not quantity in stock)
- SALES-AREA
- TURNOVER MTD

At this point, your report will contain all the customers that have placed an order in June. It will not have any customers who *did not* place an order in June.

Defining an open join

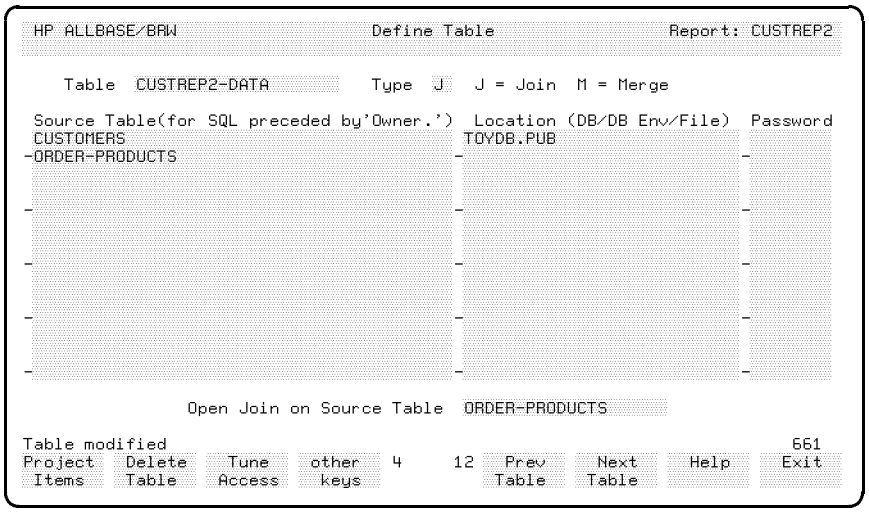
For this report, you do want to see the names of all the customers, even if they did not place an order in June. To do that, you must define an **open join**.

In an open join, all the items from the first source table listed are written to the report, even if there is no qualifying value (such as an order in the month of June) in the joined table.

Define an open join

1. At the Define Table screen, type `ORDER-PRODUCTS` in the `Open Join on Source Table` field.
2. Press Enter.

   The message `Table modified` appears.



3. Choose `Exit` to return to the Define Report screen.

   Notice that the Final Access Table field shows `CUSTREP2-DATA` as the Final Access Table for this report.

For this report, if a customer has made an order there will be an entry in the ORDER-PRODUCTS table and the data from that entry will be included in the report. If there has been no order, a NO-VALUE entry is written in the report. The result looks like this:

```
CUSTOMER-NO  CITY     STATE    ORDER-NO  ORDER-DATE  PRICE PRODUCT-NO

00002        HOUSTON  TEXAS    ORD-002   0603        1745  A00005
00006        CHICAGO  ILLINOIS -------   ----        ----  ------
```

In this illustration, NO-VALUE is represented by the character "-". You use the Item Edits screen to set the character to be printed for a NO-VALUE item.

For a more detailed explanation of open joins, see the *HP ALLBASE/BRW Reference Manual*.

LESSON 3: Quiz 1

Please answer the following questions. The solutions to these questions are supplied in Appendix A.

1. Name the three ways in which you can manipulate tables in BRW.
2. If you join two or more tables with the common item ORDER-NO, when will a record be written to the result table?
3. What happens if you do not define a relation when joining tables?
4. What is the effect of defining the following relation condition?

```
MONTH_OF (SHIPMENT-DATE) = 12
```

5. How can you make sure that an item that is present in a data set is not available for use in a report?
6. Is QUANTITY = 0 the same as QUANTITY = NO-VALUE? If not, why not?

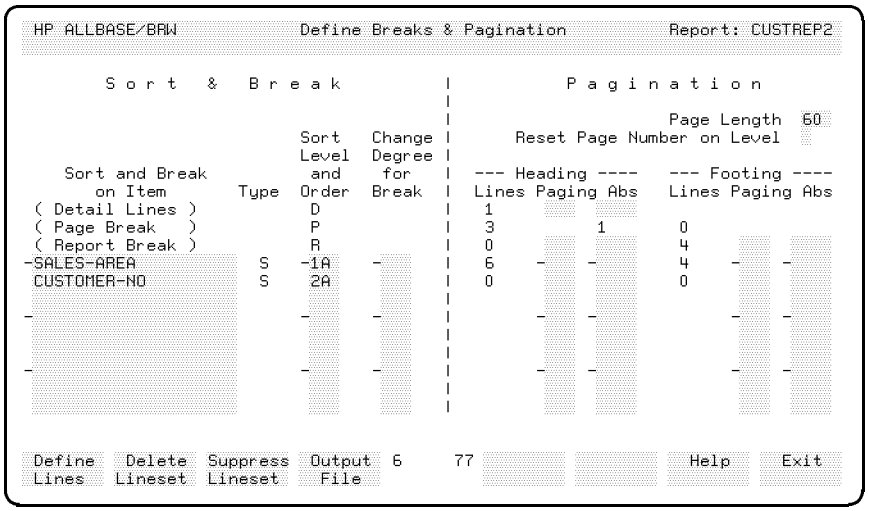
Exercise 5: Define the Sorts and Breaks

This exercise describes how to define sorts, breaks, and pagination, and how to suppress linesets. *It takes about 25 minutes.*

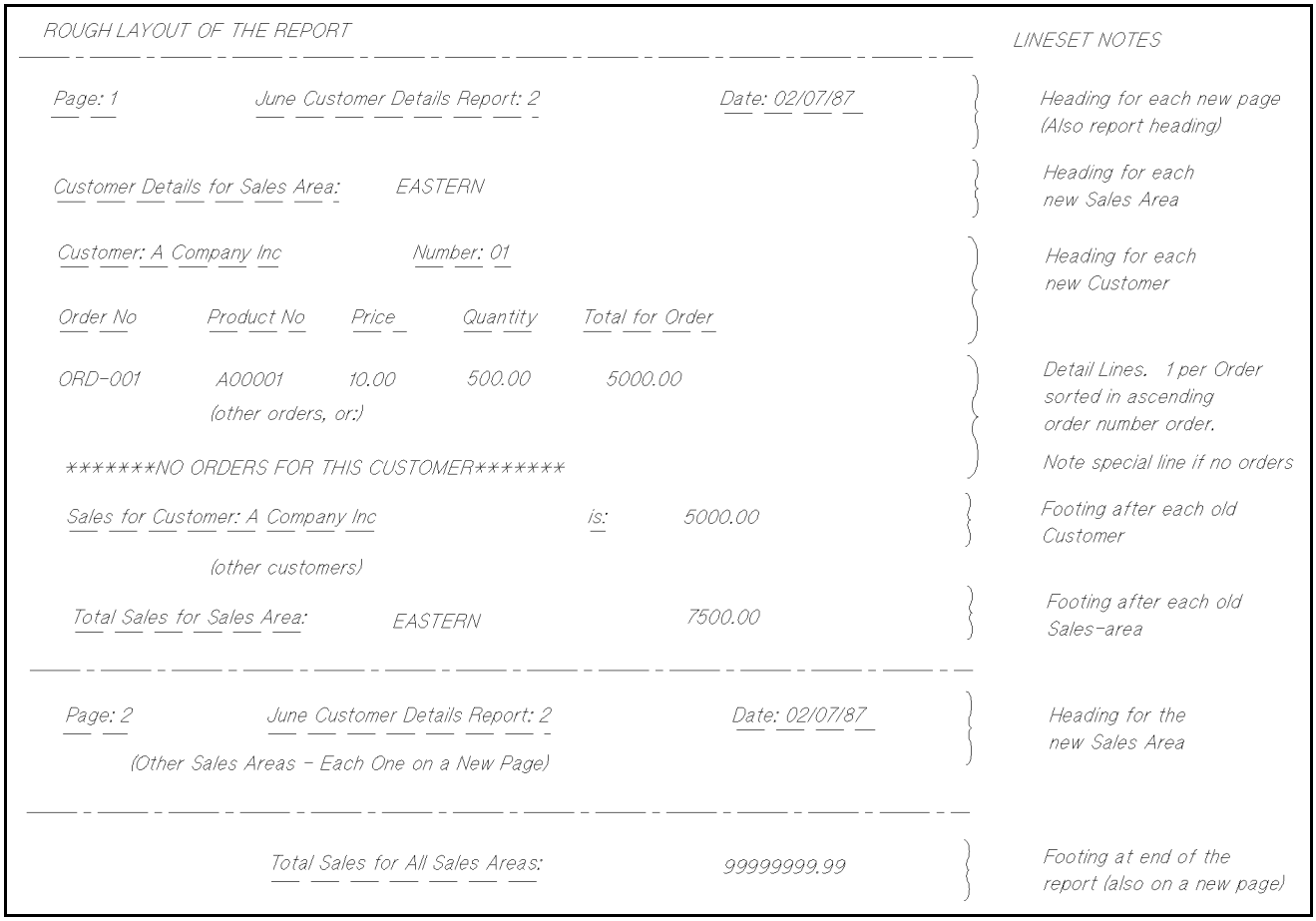
Define a break

1. Choose `Define Breaks` at the Define Report screen.

   The Define Breaks screen appears.



Look again at your rough sketch, shown on the next page.



The Lineset Notes column of the sketch show the linesets and breaks you need. The breaks on SALES-AREA and CUSTOMER-NO were already defined in the report CUSTREP1, from which you copied the report for this lesson. You still need to add the sort item, ORDER-NO, to print the details lines in ascending numerical order.

Define a sort and break

1. Add `ORDER-NO` in the Sort and Break on Item field below `CUSTOMER-NO`.
2. Type `3A` in the Sort Level and Order field. 3A means that the item is a third-level (3) break and the sort will be in ascending (A) order.
3. Press Enter.

This is how the screen will look:

```
 HP ALLBASE/BRW          Define Breaks & Pagination          Report: CUSTREP2

        S o r t   &   B r e a k          |           P a g i n a t i o n
                                         |
                                         |                   Page Length  60
                          Sort   Change  |      Reset Page Number on Level
                          Level  Degree  |
    Sort and Break         and    for    | --- Heading ----    --- Footing ----
       on Item      Type  Order  Break   | Lines Paging Abs    Lines Paging Abs
 ( Detail Lines )          D             |  1
 ( Page Break   )          P             |  3           1        0
 ( Report Break )          R             |  0                    4
-SALES-AREA          S    -1A    -       |  6     -    -         4    -    -
 CUSTOMER-NO         S     2A            |  0                    0
 ORDER-NO            S     3A            |  0                    0
-                         -      -       |        -    -              -    -
                                         |
                                         |
-                         -      -       |        -    -              -    -
                                         |
                                         |
Breaks and pagination modified                                           1117
 Define   Delete  Suppress  Output  6     77                   Help     Exit
 Lines    Lineset Lineset    File
```

The message tells you that the breaks and pagination are modified.

Set pagination

1. Look at the right side of the Define Breaks and Pagination screen.
2. Type 1 in the Reset Page Number on Level field. This resets the page number to 1 every time a level 1 break occurs.
3. Type `B` in the Paging field for the Report Footing. The `B` causes the new page to print *before* the report footing is printed.

```
 HP ALLBASE/BRW          Define Breaks & Pagination          Report: CUSTREP2

        S o r t   &   B r e a k          |           P a g i n a t i o n
                                         |
                                         |                   Page Length  60
                          Sort   Change  |      Reset Page Number on Level  1
                          Level  Degree  |
    Sort and Break         and    for    | --- Heading ----    --- Footing ----
       on Item      Type  Order  Break   | Lines Paging Abs    Lines Paging Abs
 ( Detail Lines )          D             |  1
 ( Page Break   )          P             |  3           1        0
 ( Report Break )          R             |  0                    5    B
-SALES-AREA          S    -1A    -       |  3     -    -         4    -    -
 CUSTOMER-NO         S     2A            |  7                    4
 ORDER-NO            S     3A            |  0                    0
-                         -      -       |        -    -              -    -
                                         |
-                         -      -       |        -    -              -    -
                                         |

 Define   Delete  Suppress  Output    6* 77                    Help     Exit
 Lines    Lineset Lineset    File      n
```

4. Press (Enter).

The message tells you that the breaks and pagination are modified.

Suppress linesets

1. Choose `Suppress Lineset`. This prompt appears:

   ```
   Specify lineset level (D,P,R,1..9):  and type (H,F):
   ```

2. Type `2` in the lineset level field.
3. Type `F` in the (H,F) field.
4. Press Enter.

   The Suppress Lineset screen for the Break Level 2 Footing on CUSTOMER-NO appears.

5. Type this command on the first line of the blank area:

   ```
   ORDER-NO = NO_VALUE
   ```

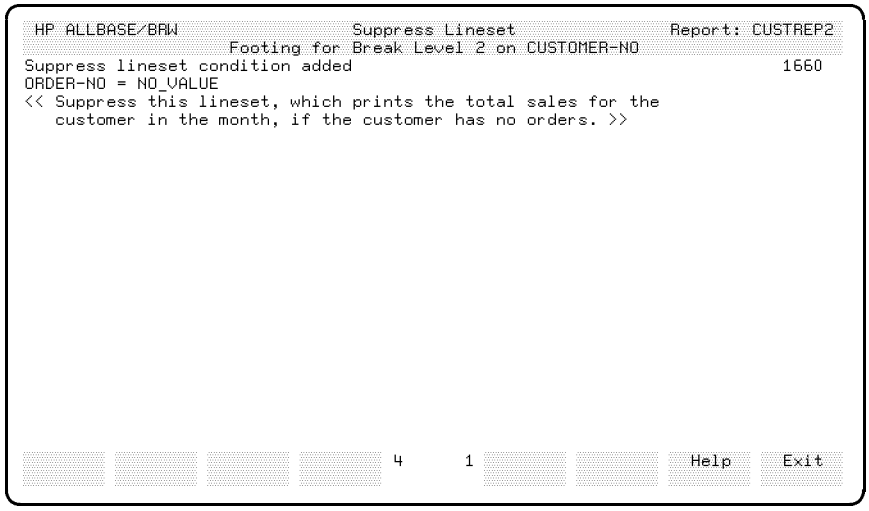
   This means that if a customer has no orders, the footer for that break will not print.

6. Type this comment:

```
<< Suppress this lineset, which prints the total sales for the
customer in the month,  if the customer has no order. >>
```

7. Press Enter.

   Your screen will look like this:



8. Choose `Exit` to return to the Define Breaks and Pagination screen.

Suppress a detail line

1. Choose `Suppress Lineset` again.
2. At the prompt, type `D` (for detail) in the lineset level field.

3. Press Enter.

   The Suppress Lineset screen appears for the detail lineset.

4. Type this formula in the blank area of the screen:

   ```
   ORDER-NO = NO_VALUE
   ```

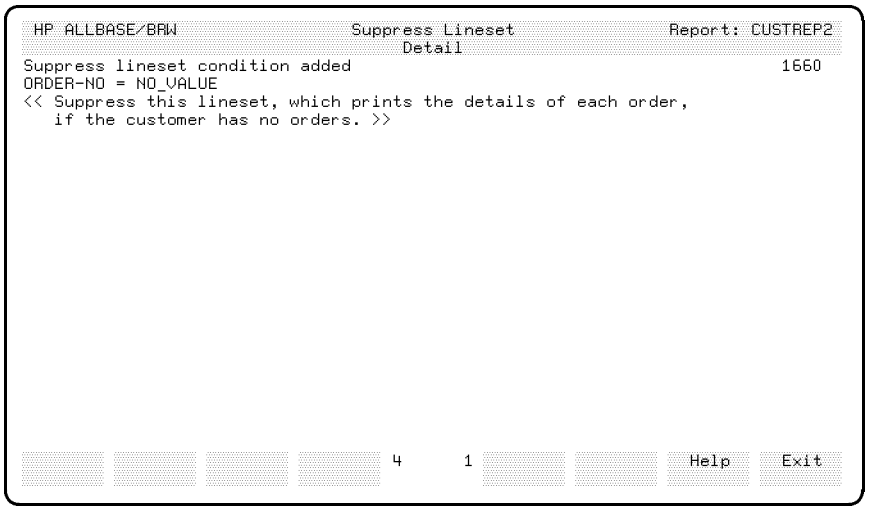
   Now, if a customer has no order, nothing will print on the detail line for that customer.

5. Type this comment:

```
<< Suppress this lineset, which prints the details of each order,
if the customer has no orders. >>
```

6. Press Enter.

   Your screen should look like this:



   The message tells you the Suppress Lineset condition was added.

7. Choose Exit to return to the Define Breaks screen.

LESSON 3: Quiz 2

Please answer the following questions. The solutions to these questions are supplied in Appendix A.

1. How would you specify printing a new page after the footing for break on CUSTOMER-NO?

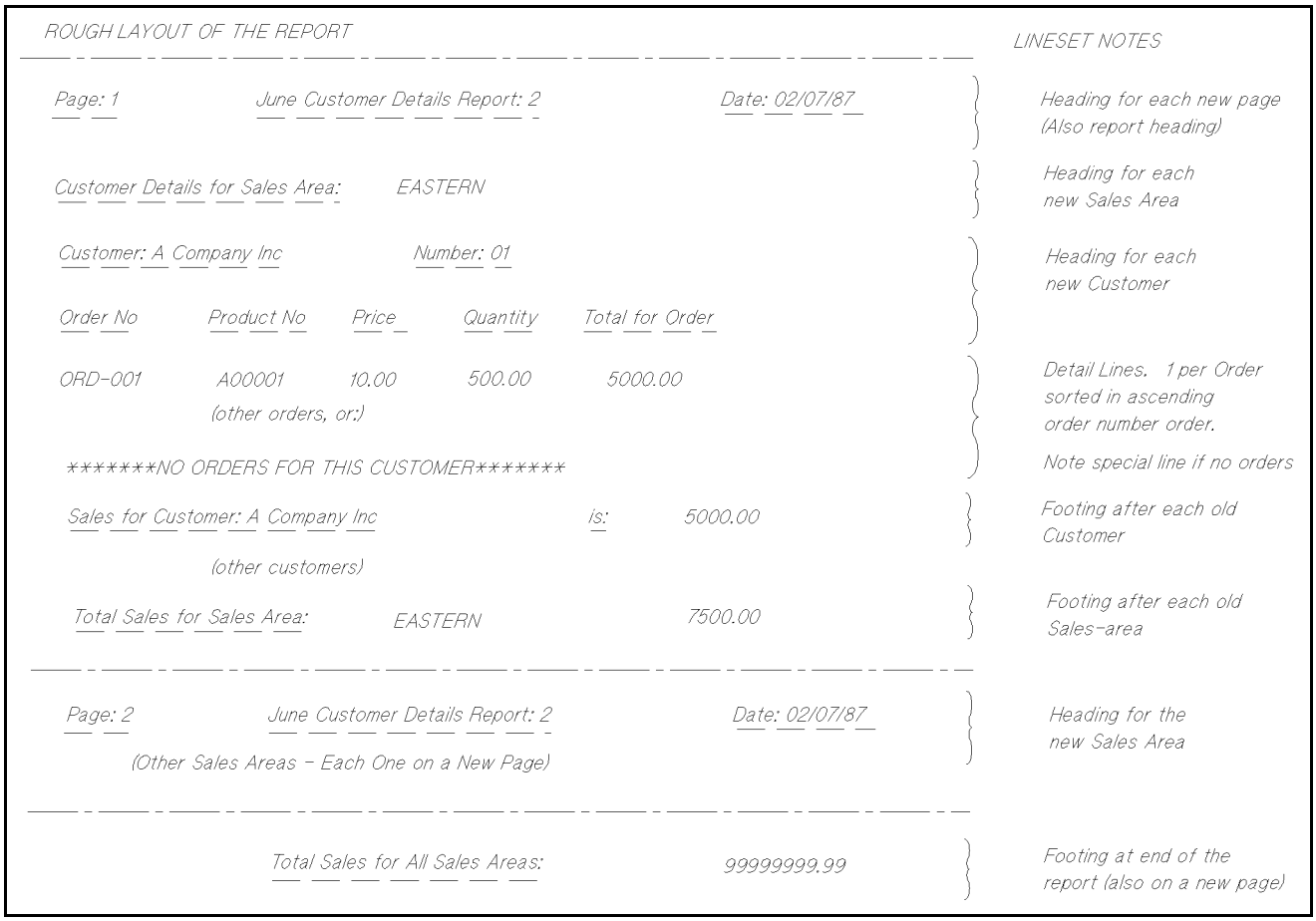
2. How would you make sure that the detail lineset was only printed when the item ORDER-NO was equal to ORD-011?

3. How would you specify printing a new page before each sales area without resetting the page number?

Exercise 6: Defining the Linesets

You define the linesets for the report in this section. The report uses multiple break level, layout calculated items, and suppresses certain lines. You will learn about the ColCalc (column calculation) field logic and how to specify source and reset levels for ColCalc. *This exercise takes 45 minutes.*

Look at the sketch again to see the linesets you need.



The report has seven linesets. If you need to review the linesets for this report in more depth, see the "Linesets for this Report" section, earlier in this chapter.

The Page Heading Lineset

Define the page heading lineset

1. Choose `Define Lines` from the Define Breaks screen.
2. At the `(D,P,R,1..9)` prompt, type `P` (for page).
3. At the `(H,F)` prompt, type `H` (for heading).
4. Press Enter.

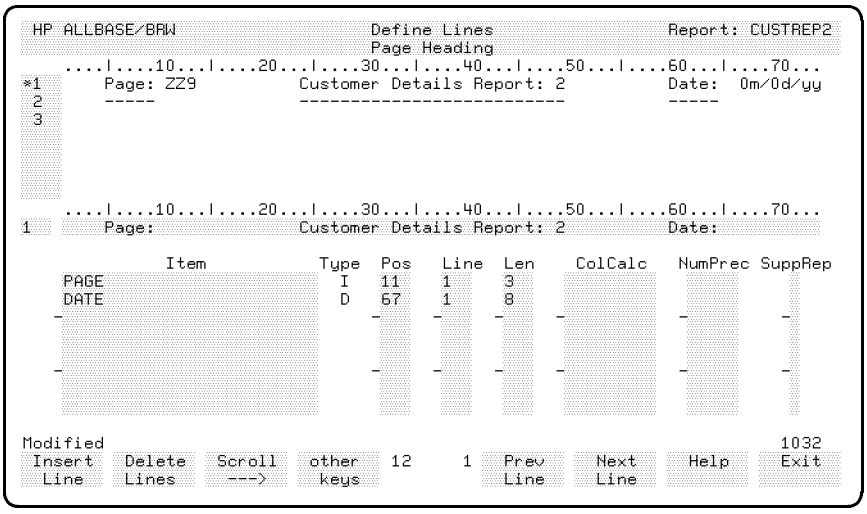
5. Look at the upper part of the Define Lines Page Heading screen.

   The screen contains the page heading information you used for the first report in Lesson 2.

6. Change the report heading to read as follows:

   ```
   Customer Details Report: 2
   ```

   The screen should now look like this:



Note

Did you remember how to get to the text in the upper part of the screen? Type the line number in the first small field in the lower part of the screen and type (or modify) the text shown in the longer field. When you press Enter, the text showing in the upper field reflects the changes.

If you want more details about how to use this screen, refer to the "Page Heading Lineset" section of Chapter 3.

The Level 1 Break Heading Lineset

Define the level 1 break heading

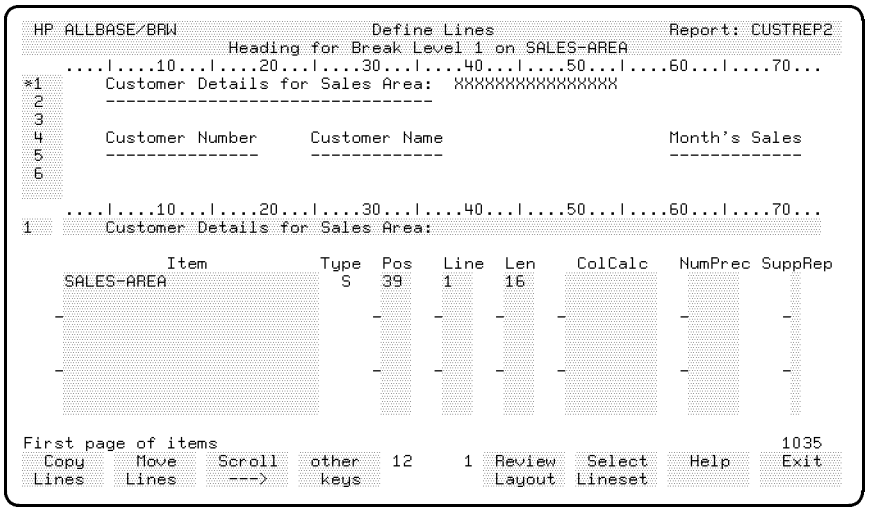
1. Choose `Select Lineset`

   (If `Select Lineset` does not appear on your function labels, choose `other keys` until it does.)

2. At the prompt, type `1` for the level 1 break and `H` for heading.

3. Press Enter.

   The Define Lines screen appears.

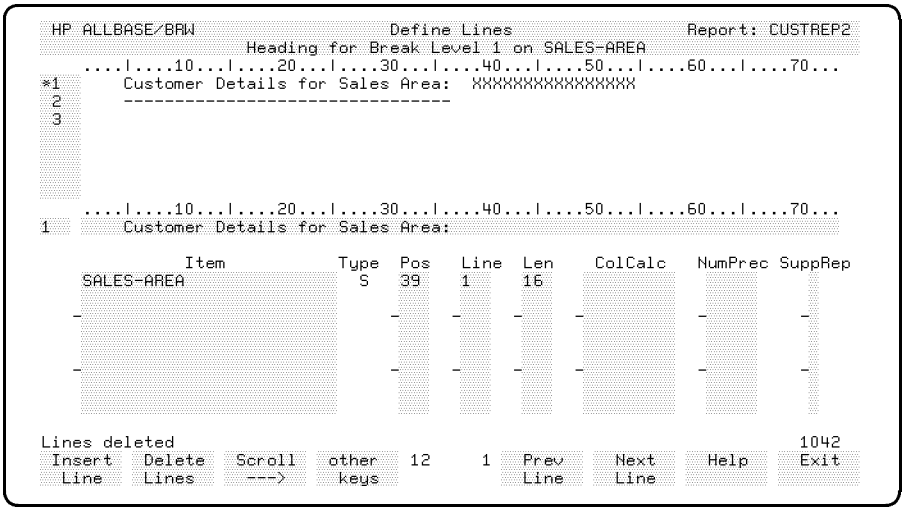


The screen shows the heading for break level 1 on SALES-AREA for the first report.

For the CUSTREP2 report you only need the new sales area in this break heading. You are going to put the customer information in the break level 2 heading. So, you can delete lines 4, 5, and 6 as described in the next steps.

4. Choose `other keys` until you see `Delete Lines`. Then choose `Delete Lines`.
5. At the prompt, type `4/6`.
6. Press Enter.

The final heading looks like this:

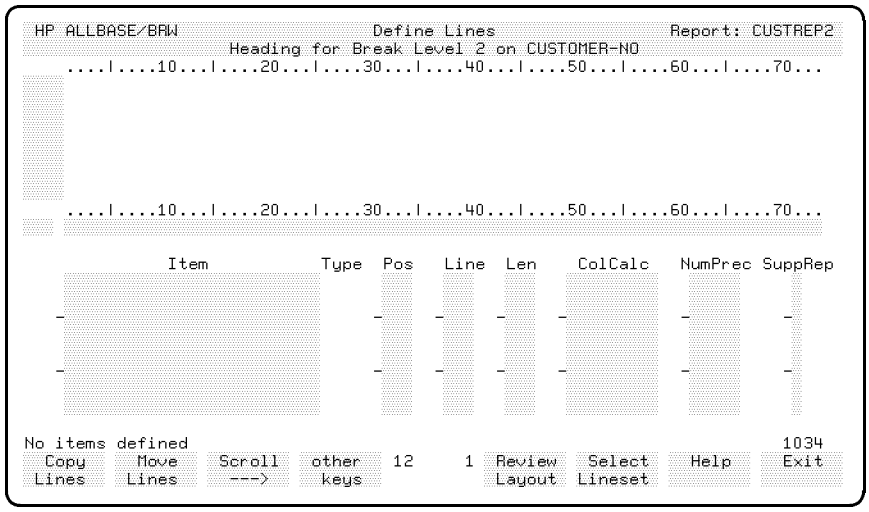


The Level 2 Break Heading Lineset

Define the level 2 break heading

1. Choose `Select Lineset`.
2. At the prompt, type `2` and `H` in the fields of the prompt.
3. Press Enter.

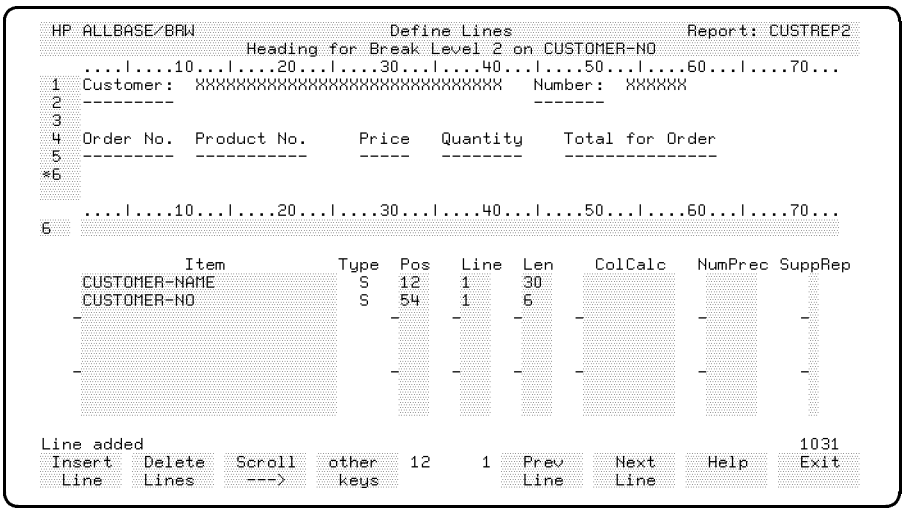
   This is the Define Lines screen for the break level 2 heading on CUSTOMER-NO.



   This screen contains blank fields because no break level 2 was defined for the previous report.

4. Look at the rough sketch again. The heading for the break on CUSTOMER-NO must print the name and number for the new customer as well as a heading for the details of each order.
5. Add the new text and fields for this break level. If you need to review the steps, look at examples from Lesson 2.

The screen will look like this:



Note

If you had put this heading in the detail lineset, a heading would be printed above *every* detail. You don't need that many headings. You only want the heading once at the beginning of each set of customers in a sales area.

Substituting a line

Look at the sketch. It shows a special line that is printed when a customer has no orders.

Define a "substitute" line

1. Type `6` in the line number field.
2. Type this line in the next field.

```
**********NO ORDERS FOR THIS CUSTOMER**********
```

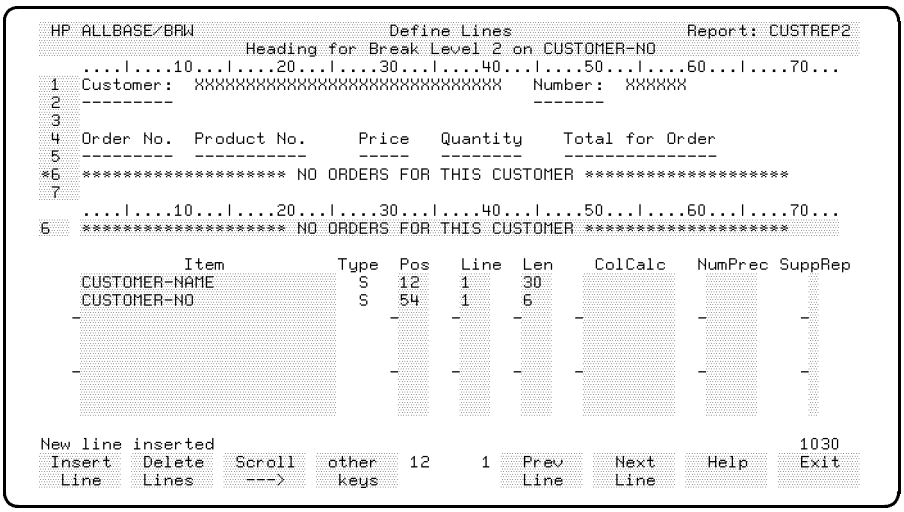
   (There are 20 asterisks on each side of the text. Don't waste a lot of time counting them—it's only for emphasis.)

3. Choose `Insert Line`.

   (DON'T press Enter, since that would *overwrite* the blank line 6. you want to keep that blank line.)

The new line is inserted before line 6. The lines after the new line are renumbered.

Your screen should now look like this:



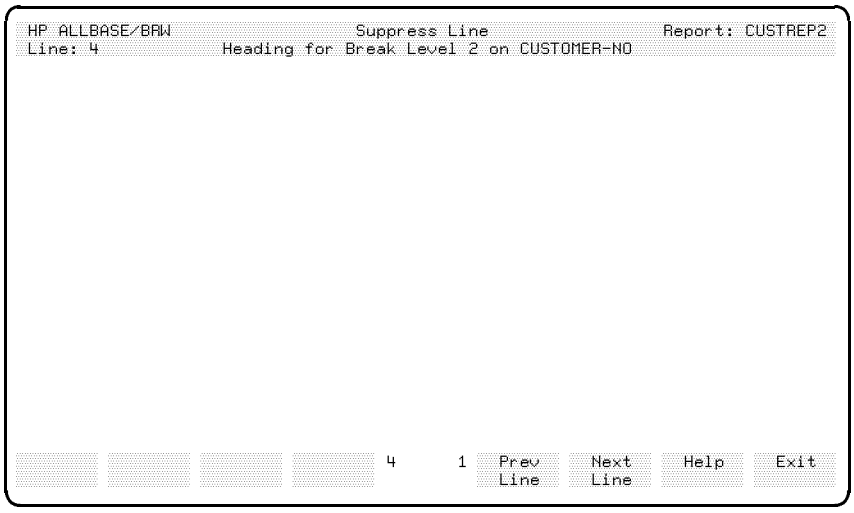
Suppressing lines

You don't always want to print the `NO ORDERS ...` line. When you do have a customer with no orders, you don't want to print the introduction lines (the column headings) for the details.

Suppress unneeded lines

1. Choose `Suppress Line`. (Use `other keys` if you need to bring up more function labels.)
2. At the `Suppress condition for line` prompt, type `4` to suppress line 4 (the headings for the details).
3. Press Enter.

   The Suppress Line screen appears.



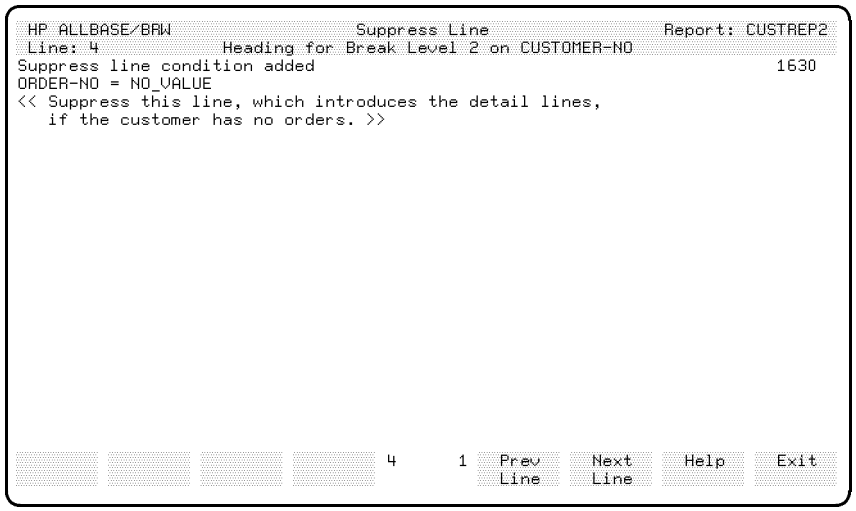
This screen is similar to the Suppress Lineset screen.

4. Type this text in the blank area provided:

```
ORDER-NO = NO_VALUE
<< Suppress this line, which introduces the detail lines,
    if the customer has no orders. >>
```

5. Press Enter.

   The prompt tells you that the Suppress Line condition was added.



6. Choose Next Line.

   The screen typing area of the screen appears blank. The left side of the screen heading shows that you are suppressing line 5.

7. Type the same suppress condition for line 5.

```
ORDER-NO = NO_VALUE
<< Suppress this line, which introduces the detail lines,
    if the customer has no orders. >>
```

8. Press Enter.

   Lines 4 and 5 will now be suppressed (not printed) when ORDER-NO equals NO_VALUE (no order number was found in that detail line meaning that there are no orders for that customer).

9. Choose Next Line to display the screen for line 6.

10. Type this suppress condition for line 6.

```
NOT (ORDER-NO = NO_VALUE)
<< Suppress this line, which warns if a customer has NO orders, if
the customer has an order. >>
```

11. Press (Enter).

    The line condition is added. When there is one or more orders for a customer, the warning line will not be printed.

12. Choose `Exit` to return to the Define Lines screen.

The Detail Lineset

You already have the column headings for the detail lines. Now you add the detail lines to the report.

Define the detail lineset

1. Choose `Select Lineset`.
2. At the prompt type `D` (leave the `H,F` prompt blank).
3. Press (Enter).
4. The Define Lines screen for the detail lineset appears.

```
 HP ALLBASE/BRW                     Define Lines                      Report: CUSTREP2
                                       Detail
     ....|....10...|....20...|....30...|....40...|....50...|....60...|....70...
*1      XXXXXX              XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX  ZZZZZZZZZZZZ9.99





     ....|....10...|....20...|....30...|....40...|....50...|....60...|....70...
1

                 Item             Type  Pos   Line  Len    ColCalc     NumPrec SuppRep
    CUSTOMER-NO                    S    5     1     6
    CUSTOMER-NAME                  S    25    1     30
   -TURNOVER-MTD                   N   -57   -1    -16   -            -       -


   -                                   -     -     -     -            -       -


First page of items                                                          1035
  Copy     Move    Scroll    other   12     1  Review  Select    Help     Exit
  Lines    Lines    --->     keys              Layout  Lineset
```

   The old line from the previous report is there. Your new report is just one line and should contain the order number, product number, price, quantity ordered, and the total for the order.

   The old line doesn't match what you need for the new report.

5. Delete the old line.

   (Use `other keys` to get to the `Delete Lines` function label. Type the line number at the prompt.)

   The prompt warns you `No line defined.`

   The items are still listed in the lower part of the screen. You don't need them either.

6. Press (Clear Display) or clear the items by spacing over them.
7. Press (Enter).

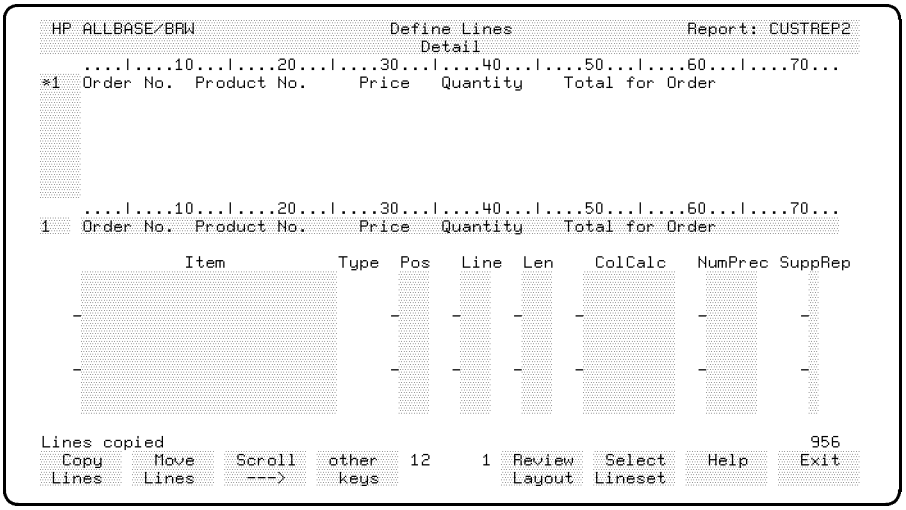
Copying lines

The items on the Detail line must line up with the headings that you have already defined on the level 2 break heading lineset (for the break on CUSTOMER-NO). You can ensure that the lines are correctly aligned by temporarily copying the lines from the level 1 lineset and using it as a template.

Copy lines from another lineset

1. Choose `Copy Lines`.
2. At the `Copy` prompt, type `4`, the number of the line that you want to copy.
3. At the next part of the prompt, `from lineset level`, type `2`, the number of the lineset level you want to copy from.
4. At the next part, `type` put `H` for heading.
5. Type `1` for the `to line` prompt.
6. Press Enter.

   BRW copies the line.

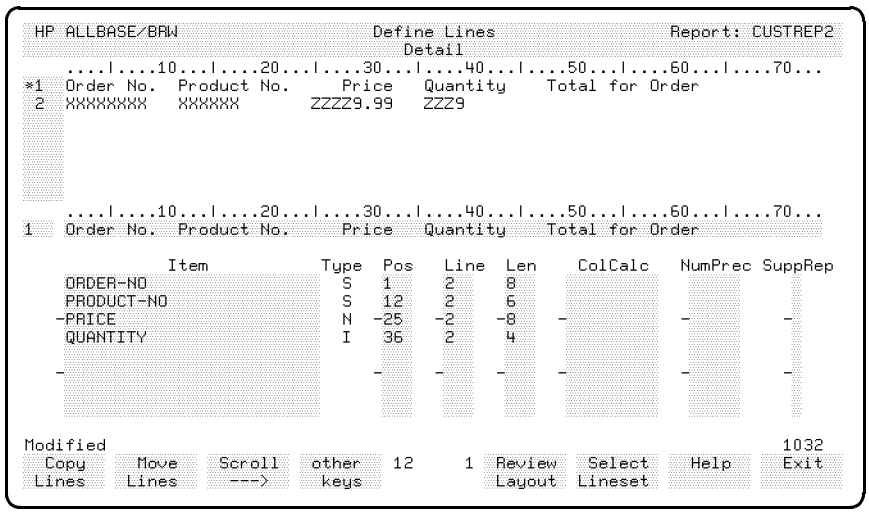


Now you can see how to align the items so they match the headings.

Adding the items

1. Type the infomation for the items ORDER-NO, PRODUCT-NO, PRICE, and QUANTITY in the lower part of the screen. Use the following figure as a guide.

Your screen should show the same `Pos` for the items as is shown on this screen:



2. Press Enter to have the items appear in the upper part of the screen. The fields for Type and Length are automatically filled in by BRW.

Using Layout Calculated Items

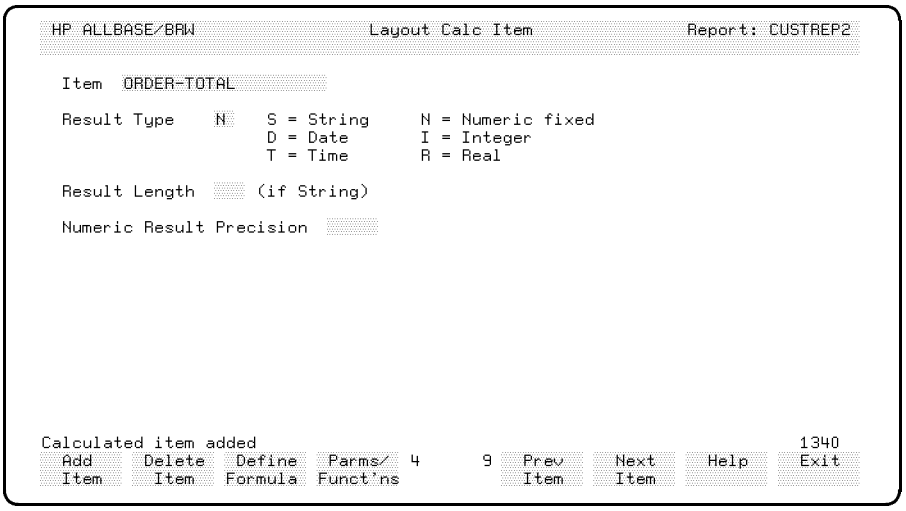
The total for orders is not part of the data set. BRW must calculate this total for the report. You define a formula for the calculation and BRW performs the calculation whenever a line is printed that contains the calculated item.

In this report, the calulation must multiply the quantity ordered by the price of the product.

Create a Layout Calculated Item

1. Choose `Layout Calcitem`.
2. Type `ORDER-TOTAL` in the Item field.
3. Type `N` in the Result Type field.
4. Press Enter or choose `Add Item`.

The Layout Calc Item screen below shows you how the calculation is set up.



Later you will learn to set the numeric precision of a result like this.

Define the formula

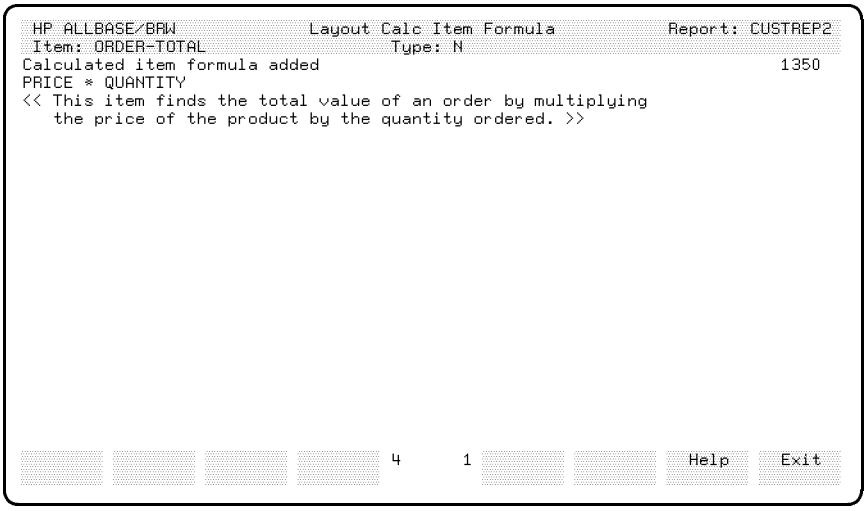
1. Choose `Define Formula`.

   The Layout Calc Item Formula screen appears. The blank area is where you type the formula.

   As with all formulas in BRW, you can use up to two screens. You can call user-defined functions, standard functions, or other calculated items. The formula cannot call itself (this is recursion and is not allowed in BRW).

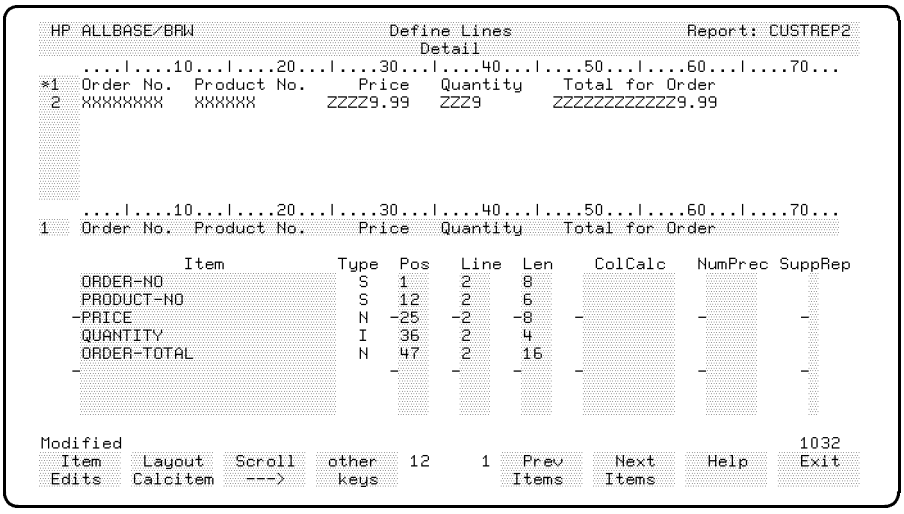
2. Type the formula:

```
PRICE * QUANTITY
<< This item finds the total value of an order by multiplying
   the price of the product by the quantity ordered. >>
```



3. Press Enter.
4. Press Exit twice to return to the Define Lines screen.
5. Type the name of the calculated item, ORDER-TOTAL, in the Item field below the item QUANTITY.
6. Type 47 for the Pos (position) field and 2 for the line.
7. Press Enter.

Your screen will now look like this:



You can see that each item is correctly aligned beneath the appropriate heading. (If they aren't correct, take some time to correct them now. You can alter the Len field to change the field length or change the Pos field to correct an alignment.)

When you are finished, you don't need the temporary heading line (line 1) anymore.

Delete the temporary heading

1. Choose `Delete Lines`.
2. At the prompt, type `1` for the line number you want to delete.

The temporary line is removed and the items are correctly aligned in the detail lineset.

The Level 2 Break Footing Lineset

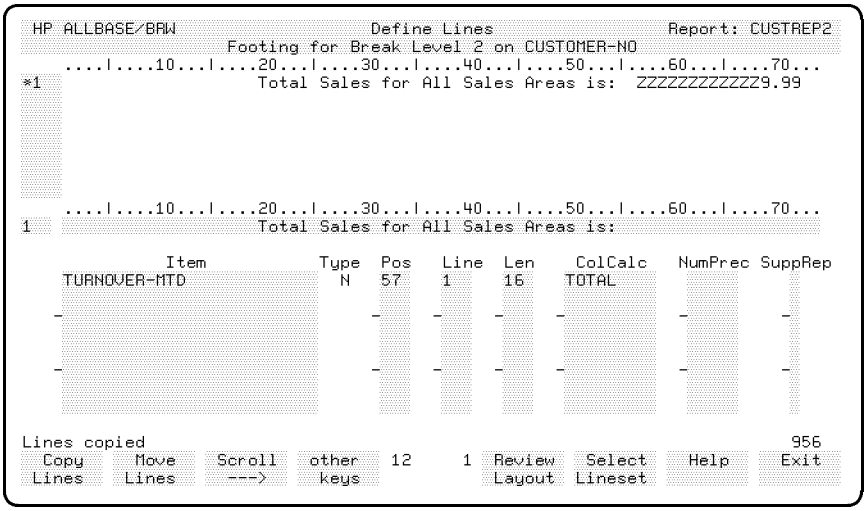
Define the level 2 break footing

1. Choose `Select Lineset`.
2. Select the level 2 lineset for the break footing by typing `2` and `F` at the prompt.

   The Define Lines screen for the break level 2 footing (CUSTOMER-NO) appears. Since there wasn't a break level 2 in the first report, nothing is defined for this break level footing yet.
3. Define the footing so that it prints the total sales for each customer. All the total lines must line up (start at the same character position).

   Use what you learned about `Copy Lines` from the previous section to copy line 2 from the report footing lineset to line 1 of this lineset. The copied line will help you to see where the total sales for the customer must be printed and make sure the detail lines match the headings.

When you finished the screen should look like this:



4. Type 1 in the line number field.
5. Start at character position 1 in the text field and type:

   `Sales for Customer:`

6. Space over the other characters in the text field up to, but not including the text `is:`
7. Press Enter.

   The item field for the total will still appear on the layout.

8. Type `CUSTOMER-NAME` in the Item field below `TURNOVER-MTD`, put it in character position 21 on line 1.
9. Press Enter.

Add a blank line above line 1

1. Type 1 in the line number field.
2. Space over the text (or use Clear Line) in the text field.
3. Choose `Insert Line`.

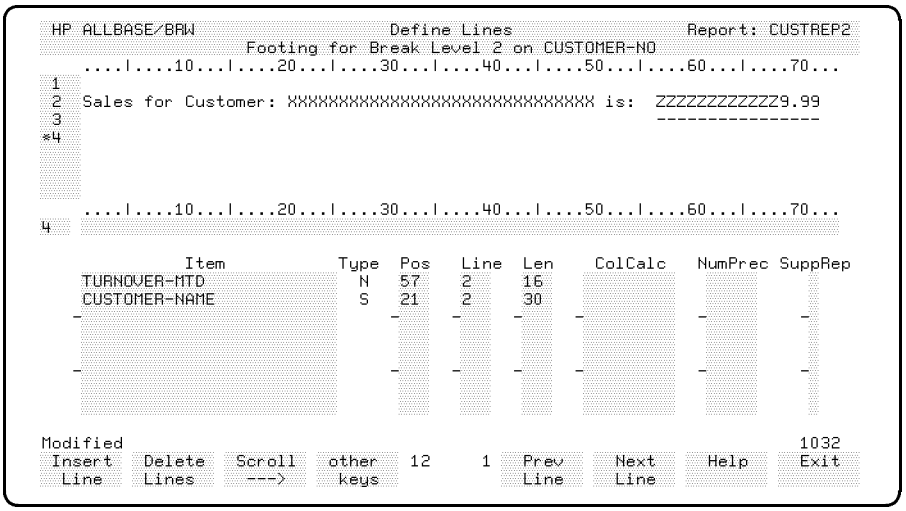
   Line 1 becomes line 2. The new line 1 is a blank line.

4. Create line 3 and use it for the underline under the total.
5. Create a blank line for line 4.
6. Space over the word `TOTAL` in the ColCalc field.

   You want the actual turnover amount, not the total.

7. Press Enter.

Your screen should look like this next example.



The Level 1 Break Footing Lineset

Define the level 1 break footing

1. Choose `Select Lineset` and specify lineset level 1, type F.

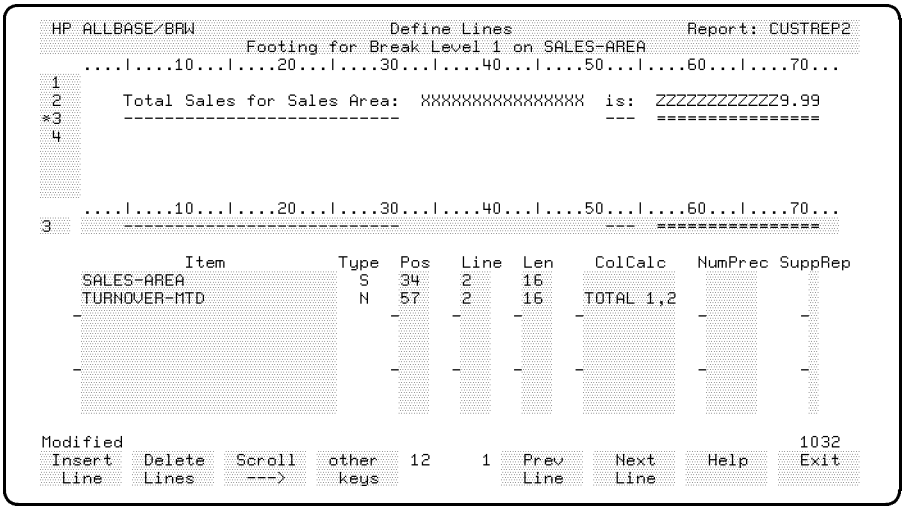
   The screen shows the footing for break level 1 on SALES-AREA from the previous report. You can use much of this lineset that you copied from the first report.

2. Look at your sketch for this report. The new lineset for the break on sales area is identical to the old one, except for some new underlining.

3. Change the word `TOTAL` in the ColCalc column for TURNOVER-MTD to `TOTAL 1,2` .

4. Press Enter.

The break footing lineset is complete. The screen looks like this:



Note

In your first report, using the column calculation of TOTAL, BRW printed a running total for that item. Each time a detail line is written, the value for that item is added to the running total. With BRW, the default source level is the detail line.

With the column calculation of TOTAL for TURNOVER-MTD on the SALES-AREA break, the total is reset to 0 after each break on a new sales area. If you use TOTAL for TURNOVER-MTD on the Report Footing, the total is not reset to 0 until it reaches the break on the report footing (the end of the report). With BRW, the default reset level is the lineset in which the item occurs.

The defaults for the TOTAL calculation are entered as `1` (reset on the lineset level where the item occurs) and `1` (use the detail line as the source level).

For the current report, you want the value to be reset every time the SALES-AREA changes (lineset level 1). But you do not want the value from each detail line, just the value for each customer. You get this value from the line printed when the CUSTOMER-NO changes on the level 2 break for CUSTOMER-NO. So, you define TOTAL as `TOTAL 1,2`.

(TURNOVER-MTD is defined once per customer, not once per order.)

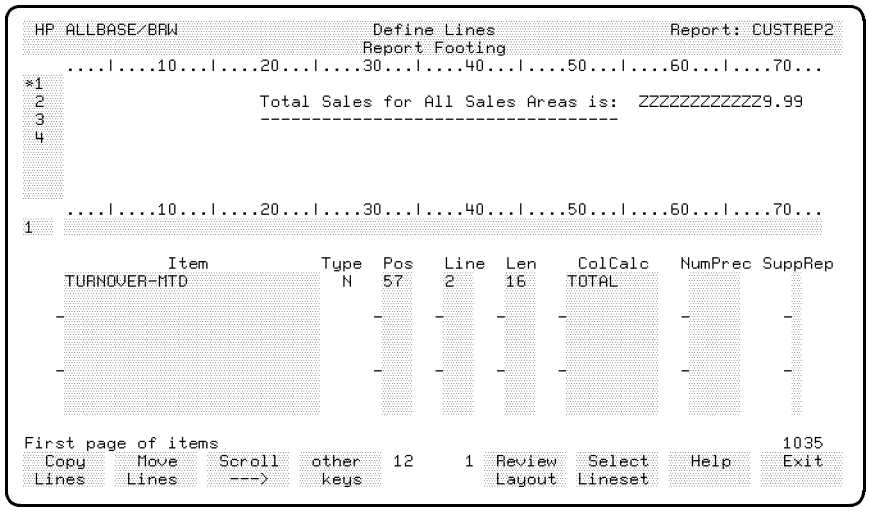
A more complete description of the ColCalc entries is found in the *HP ALLBASE/BRW Reference Manual*.

The Report Footing Lineset

This is the final lineset for this report.

Define the report footing

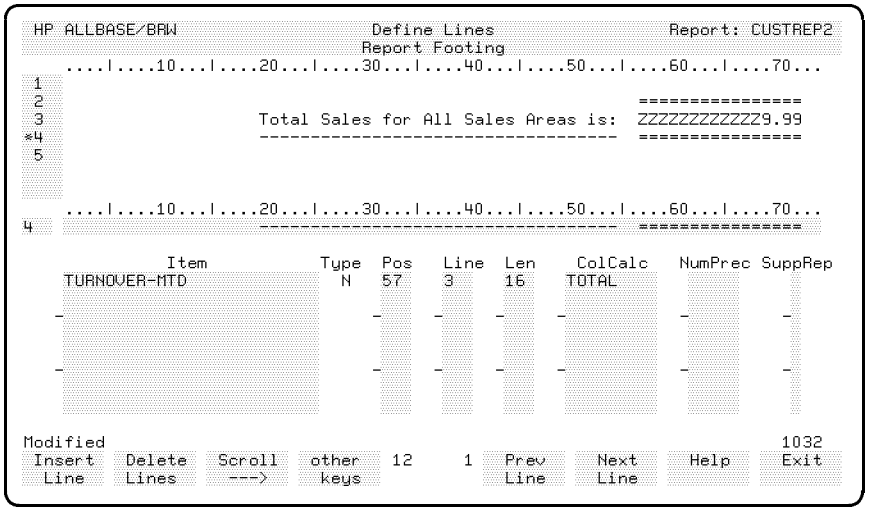
1. Choose `Select Lineset` for a report footing (R and F).



The rough sketch shows that the report footing will print the total sales for all sales areas.

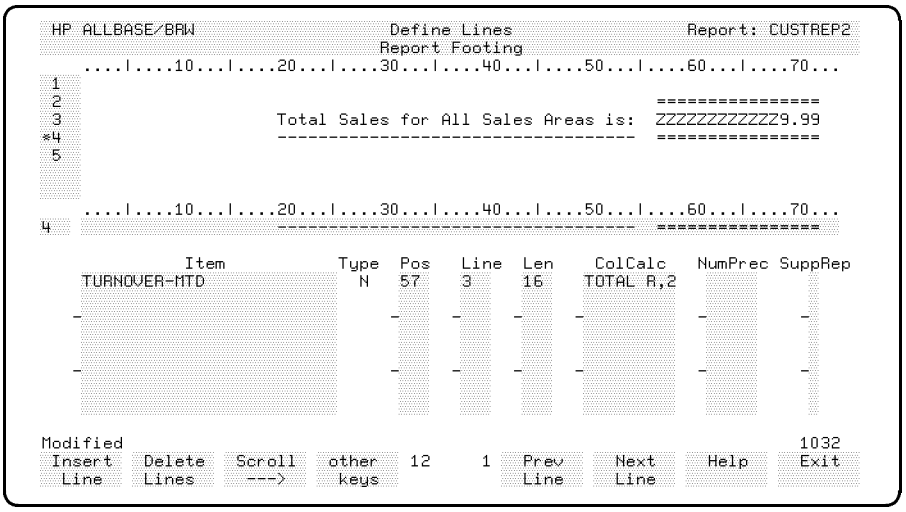
2. Add two lines to emphasize the total. Create a line with double underlining (using equal signs) *above* the current total line and a line with double underlining *under* the current total.

   The screen will look like this:



3. Adjust the TOTAL in the ColCalc field for TURNOVER-MTD to reset on the report break level (R) and take values from the break on CUSTOMER-NO (level 2).

The final report footing should look like this:



LESSON 3: Quiz 3

Please answer the following questions. The solutions to these questions are supplied in Appendix A.

1. What are the differences between Suppress Line and Suppress Lineset?

2. When is a layout calculated item calculated? And when is a **table calculated item** calculated?

3. Can you sort and break on a layout calculated item? If not, why not?

4. Once defined, can you use a layout calculated item in a formula?

5. If the ColCalc field for item TURNOVER-MTD on a break footing shows AVG, what will BRW calculate and print for that item?

6. What will BRW calculate and print if the ColCalc field in the above question showed AVG 1,2?

Exercise 7: Reviewing the Layout

Your report is now ready to be compiled. But, before you compile it, you can review the layout to see, online, how the report will look when printed. *This section takes 5 minutes.*

Review the layout

1. Use `other keys` until `Review Layout` is displayed.
2. Choose `Review Layout`.

   BRW displays the following screen:

```
HP ALLBASE/BRW                    Review Layout                    Report: CUSTREP2

      ....|....10...|....20...|....30...|....40...|....50...|....60...|....70.
  PH1>    Page: ZZ9          Customer Details Report: 2          Date:  0m/0d/
  PH2     -----              --------------------------          -----
  PH3
 1BH1     Customer Details for Sales Area:  XXXXXXXXXXXXXXXX
 1BH2     --------------------------------
 1BH3
 2BH1 Customer:  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX   Number:  XXXXXX
 2BH2 ---------                                     -------
 2BH3
 2BH4 Order No.  Product No.     Price   Quantity    Total for Order
 2BH5 ---------  -----------     -----   --------    ---------------
 2BH6 ******************** NO ORDERS FOR THIS CUSTOMER ********************
 2BH7
   D1 XXXXXXXX   XXXXXX      ZZZZZ9.99   ZZZZ9      ZZZZZZZZZZZZ9.99
 2BF1
 2BF2 Sales for Customer: XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX is:  ZZZZZZZZZZZZ9.99
 2BF3                                                           ----------------
 2BF4
 1BF1
      ....|....10...|....20...|....30...|....40...|....50...|....60...|....70.

 Define  Print   Scroll  Scroll  1      1  Prev    Next    Help    Exit
 Lines   Layout  <---    --->             Page    Page
```

   Every line of every lineset is shown on the Review Layout screen. You can go to Review Layout from any Define Lines screen to see if the lines are correctly aligned. Make changes if necessary.

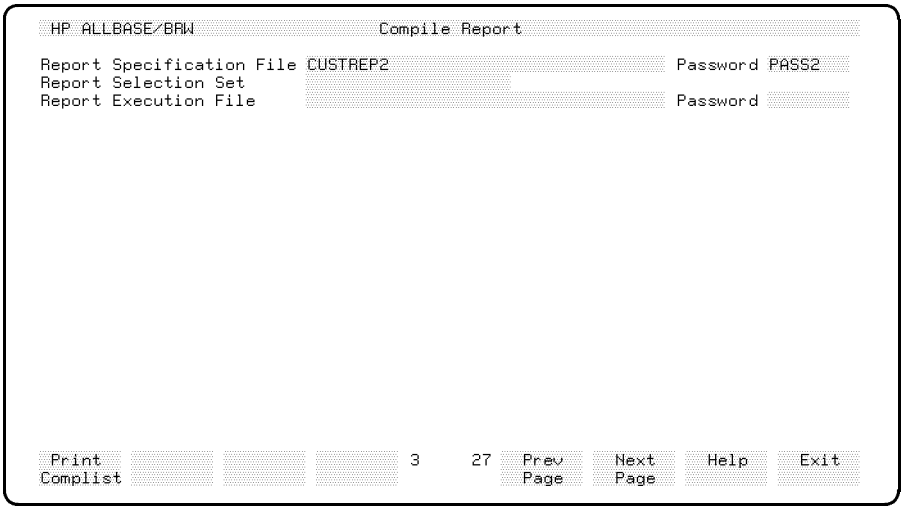
3. Choose `Exit` to return to the Define Report screen.

Exercise 8: Compiling The Report

In this section you compile the report **specification file** to produce a report **execution file**. *This section takes 5 minutes.*

Compile the report

1. Choose `Exit` to return to the Select Report screen.
2. Choose `Compile Report`. BRW displays the Compile Report screen.



Naming the Execution File

Before you compile the report, you must assign a name for the Report Execution File. You can save the execution file in a different group, for example, group BRWEXEC, and then the execution file can have the same name as the specification file. You can assign a password to the execution file if you wish. (If you save the execution file in the same group as the specification file then you will have to give the execution file a different name.)

Name the execution file

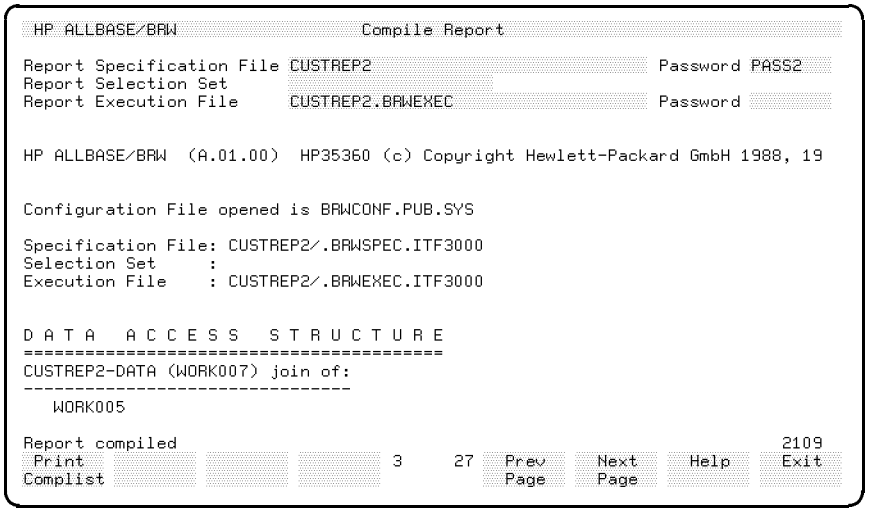
1. Type `CUSTREP2.BRWEXEC` in the Report Execution File field.

   If you don't have a BRWEXEC group in your account, type a unique file name for your execution file (for instance, CUSTR2X). Remember the name you use, you'll need it whenever this tutorial asks you to enter the report execution file name for this report.

2. Press Enter.

   BRW compiles the report.

When the compilation is finished, the screen display will be similar to the following.



The message "Report compiled" tells you that the compile was successful. You can read the compilation listing from the screen or print it out by pressing the `Print Complist`. The compilation listing tells you how the data was accessed under the heading DATA ACCESS STRUCTURE. The *HP ALLBASE/BRW Reference Manual* discusses how to use the compilation listing to improve the performance of reports.

If the compilation failed, the compilation listing will also include error messages.

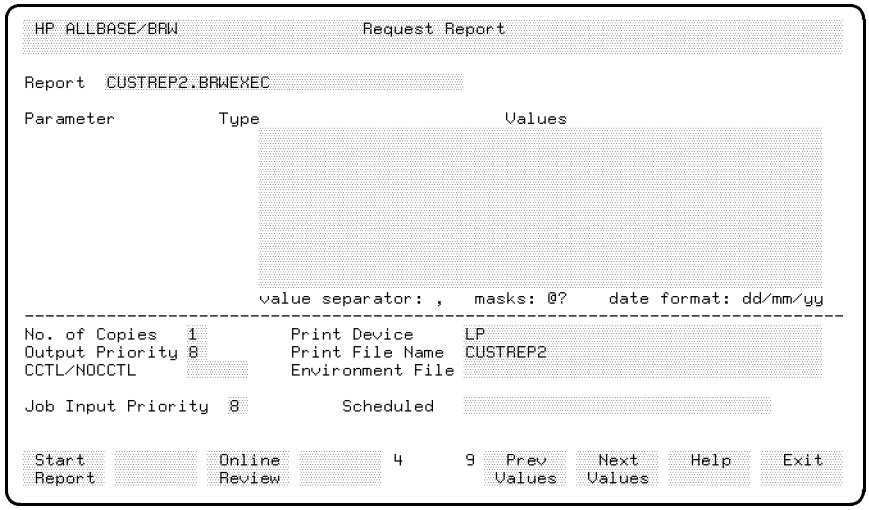
3. Choose `Exit` to return to the Select Report screen.

Exercise 9: Requesting The Report

When you request the report, BRW streams a job that runs the execution file to produce the report.

Request the report

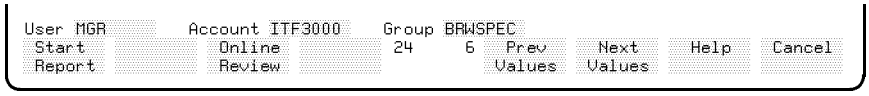
1. Type the name of the execution file, `CUSTREP2.BRWEXEC`, in the Report field.
2. Choose `Request Report`.



3. Choose `Start Report`.

   BRW prompts for the User, Group, and Account for the job. The default User, Group, and Account are the logon ones.

4. You want to keep the default, so choose `Start Report` again.



   BRW now prompts for the User, Account, and Group passwords for the job. There were no passwords set up for the tutorial account when it was shipped from Hewlett-Packard.

5. If you have set passwords, first type them in the appropriate fields. If you have not set passwords, go on to the next step.
6. Choose `Start Report` again.

```
User Password            Account Password            Group Password
 Start          Online               24    15   Prev     Next     Help    Cancel
 Report         Review                          Values   Values
```

BRW displays the message `Job streamed, Job number is #J`*nnn*.

See how the job is progressing

1. Choose `Exit` to return to the Select Report screen.
2. Choose `other keys`.
3. Choose `Show Jobs`.

   BRW displays a screen similar to the next screen shown here.

```
 HP ALLBASE/BRW                         Select Report

Report  CUSTREP2

Show Files            of Group

THU, FEB 15, 1990,  6:48 PM

JOBNUM  STATE IPRI JIN  JLIST    INTRODUCED  JOB NAME
#J1589  EXEC        10S LP       MON  2:13P  CUSTREP2,MGR.ITF3000

JOBFENCE= 1; JLIMIT= 20; SLIMIT= 60







First page                                                                700
  Show     Show      Print    other   3      9   Prev     Next     Help    Exit
 Files     Jobs               keys               Page     Page             BRW
```

Your job status will be displayed. If the job does not appear, it may already have finished. In that case, go to the printer to collect the report or look at the $STDLIST file.

Example Printouts

Your report should look like the illustrations on the following pages.

```
    Page:   1          Customer Details Report: 2          Date:  04/20/92
    -----              --------------------------          -----

    Customer Details for Sales Area:  EASTERN
    --------------------------------
Customer:  FOURTH ESTATE MAGAZINES          Number:  000004
---------                                   -------

Order No.  Product No.     Price   Quantity    Total for Order
---------  -----------     -----   --------    ---------------
ORD-004    A00002          12.50      1                12.50

Sales for Customer: FOURTH ESTATE MAGAZINES        is:             12.50
                                                                -----------

    Total Sales for Sales Area:  EASTERN           is:             12.50
    --------------------------                     ---  ================
```

```
    Page:   1          Customer Details Report: 2          Date:  04/20/92
    -----              --------------------------          -----

    Customer Details for Sales Area:  NORTHERN
    --------------------------------

Customer:  7-UP NOVELTIES                   Number:  000007
---------                                   -------

******************** NO ORDERS FOR THIS CUSTOMER ********************

Customer:  EIGHT-BALL CUES INC              Number:  000008
---------                                   -------

Order No.  Product No.     Price   Quantity    Total for Order
---------  -----------     -----   --------    ---------------
ORD-011    A00004          15.25     63               960.75
ORD-012    A00008           0.95      2                 1.90
ORD-013    A00003           1.25      1                 1.25
ORD-014    A00002          12.50      6                75.00

Sales for Customer: EIGHT-BALL CUES INC            is:          1038.90
                                                                -----------

    Total Sales for Sales Area:  NORTHERN          is:          1038.90
    --------------------------                     ---  ================
```

```
    Page:   1          Customer Details Report: 2          Date:  04/20/92
    -----              --------------------------          -----

    Customer Details for Sales Area:  SOUTHERN
    ---------------------------------

Customer:  SECOND GOODS INC.                Number:  000002
---------                                   -------

Order No.  Product No.     Price   Quantity    Total for Order
---------  -----------     -----   --------    ---------------
ORD-002    A00005          17.45      5                 87.25
ORD-008    A00007           1.75     25                 43.75
ORD-010    A00003           1.25      3                  3.75

Sales for Customer: SECOND GOODS INC.              is:           136.55
                                                              ----------

Customer:  FIFTH AVENUE FASHIONS            Number:  000005
---------                                   -------

Order No.  Product No.     Price   Quantity    Total for Order
---------  -----------     -----   --------    ---------------
ORD-005    A00001           0.75     15                 11.25
ORD-006    A00005          17.45      2                 34.90

Sales for Customer: FIFTH AVENUE FASHIONS          is:            46.15
                                                              ----------

    Total Sales for Sales Area:  SOUTHERN          is:           182.70
    ---------------------------                    ---  ==========
```

```
    Page:   1          Customer Details Report: 2          Date:  04/20/92
    -----              --------------------------          -----

    Customer Details for Sales Area:  WESTERN
    ---------------------------------

Customer:  FIRST REALTY INC.                Number:  000001
---------                                   -------

Order No.  Product No.     Price   Quantity    Total for Order
---------  -----------     -----   --------    ---------------
ORD-001    A00003           1.25     10                12.50
ORD-009    A00001           0.75     10                 7.50

Sales for Customer: FIRST REALTY INC.              is:             20.00
                                                                -----------

Customer:  THIRD-FLOOR DESIGN INC           Number:  000003
---------                                   -------

Order No.  Product No.     Price   Quantity    Total for Order
---------  -----------     -----   --------    ---------------
ORD-003    A00010           1.85     10                18.50
ORD-007    A00006          25.00     11               275.00

Sales for Customer: THIRD-FLOOR DESIGN INC         is:            293.50
                                                                -----------

Customer:  SIX-GUN SALOONS INC              Number:  000006
---------                                   -------

******************** NO ORDERS FOR THIS CUSTOMER ********************

    Total Sales for Sales Area:  WESTERN           is:            313.50
    ---------------------------                    ---  ===============
```

```
    Page:   2          Customer Details Report: 2          Date:  04/20/92
    -----              --------------------------          -----

                                                           ===============
                Total Sales for All Sales Areas is:             1547.60
                -----------------------------------        ===============
```

LESSON 3: Quiz 4

Please answer the following questions. The solutions to these questions are supplied in Appendix A.

1. Can you supply a password for the report execution file?

2. If an item projected from a table equals NO_VALUE, what does that indicate about the relational operation on that table?

3. Can you use the final access table from another report? If so, how do you specify using another report's access?

5

LESSON 4: Considering Performance

This lesson revises the topics learned in the first three lessons, and introduces some new topics.

Before You Begin

Be sure your last report satisfied all the requirements for the previous lessons. The exercises in this lesson are built on information from the previous reports.

The Tasks

In this lesson you will enhance the report to provide a report that restricts information on the total sales in all areas to the board of directors only. Area sales managers must have a separate report that includes only those **details** that affect one sales area, not the data for all areas. But there must also be a report for the board of directors that prints details for all areas.

Also, the report must be able to select either all customers or a subset of customers on which to report.

Finally, you will add dollar signs to the values so that they are easier to read.

This report will use more than two **source tables** in a table, access a subset of data, restrict data using **parameters** and **selection sets**, print a report **heading** and suppress the page heading, and use edit masks to print dollar signs and commas in numeric items. You will learn about BRW performance, selection sets and parameters.

Performance

Part of this exercise deals with tuning report performance using keyed access to **HP TurboIMAGE/iX** data sets.

Even if you are not familiar with **databases** and **KSAM files**, you can use BRW to complete this lesson and generate some statistics that compare the speed of execution of the report with the speed of a COBOL program running a similar report.

What You Will Learn

Exercise	Description
Adding and Describing the 3rd Report	*10 minutes*
Defining the Data Access	How to use many source tables in a table, and how to use more than one **relation** in a table. Introduction to keyed access and BRW's access sequence. How to specify keyed access and access sequence on the Tune Access screen. *60 minutes*
Understanding Keyed Access	How to use keyed access. *15 minutes*
Defining the Selection Sets	How to define parameters, and the types of parameter you can define. The operator SATISFIES. How to define selection sets. Selection conditions. *40 minutes*
Defining Sorts and Breaks	How to use the parameters and the standard item SELECTION-SET in a **condition**. *20 minutes*
Defining Linesets	How to define a report heading. How to use the standard items USER, TIME, REPORT-DESCRIPT, and REQUEST-DATA*n*. How to print single-value parameters in a report. How to print parameters and their run-time values. How to alter edit masks and specify prefixes for an item. How edit masks affect the length of an item. *40 minutes*
Reviewing the Layout	How to see, online, how your report will look when it is printed. *5 minutes*
Compiling the Report	How to compile a report with various selection sets. *10 minutes*
Requesting the Report	How to enter values for parameters. The use of required parameters. *10 minutes*
Report Performance	How to read the compile listing and the execution statistics. How BRW accesses tables. Access blocks. The use of keyed access. How to improve report performance. *30 Minutes*
Total Time:	*4 hours*

The Report Data

The data is the same as the data for the previous report. That is, you will use the contents of the TOYDB data sets CUSTOMERS, ORDERS, ORDER-DETAILS, and PRODUCTS. The plan of the database TOYDB is shown in the figure of the TOYDB database in Chapter 1.

All the data in TOYDB is described in the dictionary file, BRWDIC.PUB.

Sketch the Report

The structure of this report is similar to that of the second report, except that you need a report heading to introduce the report and tell users what data they have selected.

The report is printed in ascending sales area order. Within each sales area the report is printed in ascending customer number order. Within each customer number the detail lines is printed in ascending order number order. The report can use the standard printer paper, paper length, and page width.

The calculations required for this report are:

- total sales in each sales area
- total sales in all sales areas
- total value of each order

These have all been defined in the second report.

Here is a rough sketch of this report:

ROUGH LAYOUT OF THE REPORT HEADING LINESET (INTRODUCES THE REPORT)

Report: Customer Details Report: #3 Date: 02/07/87

Report Requested by: USER at: 12:45

This report prints order details for selected customers in all Sales Areas in June, followed by the total sales for all Sales Areas in June.

The customer(s) selected for the report will depend on the value(s) you gave for the parameter(s) shown below. Note: if CUSTOMER-NO is blank, all customers will be selected.

Parameter	Value (if any)
CUSTOMER-NO	> "000005"

} New page after report heading

ROUGH LAYOUT OF THE REPORT — LINESET NOTES

Page: 1 June Customer Details Report: 2 Date: 02/07/87 } Heading for each new page

Customer Details for Sales Area: EASTERN } Heading for each new Sales Area

Customer: A Company Inc Number: 01 } Heading for each new Customer

Order No Product No Price Quantity Total for Order

ORD-001 A00001 10.00 500.00 $5,000.00 } Detail Lines. 1 per Order sorted in ascending order number order.

(other orders, or:)

*******NO ORDERS FOR THIS CUSTOMER******* } Note special line if no orders

Sales for Customer: A Company Inc is: $5,000.00 } Footing after each old Customer

(other customers)

Total Sales for Sales Area: EASTERN $7,500.00 } Footing after each old Sales-area

Page: 2 June Customer Details Report: 2 Date: 02/07/87 } Heading for the new Sales Area

(Other Sales Areas - Each One on a New Page)

Total Sales for All Sales Areas: $123,456.00 } Footing at end of the report (also on a new page)

The Linesets for This Report

This report has eight linesets, as described below.

1. The Report Heading lineset. This lineset prints the report title, the user who requested the report, the time and date on which it was run, a description of the report (whether for one or all sales areas), and the parameters and values selected.
2. The Page Heading lineset. This lineset prints the page number and date on the top of every page except the report heading.
3. The Level 1 Break Heading lineset, that is, the lineset that is printed before each new sales area when the sort item SALES-AREA changes. This lineset prints the sales area name.
4. The Level 2 Break Heading lineset, that is, the lineset that is printed to introduce each new customer when the item CUSTOMER-NO changes. This lineset prints the customer number, customer name, and the headings for the detail lineset. If a customer has no orders, a message is printed to emphasize this.
5. The Detail lineset, that is, each **record** in the report. In this report it will include each order number, product number, price of the product, quantity ordered, and the total value of the order. This lineset is suppressed if a customer has no orders.
6. The Level 2 Break Footing lineset, that is, the lines that are printed after the details of the last order for the old customer, when the item CUSTOMER-NO changes. In this case prints the total sales for the customer in the month. This lineset is suppressed if a customer has no orders.
7. The Level 1 Break Footing lineset, that is, the lines that are printed after the details for the last customer in the old sales area, when the item SALES-AREA changes. This prints the total monthly turnover for all the *selected* customers in the sales area. Note that if a subset of customers is selected, this lineset prints only the total monthly turnover for the customers in the subset.
8. The Report Footing lineset, that is, the total turnover for all *selected* customers in all sales areas, printed at the end of the report. Note that this lineset is not printed if only one sales area is selected, that is, if the report is run by a sales manager.

Exercise 1: Adding and Describing the Third Report

If you have left BRW since the last lesson, restart BRW and begin at the Select Report screen. *This exercise will take about 5 minutes*

Add the report

1. Type `CUSTREP3` in the Report field.
2. Choose `Add Report`. BRW displays the following prompt:

```
Copy from report                                    or press ENTER
  Add      Delete    List     other   24    18 Compile  Request    Help    Cancel
 Report   Report    Report     keys                Report  Report
```

3. Type `CUSTREP2` in the Copy from report field.
4. Press (Enter) or choose `Add Report`.

   BRW then displays the password prompt as below:

```
Password:
  Add      Delete    List     other   24    11 Compile  Request    Help    Cancel
 Report   Report    Report     keys                Report  Report
```

5. Type the password, `PASS2`, for CUSTREP2.
6. Press (Enter).

   BRW copies report CUSTREP3 from your old report, CUSTREP2, and displays the Define Report screen, as below.

```
HP ALLBASE/BRW                  Define Report                 Report: CUSTREP3

 Report Specification Password   PASS3

 Report Description    Customer Details Report: Tutorial Lesson 3
 Report Width          132         Number of Horizontal Pages  1
 Page Length           60
 Special Paper
 String Sorting Sequence          A  ( A = ASCII, E = EBCDIC, N = National )
 SQL Transaction Isolation Level     ( RU=Read Uncommitted,RC=Read Committed,
                                       CS=Cursor Stability,RR=Repeatable Read )
 USE Access of Report
 Final Access Table    CUSTREP2-DATA

Define   Define   Define   other     4* 35   Define   Output    Help    Exit
Table    Lines    Breaks    keys       n     Select'n  File
```

BRW displays the message "Report copied" at the bottom of the screen to tell you that the report CUSTREP2 has been copied successfully.

Add a Password and Report Description

1. Type a password, `PASS3`, in the Report Specification Password field
2. Type the description `Customer Details Report: Tutorial Lesson 4` in the Report Description field.

   As in the previous report, you will use the standard paper type, length, and width as well as the standard character set for string sorting. Therefore, do not change these fields.
3. Press Enter.

BRW displays the message "Report modified" to tell you that the changes were made.

Exercise 2: Defining the Data Access

This exercise describes how to use more than two source tables in a report and how to use more than one relation in a table. This exercise also introduces keyed access and access sequence and shows you how to use the Tune Access screen to specify keyed access and access sequence. *This exercise takes 60 minutes.*

You defined the data access in the previous report. In this report you must use keyed access to the HP TurboIMAGE/iX data sets to enhance the report performance.

Using More Than Two Source Tables

You built a series of two tables in the previous report. You require three tables in this lesson:

ORDER-TABLE	which joins ORDERS and ORDER-DETAILS on ORDER-NO
ORDER-PRODUCTS	which joins PRODUCTS with ORDER-TABLE on PRODUCT-NO
CUSTREP3-DATA	the **final access table**, which joins ORDER-PRODUCTS and CUSTOMERS on CUSTOMER-NO

There is an **open join** on ORDER-PRODUCTS, so that customers without orders will be included in the final access table.

Note

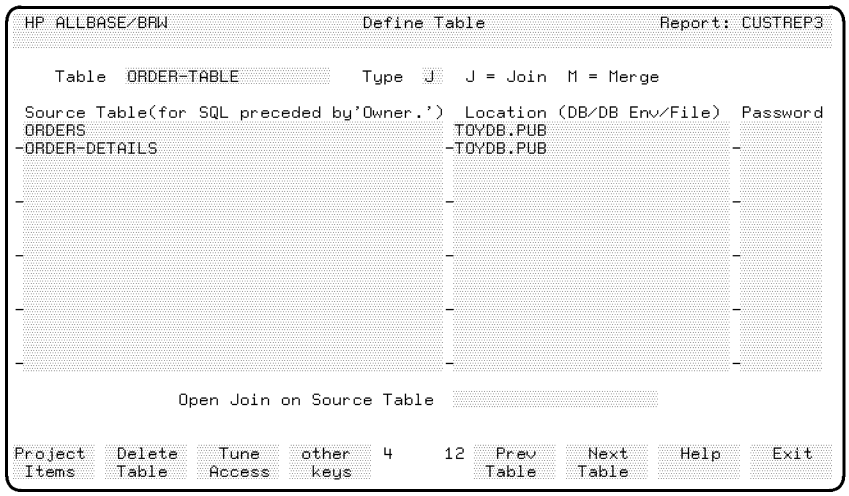
You can define the operations performed in the first two tables (ORDER-PRODUCTS and ORDER-TABLE) in one table, without loss of performance.

Add the first table

1. Choose `Define Table` to go to the Define Table screen.

```
HP ALLBASE/BRW                    Define Table                    Report: CUSTREP3

   Table  CUSTREP2-DATA          Type  J   J = Join  M = Merge

 Source Table(for SQL preceded by'Owner.')  Location (DB/DB Env/File)  Password
 CUSTOMERS                                  TOYDB.PUB
-ORDER-PRODUCTS                            -                          -
-                                          -                          -
-                                          -                          -
-                                          -                          -
-                                          -                          -

                Open Join on Source Table  ORDER-PRODUCTS

  Add     Define  Relation  other   4     12  Table    Define    Help     Exit
  Table   Relation Condit'n  keys              Calcitem  Lines
```

2. Type `CUSTREP3-DATA` in the Table field, overwriting CUSTREP2-DATA.
3. Press (Enter).
4. When BRW prompts "Press ENTER to confirm renaming the table", press (Enter) again to rename the table CUSTREP3-DATA.
5. Choose `Next Table` until the table ORDER-TABLE is displayed, as shown in the next table.



6. Choose `Delete Table`.
7. When BRW prompts "Confirm deletion of table ORDER-TABLE" press (Enter) or the `Delete Table` again to delete it.

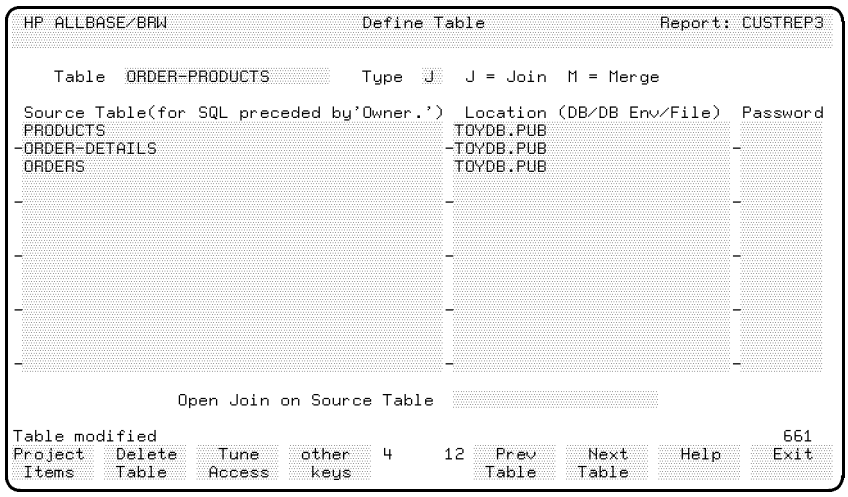
   BRW deletes the table and displays the previous table, ORDER-PRODUCTS.

Add the next table

1. Use the (Tab) key to move the cursor to the Source Table field below PRODUCTS.
2. Type `ORDER-DETAILS` in the Source Table field.
3. Type `TOYDB.PUB` in the Location field.
4. Type `ORDERS` in the next Source Table field.
5. Type `TOYDB.PUB` in the adjacent Location field.
6. Press (Enter).

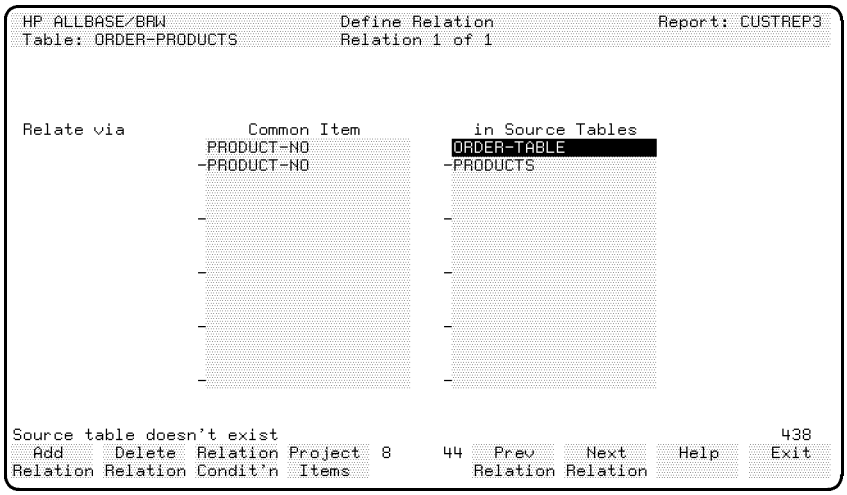
BRW modifies the table.

Your screen should look like this:



Define the relation between the tables

1. Choose `Define Relation`. The relation from the old table is shown in the next table.



   Note that the source table ORDER-TABLE is highlighted, and that BRW prompts "Source table doesn't exist". This is because you have deleted it. You need to replace it with the correct source table for PRODUCT-NO.

2. Type `ORDER-DETAILS` (overwriting ORDER-TABLE).
3. Press Enter.

BRW modifies the relation.

The screen now looks like this:

```
HP ALLBASE/BRW                Define Relation                Report: CUSTREP3
Table: ORDER-PRODUCTS         Relation 1 of 1

Relate via          Common Item          in Source Tables
                    PRODUCT-NO           ORDER-DETAILS
                   -PRODUCT-NO           -PRODUCTS
                    -                    -
                    -                    -
                    -                    -
                    -                    -

Relation modified                                                       432
  Add     Delete  Relation Project  8     20   Prev     Next     Help    Exit
Relation Relation Condit'n  Items          Relation Relation
```

Using More Than Two Relations

Now you must add a new relation between the data sets ORDERS and ORDER-DETAILS.

Add the relation between ORDERS and ORDER-DETAILS

1. Type `ORDER-NO` in the Common Item field, (overwriting `PRODUCT-NO`).
2. Press (Clear Display) or space over all the remaining text for the common items and source tables.
3. Choose `Add Relation`. (DO NOT press (Enter) because that would overwrite the previous relation.)

   BRW adds the two source tables and the relation automatically. The relation is now Relation 2 of 2, as shown in the next table.

```
HP ALLBASE/BRW                Define Relation                Report: CUSTREP3
Table: ORDER-PRODUCTS         Relation 2 of 2

Relate via          Common Item          in Source Tables
                    ORDER-NO             ORDER-DETAILS
                   -ORDER-NO             -ORDERS
                    -                    -
                    -                    -
                    -                    -
                    -                    -

Relation added                                                          433
  Add     Delete  Relation Project  8     20   Prev     Next     Help    Exit
Relation Relation Condit'n  Items          Relation Relation
```

Note

If the item ORDER-NO had been in all three source tables, BRW would have added a further Common Item, ORDER-NO of PRODUCTS, to this relation.

4. Choose `Relation Condit'n`.

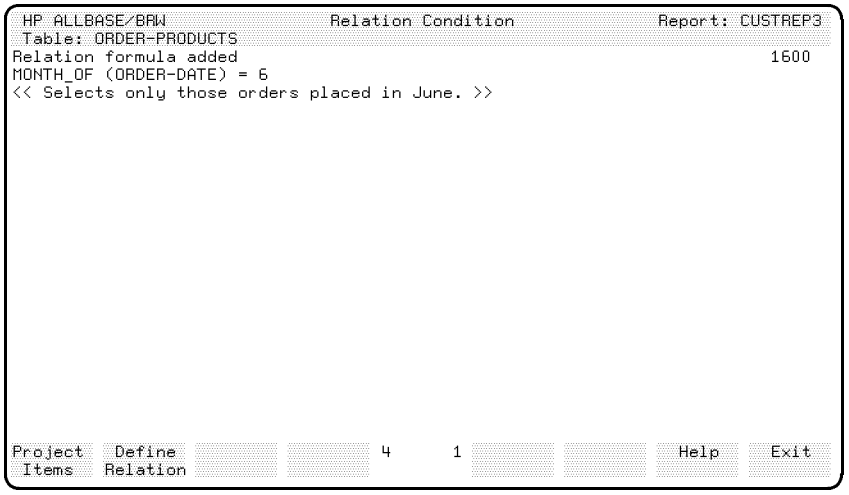
   BRW displays the Define Relation Condition screen.

5. Type the following text:

```
MONTH_OF (ORDER-DATE) = 6
<< Selects only those orders placed in June. >>
```

6. Press Enter.

   BRW adds the relation formula.



7. Choose `Exit` to return to the Define Table screen for table ORDER-PRODUCTS.

You have incorporated the old table ORDER-TABLE in ORDER-PRODUCTS.

Note

There are no performance gains or losses in this operation. The object was to demonstrate that more than two source tables can be used in a table definition, with more than one relation in each table. BRW will work out the most efficient way of relating the tables when the report is run.

Exercise 3: Understanding Keyed Access

One of your tasks for this lesson requires that your reports use keyed access and that you demonstrate the performance improvements of keyed as against serial access. The performance improvements will only be apparent once the report is run. Therefore, this comparison, and a detailed examination of access tuning and methods, are discussed at the end of Lesson 4, when you run the report. *This exercise takes about 15 minutes.*

The first part of this exercise is a reading exercise. Read the following paragraphs for an understanding of keyed access versus default access.

Default Access

By default, BRW reads each source table serially, in the order specified on the Define Table screen. BRW reads each table serially into a workfile. It then sorts the workfile, using the **common item** defined in the relation as the sort key. For example, the Define Table screen for ORDER-PRODUCTS lists the tables in the order PRODUCTS, ORDER-DETAILS, and ORDERS. BRW reads the PRODUCTS data set into a workfile. This file is sorted on PRODUCT-NO. It then reads the data set ORDER-DETAILS into a second workfile, and sorts it on PRODUCT-NO. Then it joins the two workfiles, on PRODUCT-NO, and writes the resulting records into a third workfile.

Tuned Access

You can, however, specify both the order in which the data sets are read, and the method of access. For example, you know that you want to read all the records in ORDERS, so that you can determine which orders were for June. It is better to read this data set serially, because you want to read all the records in it.

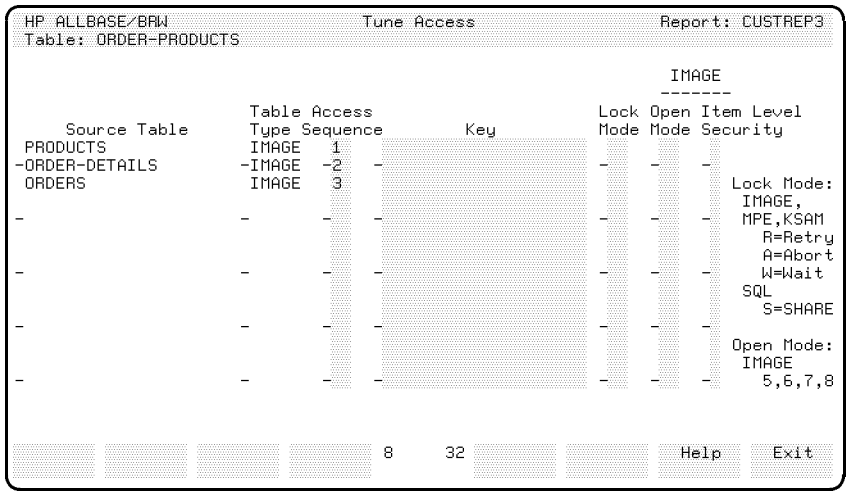
But note data set ORDER-DETAILS. You only want to access the items in this data set that match the ORDER-NO in ORDERS. So you can use keyed access to ORDER-DETAILS, on the item ORDER-NO. That is, when you have found the values of ORDER-NO in ORDERS that apply to June, you can use those values as keys into the data set ORDER-DETAILS. In this way, you do not have to read ORDER-DETAILS into a workfile and sort it. Using keyed access, you know that you will directly retrieve the records that you want.

The same is true of data set PRODUCTS. You only want information on those products that have been ordered in June, that is, that are present in the table ORDER-PRODUCTS. So, if you use keyed access on PRODUCT-NO, using the values of PRODUCT-NO found in ORDER-DETAILS, you will automatically have the records that you want without any sorting.

So, by altering the sequence in which the tables are accessed, and by using keyed access on PRODUCTS and ORDER-DETAILS, you can improve report performance. You tune the report's performance on the Tune Access screen.

Use Tuned Access

1. Choose `Tune Access` to display the Tune Access screen.



The three source tables are listed in the order in which they appear on the Define Table screen. The default access sequence (the order in which they will be read) is this order. But you want to read ORDERS first, followed by ORDER-DETAILS, and finally PRODUCTS.

2. Type `3` in the Access Sequence field beside PRODUCTS.
3. Leave the `2` in the Access Sequence field beside ORDER-DETAILS.
4. Type `1` in the Access Sequence field beside ORDERS.
5. Press Enter.

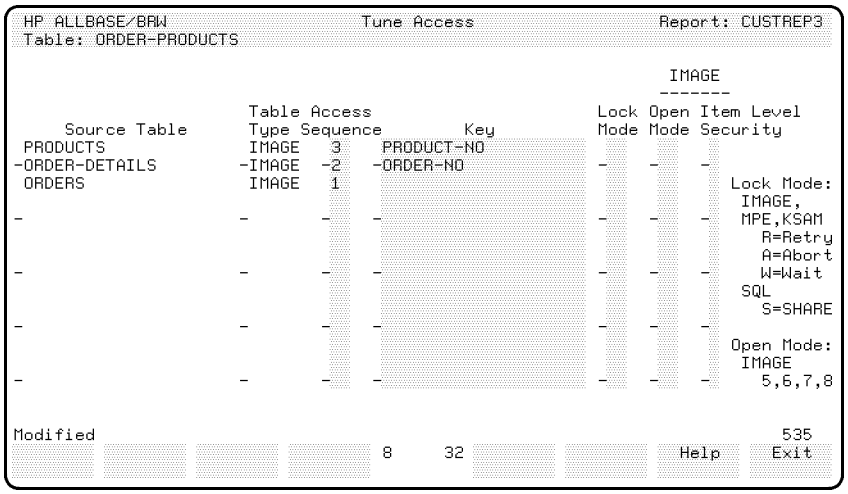
BRW tells you that the access sequence has been modified.

Specify Keyed Access

Now you want to specify keyed access on the source tables PRODUCTS and ORDER-DETAILS.

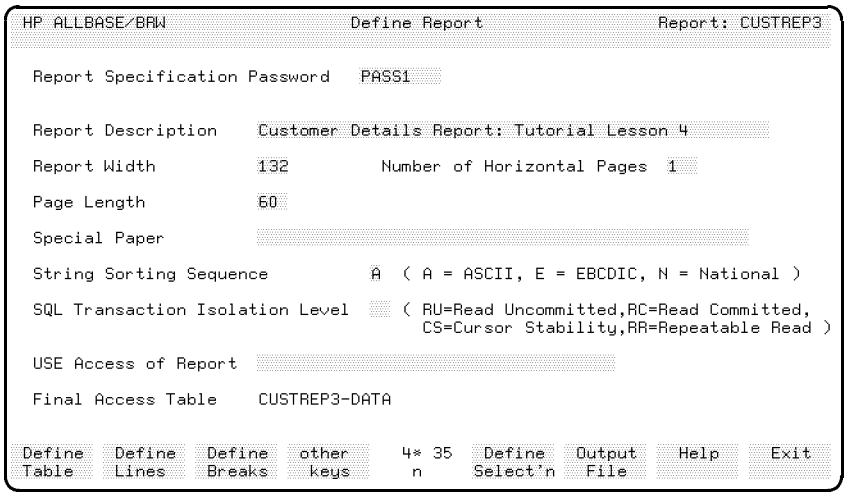
1. Type `PRODUCT-NO` in the Key field beside PRODUCTS,
2. Type `ORDER-NO` in the Key field beside ORDER-DETAILS.
3. Press Enter.

   BRW will use keyed access on the tables. If the source table is a master data set, a calculated read is used, if the source is a detail data set, a chained read is used, and if the source table is a KSAM file, keyed access to the KSAM file is used. BRW tells you immediately if you try to use keyed access on an item that is not a key.



BRW tells you that the access sequence has been modified.

4. Choose **Exit** twice to return to the Define Report screen.



Note that the new final access table is CUSTREP3-DATA.

LESSON 4: Quiz 1

Please answer the following questions. The solutions to these questions are supplied in Appendix A.

1. What is the maximum number of source tables that can be joined to form a table?

2. If you specify the source tables CUSTOMERS and INVOICES in that order on the Define tables screen, what will be the default access sequence?

3. Can you change the above access sequence?

4. What happens if you try to use an item for keyed access when that item is not a key item in the data set?

5. "You can have no more than one **relation condition** *per relation* in a joined table." True or False?

6. Apart from Access Sequence and Key, what other fields are available on the Tune Access screen?

Exercise 4: Defining the Selection Sets

This exercise shows you how to define parameters, and describes the three types of **parameters**. This exercise also describes the operator SATISFIES, shows you how to define **selection sets**, and **selection conditions**. *This exercise takes 40 minutes.*

Overview

You need to restrict the report so that:

- sales managers can only obtain information concerning one sales area
- You can select the customers to be included in the report at run time.

You can restrict data using selection sets, and provide a means of selecting a subset of data at run time using parameters.

What is a Parameter?

A parameter is a placeholder for which you provide a value at run time. Whenever you run a report containing a parameter, you can supply a value for that parameter.

Parameters must be preceded by a question mark when used in report calculations or on the Define Lines screen. Parameters are fully described in the *HP ALLBASE/BRW Reference Manual*.

This lesson gives you an example exercise for using parameters.

What is a Selection Set?

A selection set is a set of default information that can be used every time you run the report. Such default information includes: parameter values, number of copies, print device, input and output priorities, and so on. A report can have multiple selection sets so it can be tailored for many users by **compiling** the report with different selection sets.

Each combination of selection set and report is compiled to form a separate **execution file**. In this way, one report can be tailored for many different users by compiling it with different selection sets.

A selection set can have a selection condition that acts as a filter for data used in the report.

This lesson has an exercise that shows you how selection sets and selection conditions are used.

Selection Conditions and Relation Conditions

You could specify a condition as a relation condition instead of a selection condition. However, a selection condition applies only to reports compiled with a particular selection set. A relation condition applies to all compilations of the report, regardless of the selection set, or even if no selection set is used.

Your Task

You want two reports, one for directors that allows access to all sales areas, and one for sales managers, which is restricted to one sales area only. Additionally, you want to be able to choose either all customers or a subset of customers.

You can use parameters to select a subset of customers and a sales area, and use two selection sets to provide two execution files, one for directors, and one for sales managers.

Define the selection set for directors

1. Choose `Define Select'n`.

   BRW displays the Define Selection screen.

```
 HP ALLBASE/BRW                  Define Selection                Report: CUSTREP3

Selection Set                                                freeze screen field: *
                                                                value required: R
     Parameter     Type                       Default Values




                       value separator: ,   masks: @?    date format: dd/mm/yy
--------------------------------------------------------------------------------
No. of Copies   1         Print Device
Output Priority 8         Print File Name
CCTL/NOCCTL               Environment File

Job Input Priority  8           Scheduled
--------------------------------------------------------------------------------
No selection sets defined                                                  1730
  Add    Select'n Define   other   4     17  Prev      Next      Help      Exit
Select'n Condit'n Parms     keys             Values    Values
```

Note

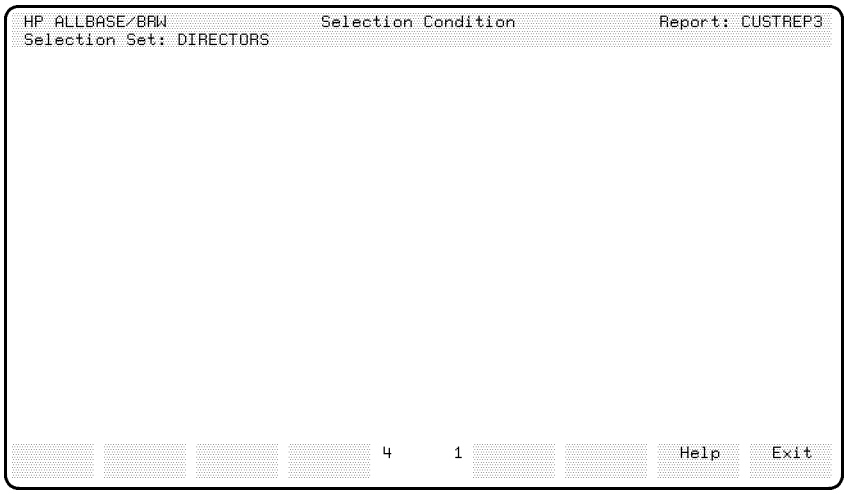
This screen look likes the Request Report screen. The selection set for directors uses a parameter to select either all customers or a subset of customers in the report.

2. Type `DIRECTORS` in the Selection Set field.
3. Press `Add Select'n`.

   BRW tells you the selection set was added.

Define the selection of customers

1. Choose `Select'n Condit'n` to define a selection condition that will select a subset of customers.



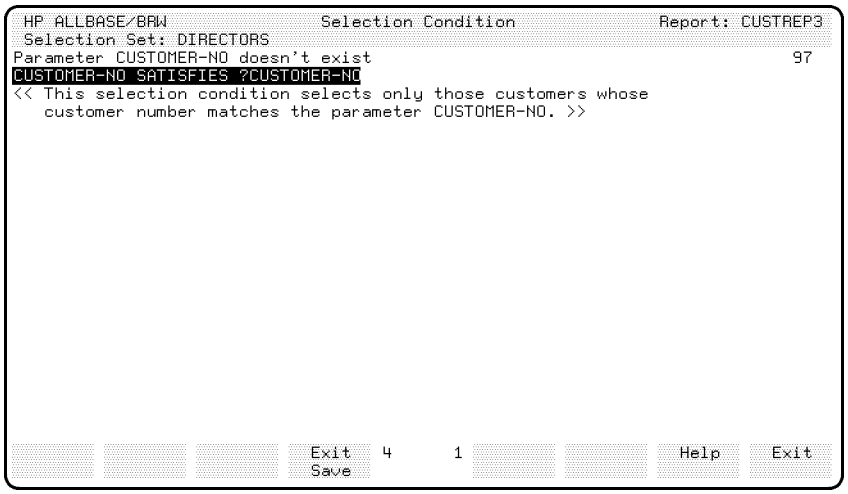
This is the Selection Condition screen. You want a condition that will select only those customers that are requested by the user at run time, that is, only those customers specified in a parameter.

2. Type the following text:

```
CUSTOMER-NO SATISFIES ?CUSTOMER-NO
<< This selection condition selects only those customers whose
   customer number matches the parameter CUSTOMER-NO. >>
```

3. Press Enter.

   The prompt tells you that the parameter CUSTOMER-NO does not exist. A new function key, `Exit Save` is now available.



4. Choose `Exit/Save` to return to the Define Selection screen and save your selection condition.

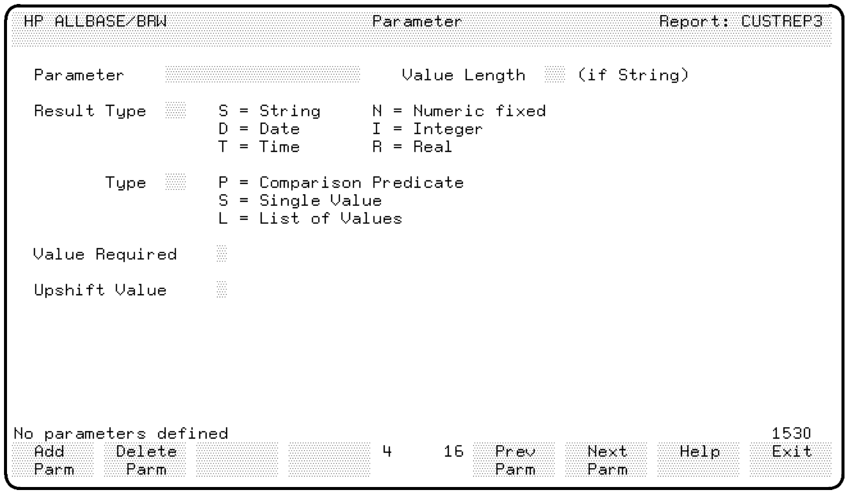
The `Exit Save` key lets you leave an incomplete formula and correct it later. (If you just choose `Exit` on an incomplete formula, the formula would be erased).

When you define the parameter, this formula will be correct.

Define a parameter

1. Choose `Define Parms` to define the parameters.

   BRW displays the Parameter screen.



2. Type `CUSTOMER-NO` in the Parameter field.
3. Type `6` for the Value Length.
4. Type `S` for the Result Type.

   Notice the other result types available. The parameter we use in this report is a string (S).
5. Type `P` for Type.

   CUSTOMER-NO is a comparison predicate parameter (P).

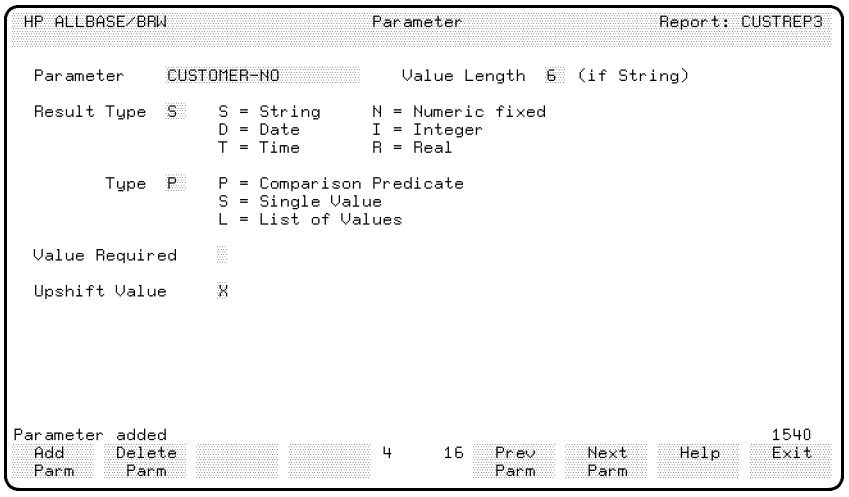
   There are three types of parameter:

Comparison Predicate	can be substituted by an operator and a value
Single Value	can be substituted by a single value only
List of Values	can be substituted by a list of values

   Comparison predicate parameters are used in formulas only with the operator SATISFIES, as in the selection condition you just defined. Operators for comparison predicates are fully described in the *HP ALLBASE/BRW Reference Manual*.
6. Type `X` in the Upshift field.

At run time the parameter will be converted to uppercase.

7. Choose `Add Parm`.



BRW adds the parameter.

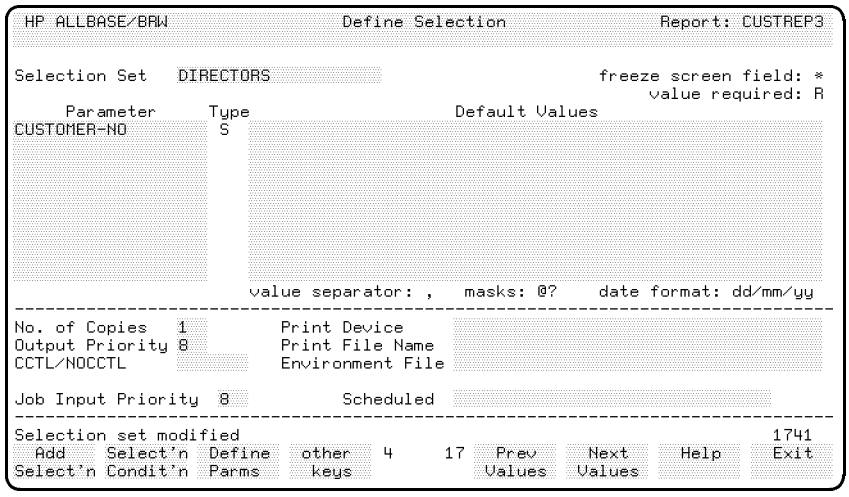
Note

A parameter and an item can have the same name; you differentiate between them in formulas and in the **report layout** by specifying a ? before the parameter name.

Finish defining the CUSTOMER-NO parameter

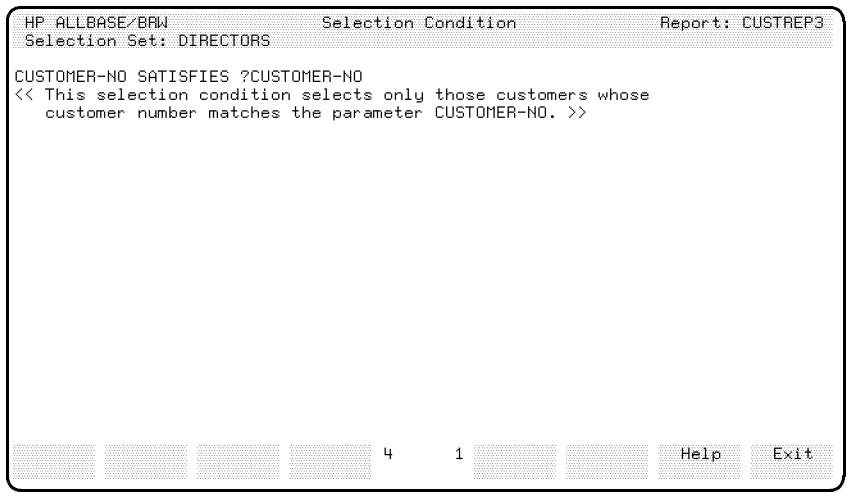
1. Choose `Exit` to return to the Define Selection screen.
2. Type `CUSTOMER-NO` (without a preceding "?") in the Parameter field.
3. Press Enter.

   Now, if the report is run when compiled with this selection set, the parameter CUSTOMER-NO will be displayed on the Request Report screen so the user will know that they can supply a value for the parameter. (If no parameter value is entered, the condition will be ignored and all records will be selected.)



4. Choose `Select'n Condit'n`.

   The Selection Condition screen appears.



   Because you have defined the parameter CUSTOMER-NO, the formula is now correct. No error is indicated and the `Exit Save` key is not displayed.

5. Choose `Exit` to return to the Define Selection screen.

You have now defined the selection set for directors. A director running this report, when compiled with selection set DIRECTORS, can select a subset of, or all of, the customers.

Defining the Selection Set for Sales Managers

The selection set for sales managers is much the same as that for directors, except that sales managers must only be allowed to report data on one sales area. So you need one more parameter that selects one, and only one, sales area.

Define the selection set

1. Choose `Define Parms`.

   BRW displays the screen for parameter CUSTOMER-NO. The parameter that selects one, and only one, area must be a single value parameter.

2. Type `AREA` in the Parameter field.

3. Space over the remainder of CUSTOMER-NO

4. Type `16` in the Value Length field.

5. Type `S` in the Result Type field.

6. Type `S` in the Type field.

   This is a single value parameter since you want to select one, and only one sales area for the report.

7. Type `X` in the Value Required field. When the report is compiled with this selection set, BRW will require a value for this parameter.

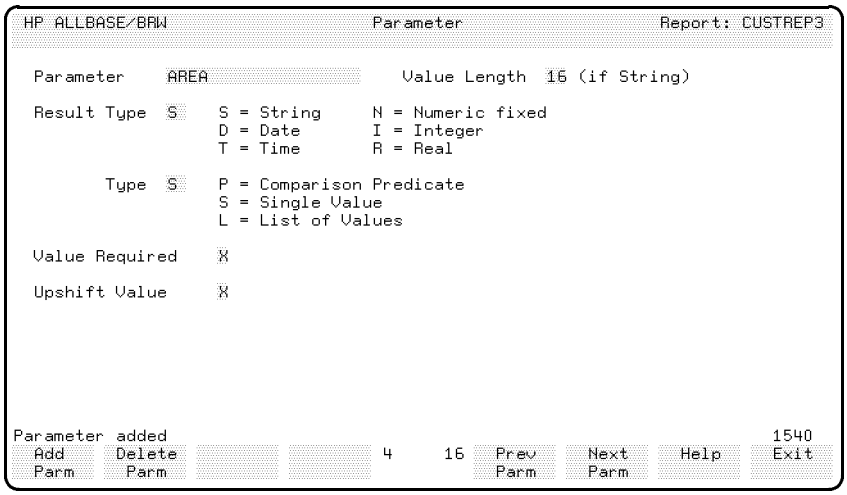
8. Type `X` in the Upshift Value field

   The value will be converted to all uppercase.

9. Choose `Add Parm`. (Do not press Enter, as then BRW will assume you want to rename the old parameter.)

   BRW adds the new parameter.

   Your screen should look like the next example:

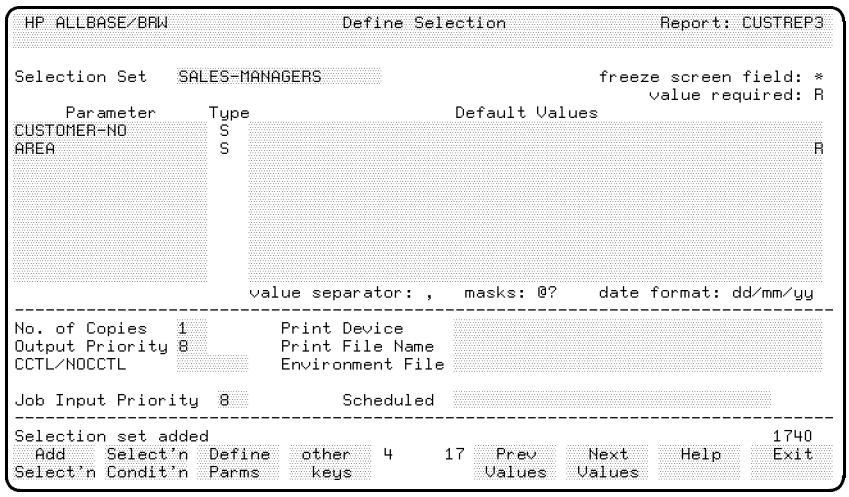


10. Choose `Exit` to return to the Define Selection screen.

Define the selection set for sales managers

1. Type `SALES-MANAGERS` in the Selection Set field.
2. Type `AREA` in the parameter field below CUSTOMER-NO.
3. Choose `Add Select'n`.

   BRW tells you the selection was added.



Define the selection condition for the selection set

1. Choose `Select'n Condit'n`.
2. Type the following text:

```
(SALES-AREA = ?AREA) AND (CUSTOMER-NO SATISFIES ?CUSTOMER-NO)
<< This selection condition selects a subset of customers in
   one, and only one, sales area. >>
```

3. Press Enter.

Your screen should look like the following example:

```
 HP ALLBASE/BRW               Selection Condition              Report: CUSTREP3
 Selection Set: SALES-MANAGERS
Selection condition added                                                   1766
(SALES-AREA = ?AREA) AND (CUSTOMER-NO SATISFIES ?CUSTOMER-NO)
<< This selection condition selects a subset of customers in
   one, and only one, sales area. >>





                                    4      1                   Help      Exit
```

When the report is compiled with selection set SALES-MANAGERS, only those records that are in the sales area specified, and that satisfy the comparison predicate parameter CUSTOMER-NO, will be used in the report.

4. Choose `Exit` to return to the Define Selection screen.

```
 HP ALLBASE/BRW                  Define Selection               Report: CUSTREP3

Selection Set   SALES-MANAGERS                             freeze screen field: *
                                                               value required: R
     Parameter      Type                    Default Values
CUSTOMER-NO           S
AREA                  S                                                        R



                        value separator: ,    masks: @?    date format: dd/mm/yy
-------------------------------------------------------------------------------
No. of Copies   1          Print Device
Output Priority 8          Print File Name
CCTL/NOCCTL                Environment File

Job Input Priority  8           Scheduled
-------------------------------------------------------------------------------
  Add    Select'n  Define   other   4     17   Prev     Next     Help      Exit
Select'n Condit'n  Parms     keys              Values   Values
```

Anyone running the report, when compiled with selection set SALES-MANAGERS, must enter a value for the required parameter AREA. This parameter is used in the selection condition that restricts records in the report to those records with the same sales area.

5. Choose `Exit` again to return to the Define Report screen.

Note

There is no restriction on which sales area is reported. If you wanted to restrict the report to one sales area you can define a further selection set, with the following selection condition:

```
(SALES-AREA = "EASTERN") AND (CUSTOMER-NO SATISFIES ?CUSTOMER-NO)
```

You could define four such selection sets, each with a selection condition restricting the sales area to one of the four areas. In that case, you would not need the parameter AREA.

However, other exercises in this lesson assume you are using the parameter AREA.

LESSON 4: Quiz 2

Please answer the following questions. The solutions to these questions are supplied in Appendix A.

1. How many selection sets and parameters can you have in a report?

2. What is the difference between the *parameter result* (or *data*) *type* and the *type of parameter*?

3. "The main difference between a relation condition and a selection condition is that the relation condition is evaluated earlier and so is more efficient." True or False?

4. "Unless you include a parameter in a selection set and compile the report with that selection set, you cannot give a value for that parameter at run time." True or False?

5. "You can use any operator with a comparison predicate parameter." True or False?

Exercise 5: Defining the Sort and Breaks

This exercise describes how to use parameters, how to use the standard item SELECTION-SET in a condition, and how to suppress the page heading. *This exercise takes 20 minutes.*

You can use the **sorts** and **breaks** that you defined for the previous report in this report. However, you do not want to print the report footing lineset when the report is compiled with selection set SALES-MANAGERS.

The Report Footing prints the total for all selected customers in all sales areas, and it is a security requirement that sales managers do not have access to this information. Also, reports compiled with the selection set SALES-MANAGERS can only access records from one sales area, so the report footing would be misleading.

Define a new sort and break

1. Choose `Define Breaks`.

   BRW displays the Define Breaks & Pagination screen.

```
 HP ALLBASE/BRW           Define Breaks & Pagination          Report: CUSTREP3

       S o r t   &   B r e a k        |          P a g i n a t i o n
                                      |
                                      |                      Page Length  60
                          Sort   Change |      Reset Page Number on Level  1
                          Level  Degree |
    Sort and Break         and    for   |  --- Heading ----    --- Footing ----
      on Item       Type  Order  Break  |  Lines Paging Abs    Lines Paging Abs
 ( Detail Lines )          D            |  1
 ( Page Break   )          P            |  3           1       0
 ( Report Break )          R            |  0                   5      B
-SALES-AREA          S    -1A     -     |  3      -    -       4      -    -
 CUSTOMER-NO         S     2A           |  7                   4
 ORDER-NO            S     3A           |  0                   0
-                         -       -     |         -    -              -    -
                                        |
                                        |
-                         -       -     |         -    -              -    -
                                        |
                                        |

 Define   Delete  Suppress  Output  6     77                     Help     Exit
 Lines   Lineset  Lineset    File
```

2. Choose `Suppress Lineset`.

   BRW prompts for the lineset level, as shown in the next figure.

```
Specify lineset level (D,P,R,1..9):   and type (H,F):
 Define   Delete  Suppress  Output  24    37                     Help    Cancel
 Lines   Lineset  Lineset    File
```

3. Type `R` in the lineset level field.
4. Type `F` in the (H,F) field.
5. Press (Enter).

   BRW displays the Suppress Lineset screen for the Report Footing.

When the selection set is SALES-MANAGERS, you want to suppress the total for all areas.

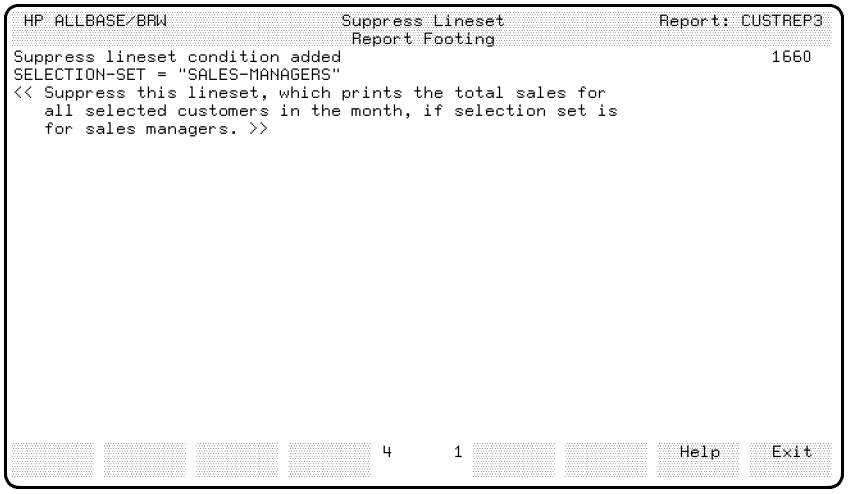
6. Type the following text:

```
SELECTION-SET = "SALES-MANAGERS"
<< Suppress this lineset, which prints the total sales for
   all selected customers in the month, if selection set is
   for sales managers. >>
```

Note

You must enter the value SALES-MANAGERS in uppercase letters, as shown. BRW is case sensitive when information appears inside double quotation marks (").

7. Press Enter.



BRW tells you the Suppress Lineset condition was added.

Now this lineset will be suppressed, that is, will not be printed, if the selection set with which the report was compiled is SALES-MANAGERS. Note the standard item SELECTION-SET used in the formula. You can use this item anywhere in a report layout or in layout (but not table) calculations. It holds the name of the selection set with which the report was compiled.

8. Choose Exit to return to the Define Breaks & Pagination screen.

Absolute Positioning of Linesets

For this report, you have a report heading that introduces the report and prints the page number and date. The report heading is printed at the top of the first page of the report. The page heading also prints the page number and date and is normally printed at the top of every page of the report. Because the report heading already prints this information on the first page, you do not need the page heading to print also.

You can set an absolute position for the report heading that will prevent the page heading from printing.

If you specify that a lineset is to be printed at an absolute position on the page, you will reserve the space on a page for that lineset. Then, whenever that lineset occurs it will start at the line you selected, and any subsequent linesets will be printed after the absolutely positioned lineset.

However, there is a special case with the page heading and footing. If you position a lineset absolutely on a line that is normally occupied by the page heading or footing, the page heading or footing is suppressed. So if you specify that the report heading lineset is printed on line 1, the page heading will be suppressed when the report heading is printed.

Suppress page heading and footing

1. Type `A` in the Paging field for the Report Break Heading.
2. Type `1` in the Abs field.
3. Press Enter.

```
HP ALLBASE/BRW          Define Breaks & Pagination          Report: CUSTREP3

       S o r t   &   B r e a k          |          P a g i n a t i o n
                                        |
                                        |                    Page Length  60
                              Sort  Change |      Reset Page Number on Level  1
                              Level Degree |
    Sort and Break                    and  for  |  --- Heading ----    --- Footing ----
       on Item          Type  Order  Break  |  Lines Paging Abs    Lines Paging Abs
 ( Detail Lines )             D             |   1
 ( Page Break   )             P             |   3          1        0
 ( Report Break )             R             |   0     A    1        5     B
-SALES-AREA              S   -1A    -       |   3     -    -        4     -    -
 CUSTOMER-NO             S    2A            |   7                   4
 ORDER-NO                S    3A            |   0                   0
-                            -     -       |         -    -             -    -
                                            |
                                            |
-                            -     -       |         -    -             -    -
                                            |
                                            |

Breaks and pagination modified                                          1117
 Define   Delete  Suppress  Output  6     77                    Help    Exit
 Lines    Lineset Lineset    File
```

BRW tells you that the Breaks and Pagination were modified. The A in the Paging field for the Report Headings will print a new page after the introductory report heading.

LESSON 4: Quiz 3

Please answer the following questions. The solutions to these questions are supplied in Appendix A.

1. Assuming a page length of 60, and that the break footing on CUSTOMER-NO has 5 lines, what would happen to the page footing lineset if you positioned the break footing for CUSTOMER-NO on line 56?

2. How can you reserve space for a lineset whether or not that lineset is printed?

3. What happens when you absolutely position the break footing for CUSTOMER-NO and the break footing for SALES-AREA on the same line?

Exercise 6: Define the Linesets

You define the linesets for the report in this exercise. You define a report heading and learn how to use standard items USER, TIME, REPORT-DESCRIPT, and REQUEST-DATA*n*; how to print single-value parameters in a report; how to print the parameters and their run-time values; how to alter edit masks; how to add prefixes to an item when printed; how to define a message to be printed in place of an item if that item is zero; and how edit masks affect the length of an item. *This exercise takes 40 minutes.*

Note

The step-by-step instructions in this exercise are less specific than some previous instructions. You are expected to use what you learned from previous exercises. If you need additional help, look at examples from previous exercises or use the Help screen in BRW.

Defining the Report Heading Lineset

You need a Report Heading to print an introduction to the report. This report heading will print the report name, date and time requested, the user who requested the report, whether the report reports customers from one or all sales areas, and the parameters and their values.

Define the report heading

1. Choose `Define Lines`.
2. Specify `R` and `H` (for Report and Heading) when BRW prompts for the lineset level.

   BRW displays the Define Lines screen for the Report Heading.

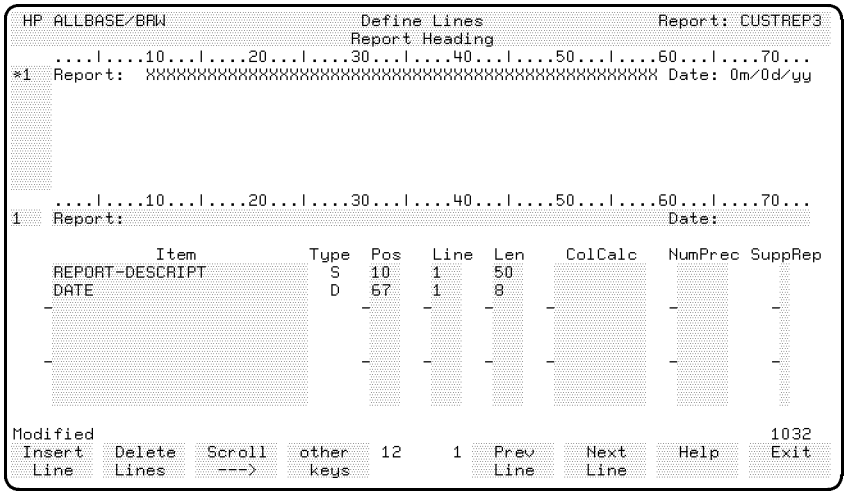
Add the REPORT-DESCRIPT standard item

1. Type `1` in the line number field.
2. In the line text field, type `Report:` at character position 1.
3. Type `Date:` at character position 61.
4. Add the two items `REPORT-DESCRIPT` and `DATE` in the Item field.

   Place them both on line 1, position them at character position 10 and 67 respectively.
5. Press Enter.

   BRW adds the line. REPORT-DESCRIPT is an BRW standard item, and its value is taken from the Report field on the Define Report screen.

Your screen should look like the next figure.

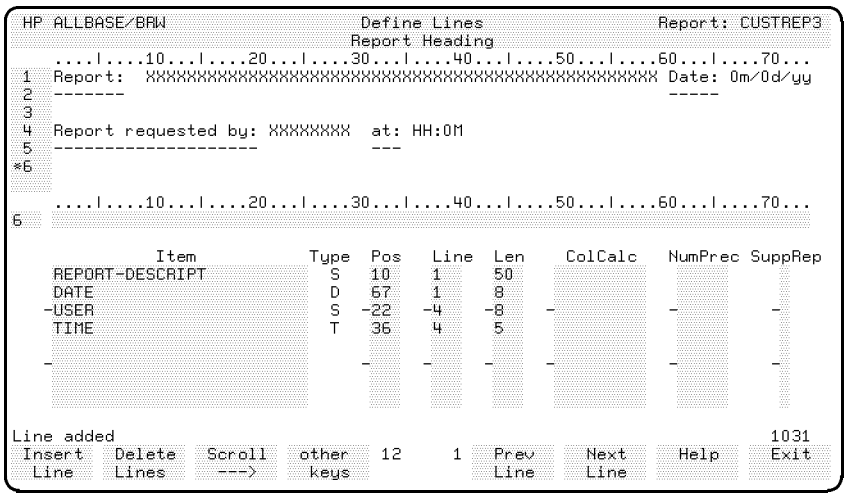


Add the USER and TIME standard items

1. Add underlining on line 2 for the text `Report:` and `Date:` on line 1.
2. Insert a blank line after line 2
3. Add line 4 to shows who requested the report, and at what time.

   In the new line, use the standard items USER and TIME. At run time, BRW uses the name of the user reqeusting the report and the time the report is run.
4. Underline the text in line 4.
5. Add an additional blank line.

Your screen should look like this next screen.



Add two report descriptions

You need one description for a report run by a director and a different description when the report is run by a sales manager.

1. Put this text on lines 7 and 8:

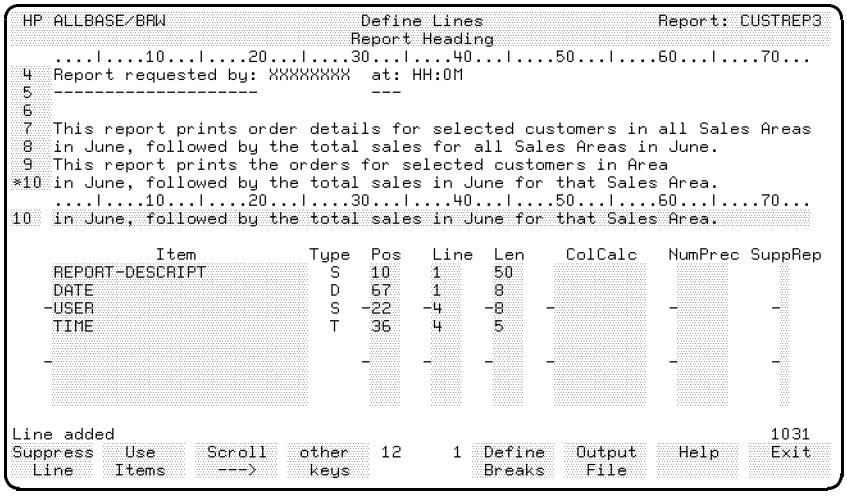
```
This report prints order details for selected customers in all Sales Areas
in June, followed by the total sales for all Areas in June.
```

2. Put this text on lines 9 and 10:

```
This report prints the orders for selected customers in Area
in June, followed by the total sales in June for that Sales Area.
```

   Don't worry that a word seems to be missing after the word `Area` in the first line. Later you will add the single-value parameter `?AREA` to the line so that the area selected at run time will print in that spot.

   The two lines should be as shown here:



3. Go to the suppress line screen and define suppress line conditions for lines 7 and 8 as follows:

   ```
   SELECTION-SET = "SALES-MANAGERS"
   ```

   (You must enter the value SALES-MANAGERS in uppercase letters.)

4. Define suppress line conditions for lines 9 and 10 as follows:

   ```
   SELECTION-SET = "DIRECTORS"
   ```

   (Remember, you must enter the value DIRECTORS in uppercase letters.)

Print Single-Value Parameters

1. Return to the Define Lines screen.
2. Type `?AREA` in the Item field.
3. Type `62` in the Pos. field and `9` in the Line field.

   At this position, the area selected at run time will print one space after the word `Area` on line 9. If this spacing is not correct, adjust the positioning of the text or reposition the parameter.
4. Press (Enter).

Print the report parameters and values

The final task on the Report Heading is to print the values for the parameters.

1. Add a blank line after line 10.
2. Add the three lines of text shown below:

```
Customers were selected for this report depending upon the values you
gave for the parameters shown below.  Note:  If CUSTOMER-NO is blank, all
customers are selected.
```

3. Add another blank line.
4. Type lines creating a heading for the Parameter and Value columns and underline the headings.

```
Parameter       Value (if any)
---------       --------------
```

5. Add a final blank line.

   Your screen should look like this:

```
HP ALLBASE/BRW                     Define Lines                    Report: CUSTREP3
                                  Report Heading
    ....|....10...|....20...|....30...|....40...|....50...|....60...|....70...
 12 Customers were selected for this report depending upon the values you
 13 gave for the parameters shown below.  Note: If CUSTOMER-NO is blank, all
 14 customers are selected.
 15
 16     Parameter       Value (if any)
 17     ---------       --------------
*18
    ....|....10...|....20...|....30...|....40...|....50...|....60...|....70...
18

              Item             Type  Pos   Line  Len    ColCalc    NumPrec SuppRep
    REPORT-DESCRIPT              S    10    1     50
    DATE                         D    67    1     8
   -USER                         S   -22   -4    -8   -           -        -
    TIME                         T    36    4     5
    ?AREA                        S    62    9     16
   -                                  -     -     -    -           -        -

Line added                                                                    1031
 Insert   Delete   Scroll   other   12     1   Prev     Next     Help     Exit
  Line    Lines     --->    keys               Line     Line
```

Adding the Standard Items for REQUEST-DATA*n*

You have now defined the heading for the parameters. You can print the parameters, and any values for them, using the standard items REQUEST-DATA*n*. REQUEST-DATA*n* prints any parameters and values specified on the Request Report screen. REQUEST-DATA1 would be the first value specified on the screen, REQUEST-DATA2 would be the second, and so on. You can specify up to 50 parameters. In this report, you have only used two parameters (CUSTOMER-NO and AREA) so you only need REQUEST-DATA1 and REQUEST-DATA2.

Add the standard items

1. Add the two items REQUEST-DATA1 and REQUEST-DATA2 on the next two lines, as shown below.

```
 HP ALLBASE/BRW                      Define Lines                    Report: CUSTREP3
                                     Report Heading
    ....!....10...!....20...!....30...!....40...!....50...!....60...!....70...
 14 customers are selected.
 15
 16     Parameter        Value (if any)
 17     ---------        --------------
*18
 19>    XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
 20>    XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
    ....!....10...!....20...!....30...!....40...!....50...!....60...!....70...
18

              Item            Type  Pos   Line  Len    ColCalc   NumPrec SuppRep
    REPORT-DESCRIPT             S    10    1     50
    DATE                        D    67    1     8
   -USER                        S   -22   -4    -8    -           -       -
    TIME                        T    36    4     5
    ?AREA                       S    62    9     16
   -REQUEST-DATA1               S   -5    -19   -80   -           -       -
    REQUEST-DATA2               S    5     20    80

Modified                                                                   1032
 Insert   Delete   Scroll   other   12     1   Prev     Next     Help     Exit
  Line     Lines    --->     keys              Line     Line
```

(If you want to see an example solution, look at the report SOLUTN3.BRWSPEC.ITF3000. (This solution is an example solution included with the tutorial in BRWEXEC.ITF3000. See Appendix B for more information about sample solutions.)

Your report heading will now print: the date, time, name of the person requesting the report, an introduction for either a director or sales manager showing what data will be reported, and the parameters and their values.

The Page Heading Lineset

The next lineset to alter is the page heading lineset.

1. Choose `Select Lineset`.
2. Specify `P`(age) `H`(eading) when BRW prompts for the lineset level.
3. Press Enter.

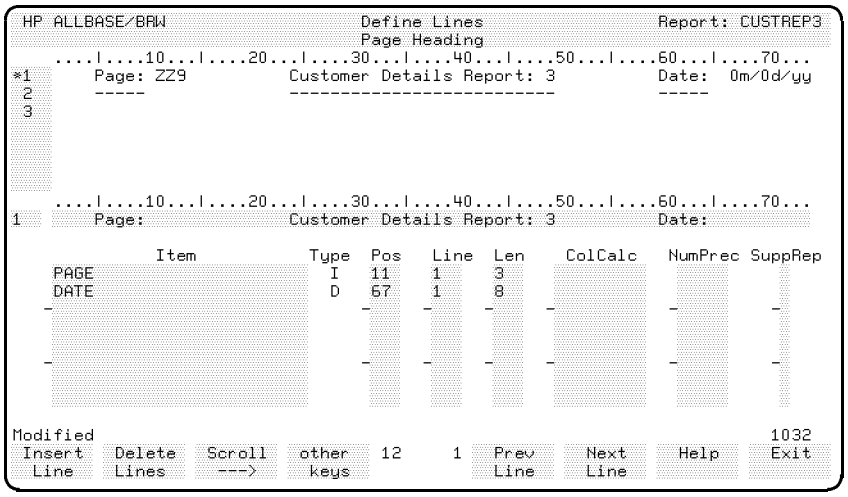
   BRW displays the Define Lines screen for the Page Heading.

4. Change the literals on line 1 to read:

   ```
   Customer Details Report: 3
   ```

5. Press Enter.

Your screen should look like the following example:



Level 1 Break Heading and Level 2 Break Heading Linesets

As you can see from your report sketch, there are no changes to the heading for break on SALES-AREA or the heading for break on CUSTOMER-NO. You do not need to make any changes to these break levels.

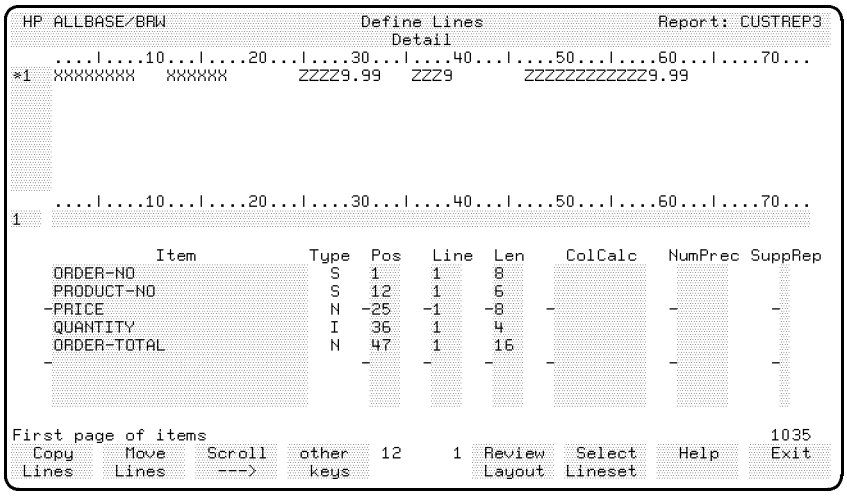
The Detail Lineset

The next lineset to be altered is the detail lineset. The detail lineset for this report is identical to that of the previous report, except that the total for order must be amended to print the dollar sign. To do this, you must alter the **item edit** for item ORDER-TOTAL.

Look at the item edit for ORDER-TOTAL

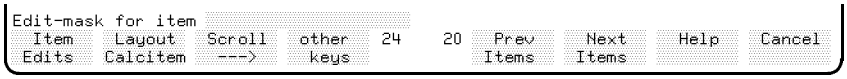
1. Choose `Select Lineset`.
2. Specify the lineset level `D` (for detail).

   BRW displays the Define Lines screen for the detail lineset.



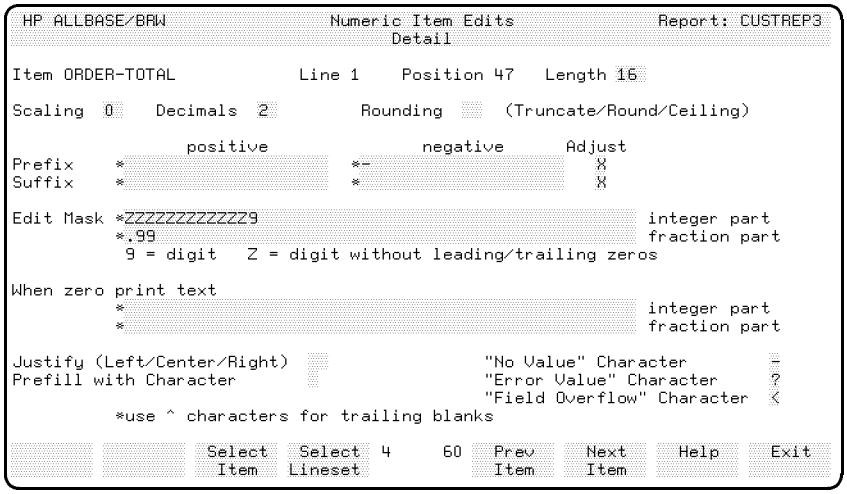
3. Choose `Item Edits`.

   BRW displays the following prompt:



4. Type `ORDER-TOTAL`.
5. Press Enter.

   BRW displays the Item Edit screen for the numeric item ORDER-TOTAL, as shown below.



This edit mask is for item ORDER-TOTAL, when positioned on line 1, position 47, on the detail lineset.

Note

The Line and Position fields edit mask

You can position ORDER-TOTAL (or any other item) as many times as you like in a report, and each position can have a different edit mask. Each edit mask affects only how an item will appear when printed in a certain position.

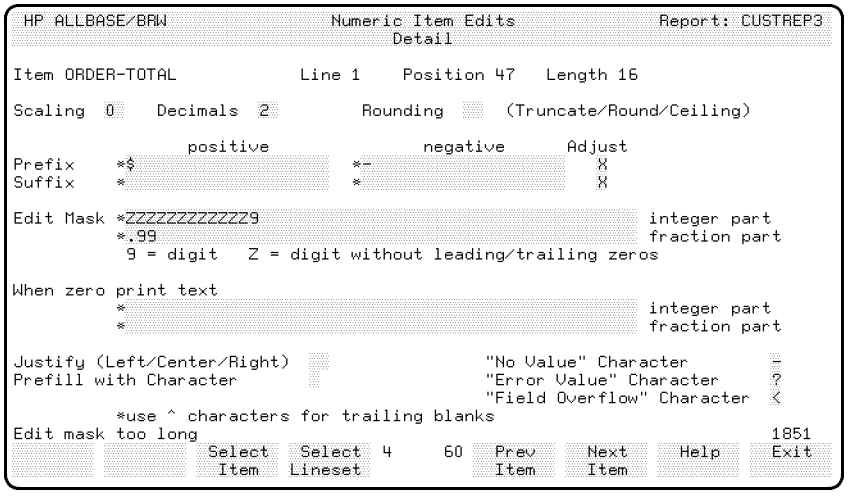
The edit mask is ZZZZZZZZZZZZ9.99. Note that the item length is 16. Therefore, the item can have a maximum of exactly 16 characters, that is, 13 numbers before the decimal point, the decimal point, and two numbers after it. If the number is negative, BRW prints a minus sign before the number. However, the item's length cannot exceed 16, therefore, negative numbers can have only 12 numbers before the decimal point. You cannot define an edit mask that is larger than the item length.

Each 9 denotes a digit. Each Z also denotes a digit, but a digit that is only be printed if it is significant. That is, leading zeros are not printed. In the current example, the number 12.90 will be printed 12.90, not 0000000000012.90. Had the Z's in the edit mask been 9s, then the leading zeros would not be suppressed.

Add a prefix

You want to add a $ prefix to the number.

1. Type $ in the positive Prefix field.
2. Press Enter.



BRW highlights the Length field and tells you that the edit mask is too long. You need room for the extra character.

3. Go to the Edit Mask field, delete one of the Z's.
4. Press Enter.

```
HP ALLBASE/BRW                Numeric Item Edits                Report: CUSTREP3
                                    Detail

Item ORDER-TOTAL            Line 1    Position 47   Length 16

Scaling  0    Decimals  2         Rounding     (Truncate/Round/Ceiling)

                  positive              negative       Adjust
Prefix     *$                    *-                     X
Suffix     *                     *                      X

Edit Mask *ZZZZZZZZZZZ9                                  integer part
          *.99                                           fraction part
           9 = digit   Z = digit without leading/trailing zeros

When zero print text
          *                                              integer part
          *                                              fraction part

Justify (Left/Center/Right)                  "No Value" Character        -
Prefill with Character                       "Error Value" Character     ?
                                             "Field Overflow" Character  <
          *use ^ characters for trailing blanks
Item Edits modified                                                      1820
          Select  Select  4     60   Prev    Next    Help    Exit
           Item   Lineset           Item    Item
```

Now BRW accepts the edit mask, and tells you the item edits were modified.

Note

You could have also made room for the dollar sign by increasing the length of the edit mask to 17, rather then by taking away a possible digit. However, 11 digits before the decimal point still allows you a maximum number of 99999999999.99: quite large enough for item ORDER-TOTAL.

Look at the Adjust field

An X in this field means that the prefix or suffix will be printed next to the number. If the Adjust field is blank, the prefix or suffix will be printed at the beginning or end of the edit mask, no matter how small the number.

You want the dollar sign to print directly before the first digit of the number, so leave the Adjust field unchanged.

Put commas in the edit mask for ORDER-TOTAL

You can use any symbol (except Z or 9) in the edit mask. For this report, you want to separate the number with commas to make the number easier to read.

1. Put commas between every three digits, starting with the digit on the right, replacing the Z at that character position. (Be sure to count the 9 as one of the digits.)

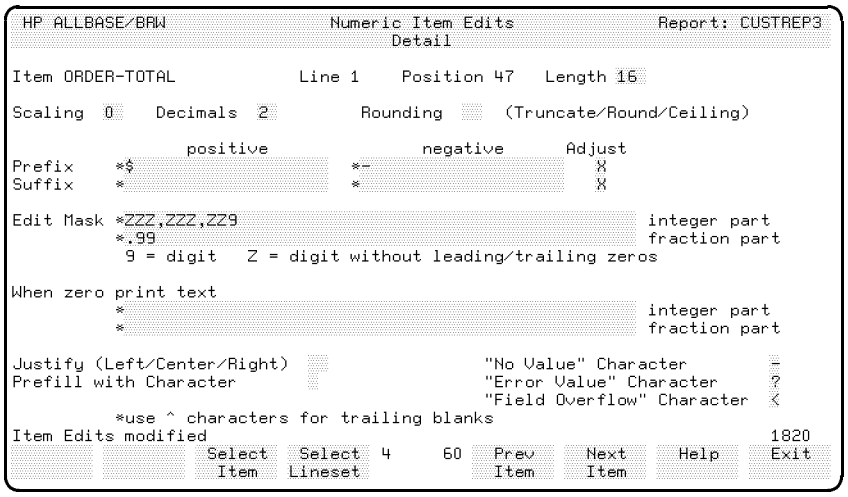
   With commas between every three digits, the first character in the edit mask would be a comma.

   ```
   Edit Mask  *,ZZZ,ZZZ,ZZ9
   ```

2. Delete the Z that would be a comma at the beginning.

The maximum number for this item is now 999,999,999. For this report that is sufficient. In other reports you create, you can change the edit mask to accommodate the maximum number you need for the report total.

The Edit Mask field should appear as shown in this screen:

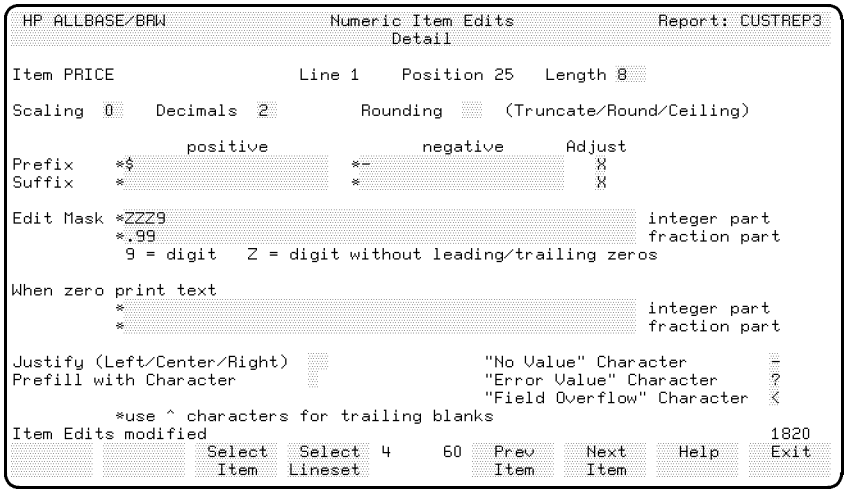


Now, if ORDER-TOTAL is 2000.90, it will be printed as $2,000.90. Note that the leading zeros and commas are suppressed.

Change the edit mask for PRICE

1. Choose `Prev Item` until the edit mask for item PRICE is displayed.
2. Add a dollar sign as prefix.
3. Delete one of the Z's.

Your screen should look like this screen:



You have now altered all the edit masks for the detail lineset.

The Level 2 Break Footing Lineset

You must now alter the edit mask for item TURNOVER-MTD on the level 2 break footing lineset, that is, the footing for break on CUSTOMER-NO.

Change the edit mask for TURNOVER-MTD

1. Choose `Select Lineset` on the Item Edits screen.

   You can go directly to the Item Edits screen for another lineset. This feature is helpful here, because the only alterations to be made to the level 2 break footing are item edits.

2. Choose `Select Lineset`.
3. Select the lineset level `2`.
4. Select `F` for footing.

   BRW displays the Item Edits screen for item CUSTOMER-NAME on the footing for break on CUSTOMER-NO.

5. Choose `Next Item`.

   BRW displays the edit mask for item TURNOVER-MTD.

6. Add the commas and the dollar sign as you did with item ORDER-TOTAL on the detail lineset.

Your screen should look like this:

```
 HP ALLBASE/BRW               Numeric Item Edits               Report: CUSTREP3
                      Footing for Break Level 2 on CUSTOMER-NO

Item TURNOVER-MTD            Line 2    Position 57    Length 16

Scaling  0    Decimals  2          Rounding      (Truncate/Round/Ceiling)

                 positive                negative       Adjust
Prefix    *$                      *-                       X
Suffix    *                       *                        X

Edit Mask *ZZZ,ZZZ,ZZ9                                         integer part
          *.99                                                 fraction part
           9 = digit   Z = digit without leading/trailing zeros

When zero print text
          *                                                    integer part
          *                                                    fraction part

Justify (Left/Center/Right)                      "No Value" Character        -
Prefill with Character                           "Error Value" Character     ?
                                                 "Field Overflow" Character  <
          *use ^ characters for trailing blanks
Item Edits modified                                                        1820
                    Select   Select  4     60  Prev     Next     Help     Exit
                     Item   Lineset            Item     Item
```

There are no other changes on this lineset.

Change the Item Edit for SALES-AREA.

1. Choose `Select Lineset`.
2. Select the lineset level `1`.

3. Select `F` for footing.

   BRW displays the Item Edits screen for item TURNOVER-MTD on the break footing on SALES-AREA.

4. Add the commas and the dollar sign as you did with item ORDER-TOTAL on the detail lineset.

Print a message for a zero value

There is one more alteration to make to this edit mask. Note that the item TURNOVER-MTD on this break footing is the sum of all the customers in the area. It is possible, however, that when running the report this value is zero, because you selected a subset of customers, and the subset excludes some or all of the customers in a sales area. In this case, you should print a reminder that the customers reported may be a subset of all your customers. You can do this by substituting a message for the item if the item is zero.

1. Look at the field labeled "When zero print text."

   You can specify characters in these fields that will be be printed if the item is zero. You cannot have more characters in this field than the length of the item.

2. Type the message `!!SUBSET ONLY` in the first (integer part) field.

3. Type `!!` in the second (fraction part) field.

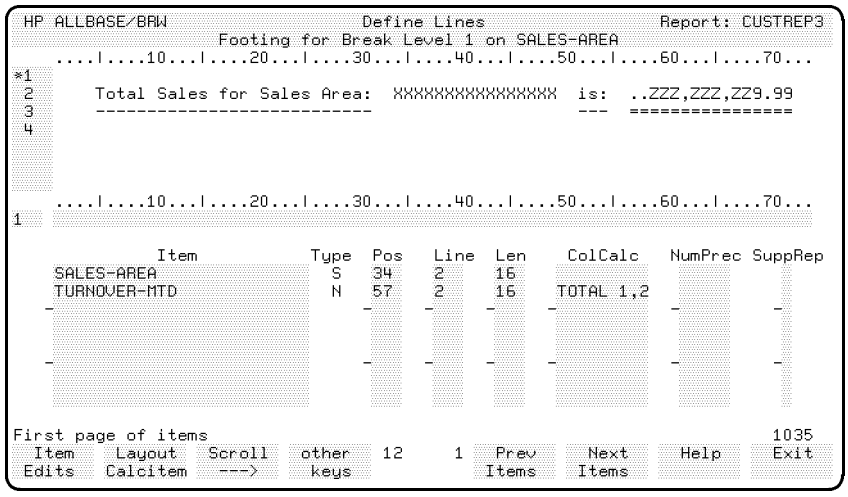
4. Press Enter.

Your screen should look like the following screen.

```
HP ALLBASE/BRW                  Numeric Item Edits              Report: CUSTREP3
                      Footing for Break Level 1 on SALES-AREA

Item TURNOVER-MTD           Line 2    Position 57   Length 16

Scaling  0    Decimals  2         Rounding     (Truncate/Round/Ceiling)

                  positive              negative       Adjust
Prefix     *$                    *-                      X
Suffix     *                     *                       X

Edit Mask *ZZZ,ZZZ,ZZ9                                          integer part
          *.99                                                  fraction part
           9 = digit   Z = digit without leading/trailing zeros

When zero print text
          *!!SUBSET ONLY                                        integer part
          *!!                                                   fraction part

Justify (Left/Center/Right)                "No Value" Character        -
Prefill with Character                     "Error Value" Character     ?
                                           "Field Overflow" Character  <
          *use ^ characters for trailing blanks
Item Edits modified                                                   1820
          Select  Select  4     60   Prev    Next    Help    Exit
           Item   Lineset           Item    Item
```

Now whenever this item is a zero, the message "!!SUBSET ONLY!!" will be printed in the item field, to remind users that they may have selected only a subset of customers.

You must also alter the actual lineset, so choose `Exit` to go to the Define Lines screen.



The existing lineset prints the total for all customers in the sales area. But this could be misleading in this report, as the user can select a subset of customers, using the parameter CUSTOMER-NO. You must therefore emphasize that this lineset prints only those customers selected, that is, the value of TURNOVER-MTD will be the total for the selected customers in the sales area.

You can alter line 2 so that it prints the same data, but reminds the user that a subset of customers may have been selected.

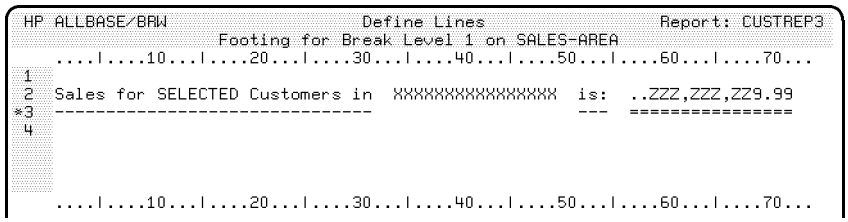
Print a reminder

1. Type the following text in line 2, beginning at character position 1:

   ```
   Sales for SELECTED Customers in
   ```

2. Alter the underlining to match the text.

The report window of your screen should now look like the following example:



Anyone running this report will be reminded that only those customers that were selected will be reported upon. They can find out which customers were selected by looking at the value for parameter CUSTOMER-NO, which is printed on the report heading.

The Report Footing Lineset

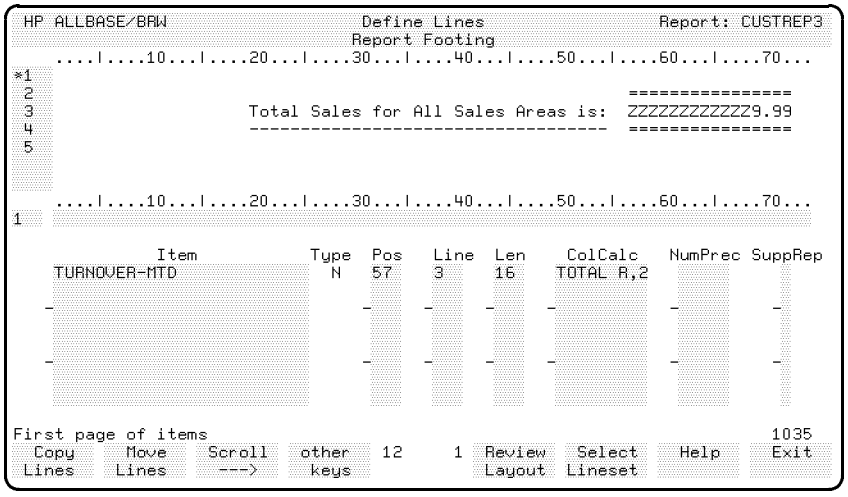
The next lineset to be altered is the report footing lineset.

The existing report footing lineset prints the total for all customers in all sales area. But, as with the previous lineset, this could be misleading in this report, as the user can select a subset of customers, using the parameter CUSTOMER-NO. You must emphasize that this lineset prints the total for only those customers selected, that is, the value of TURNOVER-MTD will be the total for the selected customers in all sales areas.

You can alter line 3 so that it prints the same data, but reminds the user that the total will be the total of the selected customers.

Change the report footing

1. Go to the Define Lines screen for the report footing.



2. Type the following text in line 3, beginning at character position 4.

```
Total for SELECTED Customers in All Sales Areas is:
```

3. Alter the underlining to match.

Now anyone running this report will be reminded that only those customers that were selected will be reported upon. They can find out which customers were selected by looking at the value for parameter CUSTOMER-NO, which is printed on the report heading.

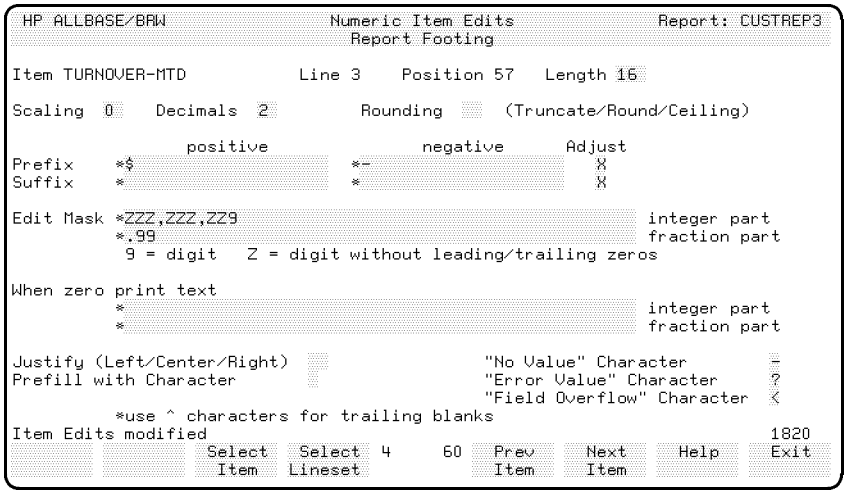
Change the edit mask for TURNOVER-MTD

The final operation is to amend the edit mask for item TURNOVER-MTD.

1. Choose `Item Edits`.
2. Select TURNOVER-MTD.

3. Add the commas and the dollar sign as you did with item ORDER-TOTAL on the detail lineset.

   Your screen should look like the following screen.



4. Choose `Exit` to return to the Define Lines screen.

LESSON 4: Quiz 4

Please answer the following questions. The solutions to these questions are supplied in Appendix A.

1. From where does BRW take the value of standard item REPORT-DESCRIPT?

2. How could you specify that a negative value for an item be printed in parentheses?

3. "If you define TURNOVER-MTD on the Item Edits screen with Scaling = 0, Decimals = 0, and Rounding = T, you will truncate item TURNOVER-MTD so that it has no decimals." True or False?

4. Explain the difference between Item Edits and NumPrec.

5. How could you print the item ORDER-NO with a space between each letter? (That is, "ORD-011" is printed "O R D - 0 1 1").

6. Could you also print item ORDER-NO without the above edit mask (that is, without spaces between each letter): (a) In the same report? (b) In the same lineset? (c) On the same line?

Exercise 7: Reviewing the Layout

Your report is now ready to be compiled. But, before you compile it, you can review the layout to see, online, how the report will look when printed. *This exercise takes about 5 minutes.*

Review the report layout

1. Choose `other keys` until `Review Layout` is displayed.
2. Choose `Review Layout`.

   BRW displays the following screen.

```
HP ALLBASE/BRW                    Review Layout                    Report: CUSTREP3

     ....|....10...|....20...|....30...|....40...|....50...|....60...|....70.
  RH1>Report:  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX Date: 0m/0d/
  RH2 -------                                                               -----
  RH3
  RH4 Report requested by: XXXXXXXX  at: HH:0M
  RH5 --------------------           ---
  RH6
  RH7>This report prints order details for selected customers in all Sales Are
  RH8 in June, followed by the total sales for all Sales Areas in June.
  RH9>This report prints the orders for selected customers in Area XXXXXXXXXXX
  RH10in June, followed by the total sales in June for that Sales Area.
  RH11
  RH12Customers were selected for this report depending upon the values you
  RH13gave for the parameters shown below.  Note: If CUSTOMER-NO is blank, all
  RH14customers are selected.
  RH15
  RH16    Parameter        Value (if any)
  RH17    ---------        --------------
  RH18
  RH19    XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
     ....|....10...|....20...|....30...|....40...|....50...|....60...|....70.

Define  Print   Scroll  Scroll  1     1  Prev    Next    Help    Exit
Lines   Layout  <---    --->           Page    Page
```

You can use the `Next Page` and `Prev Page`s to see the rest of the report, or you can choose `Print Layout` to print a copy of it.

Note

By using the `Print Layout`, it is possible to print draft layouts of your reports, so that you compare them with the rough draft before compiling and printing them.

3. Choose `Exit` twice to return to the Select Report screen.

Exercise 8: Compiling the Report

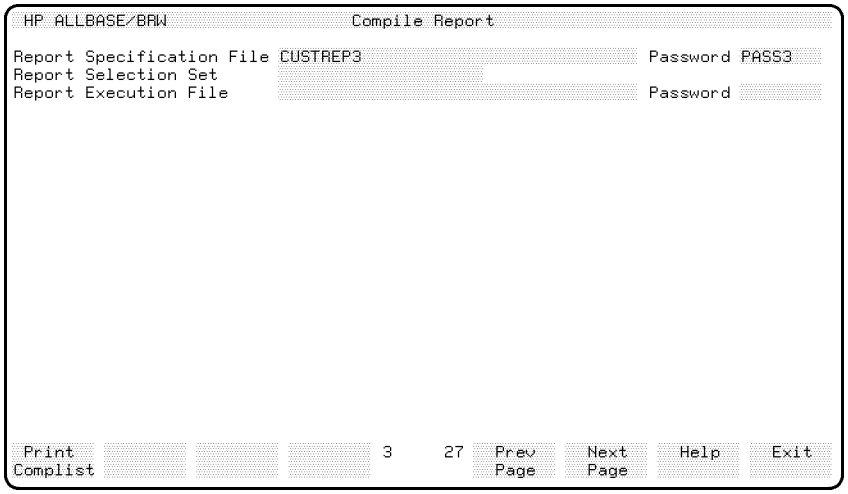
In this exercise you will compile the report **specification file** to produce a report **execution file**. *This exercise takes 10 minutes.*

You compile the report specification file, in combination with a selection set, to produce the report execution file. Compilation of a report is fully described in the *HP ALLBASE/BRW Reference Manual*.

You will need to compile the report twice, once with the selection set DIRECTORS, and once with the selection set SALES-MANAGERS.

Compile the report

1. Go to the Compile Report screen.



2. Type `DIRECTORS` in the Report Selection Set field.
3. Type `DIRECTRS.BRWEXEC` in the Report Execution File field.
4. Press Enter.

   BRW compiles the report.

When the compilation is finished, the screen display should be similar to the following example:

```
 HP ALLBASE/BRW                      Compile Report

Report Specification File CUSTREP3                          Password PASS3
Report Selection Set      DIRECTORS
Report Execution File     DIRECTRS.BRWEXEC                  Password


HP ALLBASE/BRW (A.01.31)  HP35360 (c) Copyright Hewlett-Packard GmbH 1986-92


Configuration File opened is BRWCONF.PUB.SYS

Specification File: CUSTREP3/.BRWSPEC.ITF3000
Selection Set     : DIRECTORS
Execution File    : DIRECTRS/.BRWEXEC.ITF3000
*** WARNING: Parameter AREA not defined in selection set,
             NO_VALUE used instead


D A T A   A C C E S S   S T R U C T U R E
=========================================
CUSTREP3-DATA (WORK003) join of:

Report compiled                                                           2109
 Print                                   3* 27   Prev     Next     Help    Exit
Complist                               C  n      Page     Page
```

The message "Report compiled" tells you that the compile was successful.

You can read the compilation listing from the screen.

Note

Look the warning for parameter AREA. This parameter is not defined in the selection set, and so BRW will use NO_VALUE whenever it is used in the report. As this parameter is not used when the report is compiled with selection set DIRECTORS, this warning can be disregarded.

Print the compilation listing for directors

The compilation listing tells you how the data was accessed (under DATA ACCESS STRUCTURE).

You will need the compilation listing later in this lesson to show the improvements when using keyed access.

1. Choose `Print Complist`.

   BRW then prompts for the print device, as shown in this example:

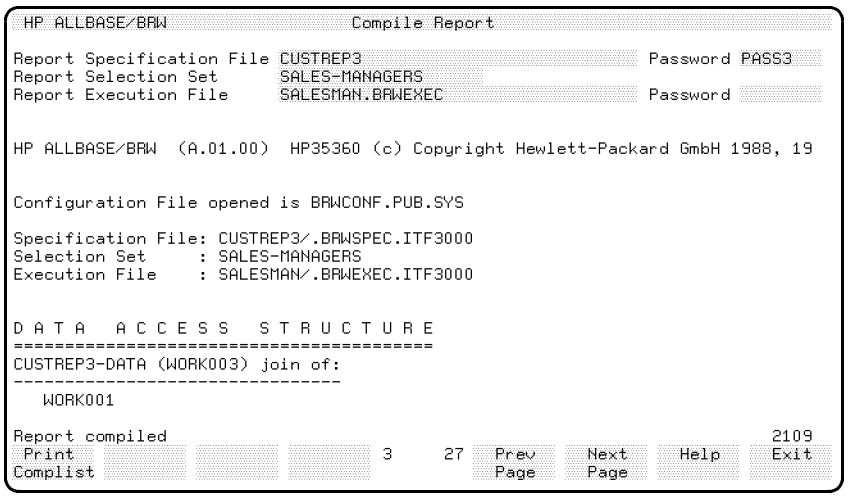
```
Print device LP
 Print                                 24    14  Prev     Next     Help    Cancel
Complist                                         Page     Page
```

2. Press (Enter) to send the compilation listing to the line printer.

   (Or, type in a new device name and press (Enter) if you want to print to another device.)

Compile the report for sales managers

1. Type `SALES-MANAGERS` in the Selection Set field.
2. Type `SALESMAN.BRWEXEC` in the Report Execution File field.
3. Press Enter.



The message "Report compiled" tells you that the compile was successful. There is no warning this time: parameter AREA, used in the report, is also defined in the selection set.

4. Choose `Exit` to return to the Select Report screen.

Exercise 9: Request the Report

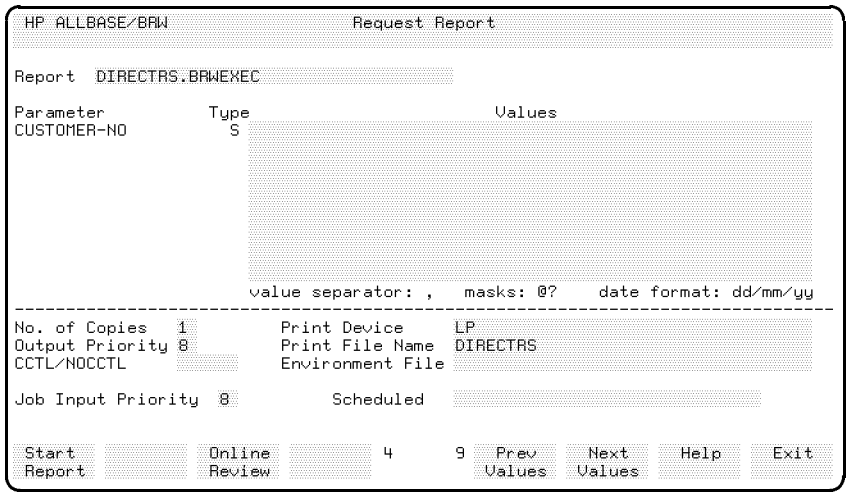
This exercise shows you how to enter values for parameters, and explains the use of "required" parameters. *This exercise takes 10 minutes.*

When you request the report, BRW streams a job that runs the execution file to produce the report. For this report you have two execution files, one compiled with selection set DIRECTORS, the other with selection set SALES-MANAGERS. This time, you can restrict the customers reported using parameters. Four examples are given, two from each execution file, one without restrictions, and one with a subset of customers.

Request the report for directors

1. Type the name of the first execution file (for example, `DIRECTRS.BRWEXEC`) in the Report field.
2. Choose `Request Report`.

   BRW displays the Request Report screen with the parameter information for the directors report.



   Look at the parameter CUSTOMER-NO. BRW reads the execution file and obtains the names and types of any parameters that you defined in the report selection set, and displays them on the Request Report screen.

   The Type field indicates the parameter result (or data) type. In this case the parameter is of type "S"—string.

3. For this report, leave the Values field blank.

   CUSTOMER-NO is a comparison predicate parameter, so you can enter an operator and a value in this field. However, if you leave the Values field blank for a comparison predicate parameter, all values are taken.

4. Choose `Start Report`.

5. Respond to the prompts for user, account, group and passwords until BRW returns the job number.

   BRW displays the message "Job streamed, Job number is #J*nnn*". The Reqest Report screen is still displayed.

Request the directors report with restrictions

1. Type `> "000002"` in the Values field beside CUSTOMER-NO.

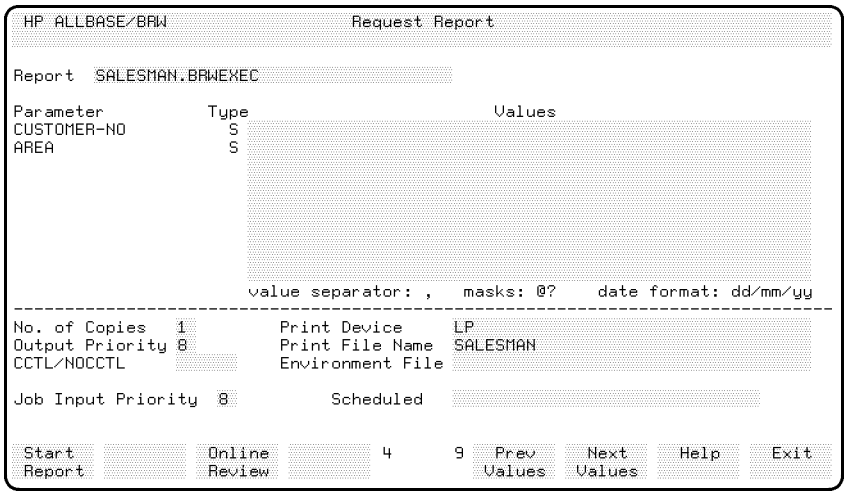
2. Start the report again.

Request the report for sales managers

Now you want to request the report for the execution file compiled with selection set SALES-MANAGERS.

1. Type the name of the second execution file, (for example, `SALESMAN.BRWEXEC`) in the Report field (overwriting DIRECTRS).

2. Press Enter.

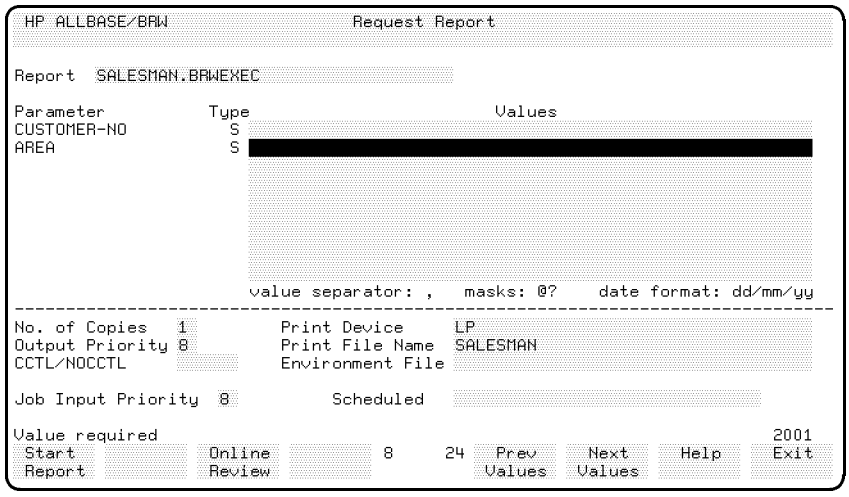


   BRW displays the parameters from the new execution file. As both AREA and CUSTOMER-NO are defined in the selection set SALES-MANAGERS, both are displayed on the Request Report screen.

Note

You can only supply a value for a parameter at run time if you include it in a selection set and compile the report with that selection set.

3. You do not want to restrict any customers in this run, so just press the `Start Report` to start the report.



BRW highlights the Values field beside AREA. This is because a value is required for this parameter and so you cannot run the report without a value for it.

4. Type `"WESTERN"` in the Values field beside AREA.
5. Choose `Start Report`.
6. Respond to the prompts until BRW returns the job number.

Run this report with a subset of customers

1. Type `> "000002"` in the Values field beside CUSTOMER-NO and Choose `Start Report`.
2. Respond to the prompts until BRW returns the job number.

Further restrict the report

Test the printing of "!!SUBSET ONLY!!".

1. Start the report again with SALES-AREA = "WESTERN" and CUSTOMER-NO = "000006".

Example Printouts

Your five reports should look like the following illustrations.

Run (1)

No restrictions on the report execution file DIRECTRS. A copy of this file is held in file SOL3DIR1.BRWONLNE.ITF3000.

```
Report:  Customer Details Report: Tutorial Lesson 4         Date: 04/20/92
-------                                                     -----

Report requested by: DAVE      at: 16:22
--------------------           ---

This report prints order details for selected customers in all Sales Areas
in June, followed by the total sales for all Sales Areas in June.

Customers were selected for this report depending upon the values you
gave for the parameters shown below.  Note: If CUSTOMER-NO is blank, all
customers are selected.

    Parameter        Value (if any)
    ---------        --------------

    CUSTOMER-NO
```

```
    Page:   2          Customer Details Report: 3          Date:  04/20/92
    -----              --------------------------          -----

    Customer Details for Sales Area:  EASTERN
    ---------------------------------

Customer:  FOURTH ESTATE MAGAZINES          Number:  000004
---------                                   -------

Order No.  Product No.     Price   Quantity    Total for Order
---------  -----------     -----   --------    ---------------

ORD-004    A00002         $12.50      1                $12.50

Sales for Customer: FOURTH ESTATE MAGAZINES        is:           $12.50
                                                                -----------------

Sales for SELECTED Customers in  EASTERN           is:           $12.50
------------------------------                     ---  ================
```

```
    Page:   1          Customer Details Report: 3          Date:  04/20/92
    -----              -------------------------          -----

    Customer Details for Sales Area:  NORTHERN
    ---------------------------------

Customer:  7-UP NOVELTIES                   Number:  000007
---------                                   -------

******************** NO ORDERS FOR THIS CUSTOMER ********************

Customer:  EIGHT-BALL CUES INC              Number:  000008
---------                                   -------

Order No.  Product No.     Price   Quantity    Total for Order
---------  -----------     -----   --------    ---------------

ORD-011    A00004         $15.25     63               $960.75
ORD-012    A00008          $0.95      2                 $1.90
ORD-013    A00003          $1.25      1                 $1.25
ORD-014    A00002         $12.50      6                $75.00

Sales for Customer: EIGHT-BALL CUES INC            is:         $1,038.90
                                                               ----------

Sales for SELECTED Customers in  NORTHERN          is:         $1,038.90
-------------------------------                    ---  ==========
```

```
    Page:   1          Customer Details Report: 3          Date:  04/20/92
    -----              -------------------------          -----

    Customer Details for Sales Area:  SOUTHERN
    ---------------------------------

Customer:  SECOND GOODS INC.                Number:  000002
---------                                   -------

Order No.  Product No.     Price   Quantity    Total for Order
---------  -----------     -----   --------    ---------------

ORD-002    A00005         $17.45      5                $87.25
ORD-008    A00007          $1.75     25                $43.75
ORD-010    A00003          $1.25      3                 $3.75

Sales for Customer: SECOND GOODS INC.              is:           $136.55
                                                                -----------

Customer:  FIFTH AVENUE FASHIONS            Number:  000005
---------                                   -------

Order No.  Product No.     Price   Quantity    Total for Order
---------  -----------     -----   --------    ---------------

ORD-005    A00001          $0.75     15                $11.25
ORD-006    A00005         $17.45      2                $34.90

Sales for Customer: FIFTH AVENUE FASHIONS          is:            $46.15
                                                                -----------

Sales for SELECTED Customers in  SOUTHERN          is:           $182.70
-------------------------------                    ---  ===========
```

```
     Page:   1          Customer Details Report: 3          Date:  04/20/92
     -----              -------------------------          -----

     Customer Details for Sales Area:  WESTERN
     ---------------------------------

Customer:  FIRST REALTY INC.                Number:  000001
---------                                   -------

Order No.  Product No.     Price   Quantity    Total for Order
---------  -----------     -----   --------    ---------------

ORD-001    A00003          $1.25     10                $12.50
ORD-009    A00001          $0.75     10                 $7.50

Sales for Customer: FIRST REALTY INC.              is:            $20.00
                                                                 ----------

Customer:  THIRD-FLOOR DESIGN INC           Number:  000003
---------                                   -------

Order No.  Product No.     Price   Quantity    Total for Order
---------  -----------     -----   --------    ---------------

ORD-003    A00010          $1.85     10                $18.50
ORD-007    A00006         $25.00     11               $275.00

Sales for Customer: THIRD-FLOOR DESIGN INC         is:           $293.50
                                                                 ----------

Customer:  SIX-GUN SALOONS INC              Number:  000006
---------                                   -------

******************** NO ORDERS FOR THIS CUSTOMER ********************

Sales for SELECTED Customers in  WESTERN           is:           $313.50
-------------------------------                    ---  ================
```

```
     Page:   2          Customer Details Report: 3          Date:  04/20/92
     -----              -------------------------          -----

                                                           ==========
   Total for SELECTED Customers in All Sales Areas is:         $1,547.60
   -------------------------------------------------------  ==========
```

Run (2) Report execution file DIRECTRS, run with the parameter CUSTOMER-NO > "000002". A copy of this file is held in file SOL3DIR2.BRWONLNE.ITF3000.

```
Report:  Customer Details Report: Tutorial Lesson 4         Date: 04/20/92
-------                                                     -----

Report requested by: DAVE      at: 16:23
--------------------           ---

This report prints order details for selected customers in all Sales Areas
in June, followed by the total sales for all Sales Areas in June.
Customers were selected for this report depending upon the values you
gave for the parameters shown below.  Note: If CUSTOMER-NO is blank, all
customers are selected.

    Parameter        Value (if any)
    ---------        --------------

    CUSTOMER-NO          &daklt; "000002"
```

```
    Page:   2          Customer Details Report: 3          Date:  04/20/92
    -----              --------------------------          -----

    Customer Details for Sales Area:  EASTERN
    --------------------------------

Customer:  FOURTH ESTATE MAGAZINES          Number:  000004
---------                                   -------

Order No.  Product No.     Price   Quantity    Total for Order
---------  -----------     -----   --------    ---------------

ORD-004    A00002         $12.50      1                $12.50

Sales for Customer: FOURTH ESTATE MAGAZINES        is:            $12.50
                                                                 ----------

Sales for SELECTED Customers in  EASTERN           is:            $12.50
-------------------------------                    ---  ==========
```

```
    Page:   1          Customer Details Report: 3          Date:  04/20/92
    -----              -------------------------          -----

    Customer Details for Sales Area:  NORTHERN
    ---------------------------------

Customer:  7-UP NOVELTIES                   Number:  000007
---------                                   -------

******************** NO ORDERS FOR THIS CUSTOMER ********************

Customer:  EIGHT-BALL CUES INC              Number:  000008
---------                                   -------

Order No.  Product No.     Price   Quantity    Total for Order
---------  -----------     -----   --------    ---------------

ORD-011    A00004         $15.25     63               $960.75
ORD-012    A00008          $0.95      2                 $1.90
ORD-013    A00003          $1.25      1                 $1.25
ORD-014    A00002         $12.50      6                $75.00

Sales for Customer: EIGHT-BALL CUES INC            is:         $1,038.90
                                                               ----------

Sales for SELECTED Customers in  NORTHERN          is:         $1,038.90
---------------------------------                  ---  ==========
```

```
    Page:   1          Customer Details Report: 3          Date:  04/20/92
    -----              -------------------------          -----

    Customer Details for Sales Area:  SOUTHERN
    ---------------------------------

Customer:  FIFTH AVENUE FASHIONS            Number:  000005
---------                                   -------

Order No.  Product No.     Price   Quantity    Total for Order
---------  -----------     -----   --------    ---------------

ORD-005    A00001          $0.75     15               $11.25
ORD-006    A00005         $17.45      2               $34.90

Sales for Customer: FIFTH AVENUE FASHIONS          is:            $46.15
                                                               ----------

Sales for SELECTED Customers in  SOUTHERN          is:            $46.15
---------------------------------                  ---  ==========
```

```
    Page:   1          Customer Details Report: 3          Date:  04/20/92
    -----              --------------------------          -----

    Customer Details for Sales Area:  WESTERN
    ---------------------------------

Customer:  THIRD-FLOOR DESIGN INC           Number:  000003
---------                                   -------

Order No.  Product No.     Price   Quantity    Total for Order
---------  -----------     -----   --------    ---------------

ORD-003    A00010          $1.85     10                $18.50
ORD-007    A00006         $25.00     11               $275.00

Sales for Customer: THIRD-FLOOR DESIGN INC         is:           $293.50
                                                              ----------

Customer:  SIX-GUN SALOONS INC              Number:  000006
---------                                   -------

******************** NO ORDERS FOR THIS CUSTOMER ********************

Sales for SELECTED Customers in  WESTERN           is:           $293.50
-------------------------------                    ---  ================
```

```
    Page:   2          Customer Details Report: 3          Date:  04/20/92
    -----              --------------------------          -----

                                                          ================
   Total for SELECTED Customers in All Sales Areas is:         $1,391.05
   -------------------------------------------------------  ================
```

Run (3) Report execution file SALESMAN run with parameter AREA = "WESTERN". No restriction on the customers reported. A copy of this file is held in file SOL3SMN1.BRWONLNE.ITF3000.

```
Report:  Customer Details Report: Tutorial Lesson 4         Date: 04/20/92
-------                                                     -----

Report requested by: DAVE      at: 16:30
--------------------           ---

This report prints the orders for selected customers in Area WESTERN
in June, followed by the total sales in June for that Sales Area.
Customers were selected for this report depending upon the values you
gave for the parameters shown below.  Note: If CUSTOMER-NO is blank, all
customers are selected.

    Parameter        Value (if any)
    ---------        --------------

    CUSTOMER-NO
    AREA                 "WESTERN"
```

```
    Page:   2          Customer Details Report: 3          Date:  04/20/92
    -----              -------------------------           -----

    Customer Details for Sales Area:  WESTERN
    --------------------------------

Customer:  FIRST REALTY INC.                Number:  000001
---------                                   -------

Order No.  Product No.     Price   Quantity    Total for Order
---------  -----------     -----   --------    ---------------

ORD-001    A00003          $1.25     10                $12.50
ORD-009    A00001          $0.75     10                 $7.50

Sales for Customer: FIRST REALTY INC.              is:            $20.00
                                                                -----------

Customer:  THIRD-FLOOR DESIGN INC           Number:  000003
---------                                   -------

Order No.  Product No.     Price   Quantity    Total for Order
---------  -----------     -----   --------    ---------------

ORD-003    A00010          $1.85     10                $18.50
ORD-007    A00006         $25.00     11               $275.00

Sales for Customer: THIRD-FLOOR DESIGN INC         is:           $293.50
                                                                -----------

Customer:  SIX-GUN SALOONS INC              Number:  000006
---------                                   -------

****************** NO ORDERS FOR THIS CUSTOMER ******************

Sales for SELECTED Customers in  WESTERN           is:           $313.50
-------------------------------                    ---  ===========
```

Run (4) Report execution file SALESMAN run with parameter AREA = "WESTERN" and parameter CUSTOMER-NO > "000002". No restriction on the customers reported. A copy of this file is held in file SOL3SMN2.BRWONLNE.ITF3000.

```
Report:  Customer Details Report: Tutorial Lesson 4         Date: 04/20/92
-------                                                     -----

Report requested by: DAVE      at: 16:34
--------------------           ---

This report prints the orders for selected customers in Area WESTERN
in June, followed by the total sales in June for that Sales Area.
Customers were selected for this report depending upon the values you
gave for the parameters shown below.  Note: If CUSTOMER-NO is blank, all
customers are selected.

    Parameter        Value (if any)
    ---------        --------------

    CUSTOMER-No          &daklt; "000002"
    AREA                 "WESTERN"
```

```
    Page:   2          Customer Details Report: 3          Date:  04/20/92
    -----              --------------------------          -----

    Customer Details for Sales Area:  WESTERN
    --------------------------------

Customer:  THIRD-FLOOR DESIGN INC           Number:  000003
---------                                   -------

Order No.  Product No.     Price   Quantity    Total for Order
---------  -----------     -----   --------    ---------------

ORD-003    A00010          $1.85     10                $18.50
ORD-007    A00006         $25.00     11               $275.00

Sales for Customer: THIRD-FLOOR DESIGN INC         is:           $293.50
                                                              ----------

Customer:  SIX-GUN SALOONS INC              Number:  000006
---------                                   -------

******************** NO ORDERS FOR THIS CUSTOMER ********************

Sales for SELECTED Customers in  WESTERN           is:           $293.50
-------------------------------                    ---  ==========
```

Run (5) Report execution file SALESMAN run with parameter AREA = "WESTERN" and parameter CUSTOMER-NO = "000006". Note that *SUBSET ONLY* is printed in the totals line for the sales area. This shows the use of the When zero print text field on the Numeric Item Edits screen.

```
Report:  Customer Details Report: Tutorial Lesson 4         Date: 04/20/92
-------                                                     -----

Report requested by: DAVE      at: 16:35
--------------------           ---

This report prints the orders for selected customers in Area WESTERN
in June, followed by the total sales in June for that Sales Area.
Customers were selected for this report depending upon the values you
gave for the parameters shown below.  Note: If CUSTOMER-NO is blank, all
customers are selected.

    Parameter        Value (if any)
    ---------        --------------

    CUSTOMER-NO          "000006"
    AREA                 "WESTERN"
```

```
    Page:   2          Customer Details Report: 3          Date:  04/20/92
    -----              --------------------------          -----

    Customer Details for Sales Area:  WESTERN
    --------------------------------

Customer:  SIX-GUN SALOONS INC              Number:  000006
---------                                   -------

******************** NO ORDERS FOR THIS CUSTOMER ********************

Sales for SELECTED Customers in  WESTERN           is:  !!SUBSET ONLY!!
-------------------------------                    ---  ================
```

LESSON 4: Quiz 5

Please answer the following questions. The solutions to these questions are supplied in Appendix A.

1. If you have a report with five different selection sets, and you compile the report with each set: (a) How many execution files will you have? (b) How many specification files will you have?

2. Can you request a report containing a "required" parameter without supplying a value for that parameter?

3. What will happen if a sales manager, when requesting the report execution file SALESMAN.BRWEXEC, enters a value of "HELLO MOTHER!" for parameter AREA?

4. Must you allow one report to finish before requesting another? If not, how many reports can be requested at one time?

Report Performance

This exercise explains how to read the compile listing and execution statistics, and how BRW accesses tables. This exercise also explains access blocks, the use of keyed access, and how to improve report performance. *This exercise takes 30 minutes.*

You have written and run the report, now you need to show the differences in performance when using keyed access. For this comparison, you need the compilation listing and execution statistics from lesson 3, because the report in lesson 3 does not use keyed access. If you do not have a printout of them, run the report again and obtain them. Or use the example of the compilation listing and execution statistics from Lesson 3 shown below.

Lesson 3 Compilation Listing

```
HP ALLBASE/BRW  (A.01.31)  HP35360 (c) Copyright Hewlett-Packard GmbH 1986-1992


Configuration File opened is BRWCONF.PUB.SYS

Specification File: CUSTREP2/.BRWSPEC.ITF3000
Selection Set     :
Execution File    : CUSTREP2/.BRWEXEC.ITF3000


D A T A   A C C E S S   S T R U C T U R E
=========================================
CUSTREP2-DATA (WORK007) join of:
--------------------------------
   WORK005
      CUSTOMERS,TOYDB.PUB  serial

   ORDER-PRODUCTS (WORK006) join of:
   ---------------------------------
      WORK003
         PRODUCTS,TOYDB.PUB  serial

      ORDER-TABLE (WORK004) join of:
      ------------------------------
         WORK001
            ORDERS,TOYDB.PUB  serial

         WORK002
            ORDER-DETAILS,TOYDB.PUB  serial
```

```
T A B L E   C A L C U L A T I O N S   A N D   S E L E C T I O N S
================================================================
CUSTREP2-DATA (WORK007)
   WORK005

   ORDER-PRODUCTS (WORK006)

WORK005
   CUSTOMERS,TOYDB.PUB

ORDER-PRODUCTS (WORK006)
   WORK003

   ORDER-TABLE (WORK004)

WORK003
   PRODUCTS,TOYDB.PUB

ORDER-TABLE (WORK004)
   WORK001

   WORK002

WORK001
   ORDERS,TOYDB.PUB

      Selection: month_of (ORDERS.ORDER-DATE) = 6

WORK002
   ORDER-DETAILS,TOYDB.PUB
```

Compilation Listing (Continued)

Lesson 3 Execution Statistics

```
HP ALLBASE/BRW  (A.01.31)  HP35360 (c) Copyright Hewlett-Packard GmbH 1986-1992

   KSAM    (A.07.03)

Configuration File opened is BRWCONF.PUB.SYS
Execution File: CUSTREP2.BRWEXEC.ITF3000
Parameters:
&daklt;


Access Block  1:                            #records     cpu-sec    elapsed-sec
                                           ----------  -----------  -----------
  read-dset serial ORDERS,TOYDB                   15        0.026        0.028
  write            WORK001                        14        0.067        0.213
  sort             WORK001                        14        0.019        0.019
  process                                                   0.344        0.807
                                                       ===========  ===========
  time totals for block                                     0.456        1.067
  (0     segment loads for block )


Access Block  2:                            #records     cpu-sec    elapsed-sec
                                           ----------  -----------  -----------
  read-dset serial ORDER-DETAILS,TOYDB            15        0.028        0.026
  write            WORK002                        15        0.076        0.244
  sort             WORK002                        15        0.016        0.015
  process                                                   0.034        0.036
                                                       ===========  ===========
  time totals for block                                     0.154        0.321
  (0     segment loads for block )


Access Block  3:                            #records     cpu-sec    elapsed-sec
                                           ----------  -----------  -----------
  read-dset serial PRODUCTS,TOYDB                 10        0.027        0.024
  write            WORK003                        10        0.074        0.237
  sort             WORK003                        10        0.014        0.015
  process                                                   0.035        0.034
                                                       ===========  ===========
  time totals for block                                     0.150        0.310
  (0     segment loads for block )


Access Block  4:                            #records     cpu-sec    elapsed-sec
                                           ----------  -----------  -----------
  read-mpe  serial WORK001                        14        0.032        0.093
  read-mpe  search WORK002                        14        0.034        0.097
  write            WORK004                        14        0.073        0.269
  sort             WORK004                        14        0.015        0.015
  process                                                   0.047        0.044
                                                       ===========  ===========
  time totals for block                                     0.201        0.518
  (0     segment loads for block )
```

```
Access Block  5:                              #records     cpu-sec    elapsed-sec
                                             ----------  -----------  -----------
  read-dset serial CUSTOMERS,TOYDB                    8        0.031        0.029
  write            WORK005                            8        0.065        0.367
  sort             WORK005                            8        0.014        0.014
  process                                                      0.092        0.184
                                                      ===========  ===========
  time totals for block                                        0.202        0.594
  (0     segment loads for block )


Access Block  6:                              #records     cpu-sec    elapsed-sec
                                             ----------  -----------  -----------
  read-mpe  serial WORK003                           10        0.031        0.093
  read-mpe  search WORK004                           14        0.031        0.093
  write            WORK006                           14        0.066        0.260
  sort             WORK006                           14        0.015        0.015
  process                                                      0.047        0.049
                                                      ===========  ===========
  time totals for block                                        0.190        0.510
  (0     segment loads for block )


Access Block  7:                              #records     cpu-sec    elapsed-sec
                                             ----------  -----------  -----------
  read-mpe  serial WORK005                            8        0.030        0.085
  read-mpe  search WORK006                           14        0.032        0.075
  write            WORK007                           16        0.074        0.453
  sort             WORK007                           16        0.021        0.020
  process                                                      0.047        0.052
                                                      ===========  ===========
  time totals for block                                        0.204        0.685
  (0     segment loads for block )


Access Block  8:                              #records     cpu-sec    elapsed-sec
                                             ----------  -----------  -----------
  read-mpe  serial WORK007                           16        0.036        0.110
  print            CUSTEXE2                          86        0.325        0.744
  process                                                      0.087        0.091
                                                      ===========  ===========
  time totals for block                                        0.448        0.945
  (1     segment loads for block )


Report Info    :                                          cpu-sec    elapsed-sec
                                                      ===========  ===========
  time totals for report                                       2.005        4.950

  (2     segment loads for report)
  (2     segments in report      )
  (2     segments in memory      )
```

Execution Statistics (Continued)

Access Blocks and Workfiles

The BRW reporting process is split into steps called **access blocks**. Each block has one or more input files and an **output file** (workfile). A workfile is sorted if it is to be used later in a **join**. The workfiles are temporary files, called WORK*nnn*. That is, the first workfile used is called WORK001, the second WORK002, and so on. The final workfile is the final access table for the report.

Access Structure

You can see the structure of the report access using the compilation listing. This shows the order in which the data is accessed, and how it is accessed.

Performance Information

Performance information is also found in the execution statistics. Whenever you run a report, execution statistics are printed to the standard list device. This listing shows the following information for each access block:

- Which files are input.
- How each input file is read.
- The number of records read.
- To which workfile the block's output is written.
- The number of records written.
- Whether or not sorting is done.
- The CPU time and elapsed time that was required to accomplish each of these tasks.

This listing can be used to help find the most efficient way to produce a particular report. You can reduce the time taken to perform a report in the following ways:

- By reducing the number of access blocks.
- By reducing the time taken to sort, read, and write files.
- By reducing the number of records used in the report as early as possible.

Default Access

By default, BRW reads each source table serially, in the order specified on the Define Table screen. BRW reads each table serially into a workfile. If the file is to be joined, BRW sorts the workfile, using the common item defined in the relation as the sort key.

Lesson 3 Execution Statistics Explanation

Look at the execution statistics for lesson 3.

- In the first Access Block, BRW reads the ORDERS data set serially and writes it into a work file, WORK001. This workfile is sorted on ORDER-NO.
- In the second access block BRW reads the data set ORDER-DETAILS into a second workfile, WORK002, and also sorts it on ORDER-NO.
- In the third access block, BRW reads the data set PRODUCTS serially, writes it to a workfile WORK003 and sorts the workfile on PRODUCT-NO.
- In the fourth access block, BRW joins the two workfiles WORK001 and WORK002 on ORDER-NO, and writes the resulting records into a third workfile, WORK004. This workfile is then sorted on PRODUCT-NO.
- In the fifth access block, BRW reads the data set CUSTOMERS serially, writes it to workfile WORK005, and sorts it on CUSTOMER-NO.
- In the sixth access block, BRW joins workfiles WORK003 and WORK004, and writes the result to WORK006.
- In the seventh access block, BRW joins WORK006 with WORK005, to produce the final access table, WORK007. This workfile is sorted on the sort items that you defined on the Define Breaks screen, that is on SALES-AREA, CUSTOMER-NO, and ORDER-NO.
- In the eighth access block, BRW reads the final access table (WORK007), and processes and prints the report.

Note that the time taken and records selected are all clearly displayed on the execution statistics.

Specifying The Access Sequence and Method

You can, however, specify both the order in which the data sets are read, and the method of access. For example, you know that you want to read all the records in ORDERS, so that you can determine which orders were for June. It is better to read this data set serially, because you want to read all the records in it.

Notice data set ORDER-DETAILS. You only want to access the records in this data set that have an ORDER-NO that matches the ORDER-NO in ORDERS. You can, therefore, use keyed access to ORDER-DETAILS on the item ORDER-NO. That is, when you have found the values of ORDER-NO in ORDERS that apply to June, you can use those values as keys into the data set ORDER-DETAILS. Using this method, you do not have to read ORDER-DETAILS into a workfile, sort the workfile, and then join the workfiles. By using keyed access, you know that you will retrieve exactly those record values that you want, that is, those records in ORDER-DETAILS

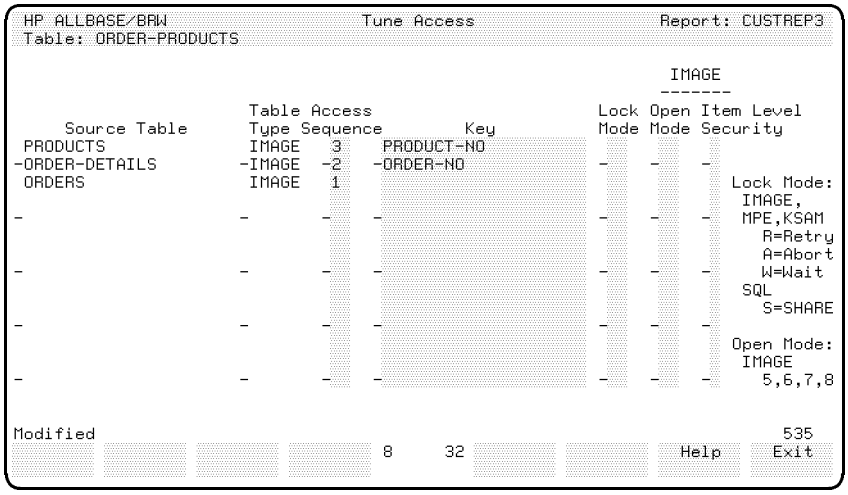
with ORDER-NOs that match the values of ORDER-NO in ORDERS.

The same is true of data set PRODUCTS. You only want information on those products that have been ordered in June, that is, that are present in the join of tables ORDERS and ORDER-DETAILS. So, if you use keyed access on PRODUCT-NO, using the values of PRODUCT-NO found in ORDER-DETAILS, you will automatically have the records that you want without any sorting. (If you read PRODUCTS serially, you would have to read it into a workfile, sort it on PRODUCT-NO, and then compare it, record-by-record, with the records in ORDER-DETAILS. This could be very inefficient if there were many products that had not been ordered in June.)

Keyed Access

So, by specifying keyed access on PRODUCTS and ORDER-DETAILS, you can improve report performance.

You specified the access sequence and keyed access on the Define Tables screen when defining the data access. The screen below shows the Tune Access screen, after you completed defining the data access.



To see how much more efficient this method is, compare the execution statistics of lesson 3 (execution file SOLUTN2.BRWEXEC.ITF3000) with the execution statistics of execution file SOL3DIR. The compilation and execution statistics are shown below.

Lesson 4 Compilation Listing

```
HP ALLBASE/BRW  (A.01.31)  HP35360 (c) Copyright Hewlett-Packard GmbH 1986-1992


Configuration File opened is BRWCONF.PUB.SYS

Specification File: CUSTREP3/.BRWSPEC.ITF3000
Selection Set     : DIRECTORS
Execution File    : DIRECTRS/.BRWEXEC.ITF3000
*** WARNING: Parameter AREA not defined in selection set,
             NO_VALUE used instead


D A T A   A C C E S S   S T R U C T U R E
========================================
CUSTREP3-DATA (WORK003) join of:
-------------------------------
   WORK001
      CUSTOMERS,TOYDB.PUB  serial

   ORDER-PRODUCTS (WORK002) join of:
   ---------------------------------
      ORDERS,TOYDB.PUB  serial
      ORDER-DETAILS,TOYDB.PUB  key: ORDER-No
      PRODUCTS,TOYDB.PUB  key: PRODUCT-No



T A B L E   C A L C U L A T I O N S   A N D   S E L E C T I O N S
=================================================================
CUSTREP3-DATA (WORK003)
   WORK001

   ORDER-PRODUCTS (WORK002)


WORK001
   CUSTOMERS,TOYDB.PUB

      Selection: CUSTOMERS.CUSTOMER-NO satisfies ?CUSTOMER-NO

ORDER-PRODUCTS (WORK002)
   ORDERS,TOYDB.PUB

      Selection: month_of (ORDERS.ORDER-DATE) = 6
                 and
                 ORDERS.CUSTOMER-NO satisfies ?CUSTOMER-NO

   ORDER-DETAILS,TOYDB.PUB

   PRODUCTS,TOYDB.PUB
```

Lesson 4 Execution Statistics

```
HP ALLBASE/BRW  (A.01.31)  HP35360 (c) Copyright Hewlett-Packard GmbH 1986-1992

   KSAM    (A.07.03)

Configuration File opened is BRWCONF.PUB.SYS
Execution File: DIRECTRS.BRWEXEC,ITF3000
Parameters:
&daklt;
CUSTOMER-NO
&daklt;


Access Block  1:                              #records     cpu-sec    elapsed-sec
                                             ----------  -----------  -----------
  read-dset serial CUSTOMERS,TOYDB                    8        0.033        0.031
  write            WORK001                            8        0.081        0.397
  sort             WORK001                            8        0.019        0.019
  process                                                      0.346        0.713
                                                      ===========  ===========
  time totals for block                                        0.479        1.160
  (0     segment loads for block )


Access Block  2:                              #records     cpu-sec    elapsed-sec
                                             ----------  -----------  -----------
  read-dset serial ORDERS,TOYDB                      15        0.030        0.027
  read-dset chain  ORDER-DETAILS,TOYDB               14        0.070        0.291
  read-dset calc   PRODUCTS,TOYDB                    14        0.025        0.024
  write            WORK002                           14        0.067        0.247
  sort             WORK002                           14        0.015        0.015
  process                                                      0.129        0.292
                                                      ===========  ===========
  time totals for block                                        0.336        0.896
  (0     segment loads for block )


Access Block  3:                              #records     cpu-sec    elapsed-sec
                                             ----------  -----------  -----------
  read-mpe  serial WORK001                            8        0.034        0.115
  read-mpe  search WORK002                           14        0.031        0.079
  write            WORK003                           16        0.072        0.482
  sort             WORK003                           16        0.021        0.021
  process                                                      0.049        0.055
                                                      ===========  ===========
  time totals for block                                        0.207        0.752
  (0     segment loads for block )
```

```
Access Block  4:                                #records     cpu-sec    elapsed-sec
                                               ----------  -----------  -----------
  read-mpe  serial WORK003                             16        0.036        0.099
  print            DIRECTRS                            99        0.340        0.640
  process                                                        0.082        0.083
                                                        ===========  ===========
  time totals for block                                          0.458        0.822
  (2     segment loads for block )


Report Info    :                                          cpu-sec    elapsed-sec
                                                        ===========  ===========
  time totals for report                                         1.480        3.630

  (3     segment loads for report)
  (3     segments in report      )
  (3     segments in memory      )
```

Execution Statistics (Continued)

Lesson 4 Execution Statistics Explanation

Look at the execution statistics for Lesson 4.

- In the first access block, BRW reads the CUSTOMERS data set serially into WORK001, and sorts it on CUSTOMER-NO.
- In the second access block, BRW reads the ORDERS data set serially. But, instead of writing the contents of ORDERS directly into a workfile, BRW performs a chained read into the detail data set ORDER-DETAILS, using as a key, the value of ORDER-NO obtained from the serial read of ORDERS. Then, BRW performs a calculated read on the master data set PRODUCTS, using as a key, the value of PRODUCT-NO retrieved from the data set ORDER-DETAILS. Only then is a record written to WORK002. Note that no separate workfiles or sorts are needed for PRODUCTS or ORDER-DETAILS. The keyed access retrieves exactly those records that would have been obtained by the sort and join.

  When each record of ORDERS has been read, and all the corresponding entries in ORDER-DETAILS and PRODUCTS retrieved, workfile WORK002 is sorted on CUSTOMER-NO.
- In the third access block, BRW joins WORK001 and WORK002 on CUSTOMER-NO, and writes the resulting records to WORK003. This is the final access table, and is sorted on the sort items you defined on the Define Breaks screen, that is on SALES-AREA, CUSTOMER-NO, and ORDER-NO.
- In the fourth access block, BRW reads the final access table, and processes and prints the report.

Why Does the Third Report Execute Faster?

You can see that the number of access blocks and workfiles has been reduced, and the report executes significantly faster, even with a small example database like TOYDB. This is because, using keyed access:

- You avoided reading the entire PRODUCTS and ORDER-DETAILS data sets; you just extracted the records you wanted.
- You avoided writing two workfiles for the data sets PRODUCTS and ORDER-DETAILS.
- You avoided sorting the two workfiles for the data sets PRODUCTS and ORDER-DETAILS.
- You avoided the join operations joining ORDERS with ORDER-DETAILS, and ORDERS/ORDER-DETAILS with PRODUCTS.

You avoided four entire access blocks and four workfiles. Note how easy it is to see where the time is taken, and to demonstrate the performance improvements. Because the execution statistics are so detailed, it is very easy to experiment with **access methods**, and very easy to use different access methods using the Tune Access screen.

Performance Summary

Performance tips are listed in the Performance Considerations chapter of the *HP ALLBASE/BRW Reference Manual*. Many other useful examples of keyed access are also shown in the Defining Data Access chapter of the *HP ALLBASE/BRW Reference Manual*.

There are too many variables involved in report production to provide a hard and fast rule for the most efficient specification of a report. However, you can use the following general guidelines:

- Keyed access is generally more efficient than serial if a subset ($< 30\%$) of data is selected.
- Reduce data as early as possible in the process.
- Reduce the number of physical block transfers to and from discs.
- Reduce the number of head movements on discs through efficient access.

LESSON 4: Quiz 6

Please answer the following questions. The solutions to these questions are supplied in Appendix A.

1. What is the default access sequence and method?

2. Is it necessary to know about Image databases/KSAM files: (a) Before using BRW? (b) Before tuning BRW reports?

3. Where could you find out when BRW makes a data selection?

4. Where could you find out how much time a report took to run?

5. From the listings: (a) What is the approximate difference in cpu time between lessons 3 and 4? (b) What is the approximate difference in elapsed time between the two tasks?

A

Answers to Quiz Questions

Lesson 1: Quiz 1

1. What is the name of the sample database you will use for this tutorial?

   The sample database is TOYDB.

2. Where is the sample database located?

   In the PUB group of the ITF3000 account, unless you or your database administrator/system manager have changed it. If you have changed the location of TOYDB, write it's new location here:

3. What is the name of the data dictionary you will use for the sample database?

   BRWDIC

4. Is the data dictionary located in the PUB group of the account where your data resides?

   There should be a copy of BRWDIC in the PUB group of the account where you data resides. If not, copy BRWDIC.PUB.IF3000 into your account. If this is not possible, you can recreate the BRWDIC for TOYDB by generating a user-defined dictionary as described in Chapter 18 of the *HP ALLBASE/4GL Reference Manual*. (Be sure that the manual contains the updated pages beginning with 18-51—dated 5/92.)

5. Are there any special login or connection instructions you need to know for your MPE system?

   Write any special instructions here. Your system administrator or database manager can help you if you do not know how to login or connect to the MPE system.

Lesson 2: Quiz 1

1. How many sorts can you have in a report?

   You can have up to 9 sort levels in a report, that is up to 9 sort items.

2. How many break levels can you have in a report?

   You can have up to 9 break levels in a report, that is, a break on each sort item, up to the maximum of 9 sort items.

3. What total will be printed on the break footing on SALES-AREA?

   The total sales in the month for each sales area will be printed on the break footing for item SALES-AREA. (This will be the total of the values of item TURNOVER-MTD for each customer in the sales area).

4. "When creating a report, it is best to go directly to BRW without roughing out a plan for the report." Is this statement true or false? Why is it true or false?

   False. You should have a rough plan for a report before you start to create it.

5. What data will be printed on the Detail lineset in this report?

   The customer number, name and month's sales. That is, the value of the items CUSTOMER-NO. CUSTOMER-NAME, and TURNOVER-MTD in each record.

Lesson 2: Quiz 2

1. What is the final access table?

   The final access table is a table of data records which are used in the report.

2. How many final access tables can you have in a report?

   One. You can create a series of tables, that builds to a final access table, but there must be one, and only one, final access table that is used for the report.

3. Can you use a data item that is not projected from a final access table in a report?

   No. To use a data item in a report, it must be projected from the final access table.

Lesson 2: Quiz 3

1. If you sort on three sort items, how many break levels can you have?

   Up to three break levels, one for each sort item. Note that this does not include breaks for page and report.

2. What is meant by a sort level and order of 4D?

   It means that the item is the fourth sort level, and that the item will be sorted in descending order.

3. If you define two sort items, what is the maximum number of linesets possible in your report?

   Nine. A report heading and footing lineset, a page heading and footing lineset, a detail lineset, and two break heading and footing linesets: one for each sort item.

4. With two sort items, what is the minimum number of possible linesets?

   One. Just the detail lineset. Note that you do not have to define linesets for each sort item (or even for a new page). In fact, you could have no linesets at all: in this case the report would print nothing.

Lesson 2: Quiz 4

1. If you specify the standard item DATE in a lineset, what is printed when the report is run?

   BRW prints the date when the report is run. The date is the current HP3000 system date. The appearance of the item depends upon its edit mask.

2. What screen is used to alter the appearance (edit mask) of an item?

   The Item Edits screen. You can go to the Item Edits screen from the Define Lines screen.

3. What happens if you specify a > character in the Pos field for an item?

   The item is automatically positioned. That is, it is placed two spaces after the last item or literal on the line.

4. If you specify TOTAL in the ColCalc field for an item in the Report Footing lineset, what is printed when the report is run?

   BRW takes the value from each occurrence of that item, totals these values, and prints the total. The total of all the values of that item is printed.

5. What other calculations are possible using the ColCalc field?

You can obtain the average (AVG), the minimum value (MIN), the maximum value (MAX), or the number of times the item occurred (COUNT).

Lesson 2: Quiz 5

1. What files must you specify when you compile a report?

   When you compile a report, you must specify the name of the report specification file and of the report execution file on the Compile Report screen.

2. How would you obtain a printed copy of a compilation error?

   By pressing the `Print Complist` function key on the Compile Report screen.

3. How could you set the output priority of the printed report?

   By typing a number in the Output Priority field on the Request Report screen. The highest priority is 13, the lowest is 0.

4. If you specify `DISC` in the Print Device field of the Request Report screen, what happens to the report?

   The report is printed to a disk file.

5. In the case of the above question, must you give the report a new Print File Name, and, if so, why?

   Yes, because the the disk file and the report execution file must have different names. You could, of course, have the same name for both execution and disk files, if they were saved in different groups.

Lesson 3: Quiz 1

1. Name the three ways in which you can manipulate tables in BRW.

   Join, Open Join, and Merge.

2. If you join two or more tables with the common item ORDER-NO, when is record written to the result table?

   A record is written to the result table whenever an identical value for ORDER-NO appears in every table.

3. What happens if you do not define a relation when joining tables?

   BRWjoins each record of one table with each record in the others. (A Cartesian product.) For example, if you have 1,000,000 records in one table and 500,000 in another, your result table would contain 500,000,000,000 records.

4. What is the effect of defining the following relation condition?

   ```
   MONTH_OF (SHIPMENT-DATE) = 12
   ```

   A record will only be written to the result table if SHIPMENT-DATE is December (12th month).

5. How can you make sure that an item that is present in a data set is not available for use in a report?

   By excluding the item from projection on the Project Items screen. Only items projected from a table (that is, with a X in the Project field) can be used in a report.

6. Is QUANTITY = 0 the same as QUANTITY = NO_VALUE? If not, why not?

   No. QUANTITY = 0 means that a value for item QUANTITY exists, and that value is 0. QUANTITY = NO_VALUE means that a there is no value for item QUANTITY, that is, a value for QUANTITY does not exist.

Lesson 3: Quiz 2

1. How would you specify printing a new page after the footing for break on CUSTOMER-NO?

   By specifying (on the Define Breaks screen) an "A" in the Paging field for the footing for CUSTOMER-NO.

2. How would you make sure that the Detail lineset was only printed when the item ORDER-NO was equal to ORD-011?

   By specifying a Suppress Lineset condition for the Detail lineset of:

   ```
   NOT ORDER-NO = "ORD-011"
   ```

   Note that the lineset is suppressed when the condition is true.

3. How would you specify printing a new page before each sales area without resetting the page number?

   By specifying a "B" in the Paging field of the heading for SALES-AREA.

Lesson 3: Quiz 3

1. What are the differences between Suppress Line and Suppress Lineset?

   You suppress a line from the Define Lines screen; one line only is suppressed. You suppress a lineset from the Define Breaks screen; an entire lineset is suppressed. See the *HP ALLBASE/BRW Reference Manual* for more details.

2. When is a layout calculated item calculated? And when is a table calculated item calculated?

   By default, a layout calculated item is calculated when the report is formatted. It is calculated once for each detail line, (that is, once for each record in the final access table). You can have a layout calculated item calculated only for a particular lineset by specifying CALC in the item's ColCalc field on that lineset. See the *HP ALLBASE/BRW Reference Manual* for more details.

   A table calculated item is calculated when the table in which is defined is built. The item is calculated once for each row of the table.

3. Can you sort and break on a layout calculated item? If not, why not?

   No. Because layout calculated items are calculated when the report is formatted, that is, AFTER the final access table is built and sorted.

4. Once defined, can you use a layout calculated item in a formula?

   Yes. Once created, all calculated items behave exactly like items from data sets or files and can be printed and used in formulas.

5. If the ColCalc field for item TURNOVER-MTD on a break footing shows AVG, what will BRW calculate and print for that item?

   The average TURNOVER-MTD in that break. That is, the total of the values of TURNOVER-MTD in the break divided by the number of values.

6. What will BRW calculate and print if the ColCalc field in the above question showed AVG 1,2?

   The average of the values of TURNOVER-MTD in the level 1 break. However, the values would be taken from the second level break, not the detail line, as the source level is 2.

Lesson 3: Quiz 4

1. Can you supply a password for the report execution file?

   Yes. You specify the password in the Password field on the Compile Report screen. (The password becomes the execution file's lockword).

2. If an item projected from a table = NO_VALUE, what does that indicate about the relational operation on that table?

   It indicates either: that the relational table operation was an Open Join or a Merge; that a previous table in a series of tables included an Open Join or a Merge; or that the formula of a table calculated item set that item to NO_VALUE.

3. Can you use the final access table from another report? If so, how do you specify using another report's access?

   Yes. By entering the name of the report specification file in the Use Access of Report field on the Define Report screen.

Lesson 4: Quiz 1

1. What is the maximum number of source tables that can be joined to form a table?

   You can join up to 16 source tables on one screen. You can also have an unlimited series of tables. That is, you can join 16 source tables into an intermediate table, and then join that intermediate table with another 15 source tables, and so on.

2. If you specify the source tables CUSTOMERS and INVOICES, in that order, on the Define Tables screen, what will be the default access sequence?

   CUSTOMERS and then INVOICES.

3. Can you change the above access sequence?

   Yes, you can alter the access sequence using the Access Sequence field on the Tune Access screen.

4. What happens if you try to use an item for keyed access when that item is not a key item in the data set?

   BRW highlights the field (on the Tune Access screen) and informs you that the item is not a key in that data set.

5. "You can have no more than one relation condition *per relation* in a joined table." True or False?

   False. You can have only one relation condition in a joined table. However, this condition can be as elaborate as you wish. You can have any number of relations in a joined table.

6. Apart from Access Sequence and Key, what other fields are available on the Tune Access screen?

   The Lock Mode field, which allows you to specify whether to lock data sets and how to lock them, and the Open Mode field, which allows you to specify a database open mode other than the default (5).

Lesson 4: Quiz 2

1. How many selection sets and parameters can you have in a report?

   You can have up to 50 parameters and up to 50 selection sets for one report. If you want further selection sets, just copy the report, delete a few sets and define new ones to the limit of 50.

2. What is the difference between the *parameter result* (or *data*) *type* and the *type of parameter*?

   The parameter result is the data type of the parameter, that is, either String (S), Date (D), Time (T), Real (R), Integer (I), or Numeric (N). The type of parameter is either Single-value (S), List-of-values (L), or Comparison Predicate (P).

3. "The main difference between a relation condition and a selection condition is that the relation condition is evaluated earlier and so is more efficient." True or False?

   False. There is no difference in efficiency; both conditions are evaluated as early as possible. The only difference between relation and selection conditions is that relation conditions always apply to a report, and selection conditions apply only if the report is compiled with the appropriate selection set.

4. "Unless you include a parameter in a selection set and compile the report with that selection set, you cannot give a value for that parameter at run time." True or False?

   True. You must include the parameter in the selection set and then compile the selection set with report.

5. "You can use any operator with a comparison predicate parameter." True or False?

   False. Comparison predicate parameters can only be used in formulas with the operator SATISFIES (and the logical operator NOT). You can supply any arithmetic operator and value at run time for a comparison predicate parameter, but in the formula, only SATISFIES can be used.

Lesson 4: Quiz 3

1. Assuming a page length of 60, and that the break footing on CUSTOMER-NO has 5 lines, what would happen to the page footing lineset if you positioned the break footing for CUSTOMER-NO on line 56?

   The page footing would be suppressed whenever the break footing for CUSTOMER-NO is printed, because if a lineset overlaps the page heading or footing, the page heading or footing is suppressed.

2. How can you reserve space for a lineset whether or not that lineset is printed?

   By reserving the space. Type `R` after the line number in the Abs field for that lineset. Note: reserving space only affects other linesets that are not absolutely positioned.

3. What happens when you absolutely position the break footing for CUSTOMER-NO and the break footing for SALES-AREA on the same line?

   If both breaks occur, the second one is printed on the given line position on the next page.

Lesson 4: Quiz 4

1. From where does BRW take the value of standard item REPORT-DESCRIPT?

   From the Report Description field on the Define Report screen.

2. How could you specify that a negative value for an item be printed in parentheses?

   Specify `(` in the negative Prefix field, and `)` in the negative Suffix field. Specify `X` in the Adjust fields for both prefix and suffix.

3. "If you define TURNOVER-MTD on the Item Edits screen with Scaling = 0, Decimals = 0, and Rounding = T, you will truncate item TURNOVER-MTD so that it has no decimals." True or False?

   True, but only for that printing at that position. The actual value of the item is not affected by the edit mask.

4. Explain the difference between Item Edits and NumPrec.

   Item Edits affects how the item will look when printed. NumPrec affects the actual item (for example, when used in calculations).

5. How could you print the item ORDER-NO with a space between each letter? (That is, "ORD-011" is printed "O R D - 0 1 1").

   Specify an edit mask for ORDER-NO of: `X X X X X X X X`

6. Could you also print item ORDER-NO without the above edit mask (that is, without spaces between each letter): (a) In the same report? (b) In the same lineset? (c) On the same line?

   a. Yes

   b. Yes

   c. Yes. A certain edit mask affects only how an item will be printed at a certain position in a certain line. You can position an item many times, and each position can have a different edit mask.

Lesson 4: Quiz 5

1. If you have a report with five different selection sets, and you compile the report with each set: (a) How many execution files will you have? (b) How many specification files will you have?

   a. Five.

   b. One.

2. Can you request a report containing a "required" parameter without supplying a value for that parameter?

   No. If a parameter is required, you must supply a value for it.

3. What will happen if a sales manager, when requesting the report execution file SALESMAN.BRWEXEC, enters a value of "HELLO MOTHER!" for parameter AREA?

   The report will run, but it will not select any data, because there are no records that satisfy the selection condition:

   ```
   (SALES-AREA = "HELLO MOTHER!")
   ```

   Note that BRW can make sure that you enter a parameter of the correct result type (Real, Integer, and so on) and of the correct type of parameter (List-of-Values, and so on). BRW can make sure that any string value does not exceed the maximum length of a string parameter. BRW can make sure that a value is given for a required parameter. Note: BRW cannot check for "sensible" parameter values or typographical errors in parameter values.

4. Must you allow one report to finish before requesting another? If not, how many reports can be requested at one time?

   No. The number of reports that can be requested depends entirely on the number of concurrent jobs your HP3000 allows. BRW streams a job for each report. (This is why you can request more than one report at a time, and why it is currently impossible to check for incorrect parameter values on the Request Report screen.)

Lesson 4: Quiz 6

1. What is the default access sequence and method?

   The default access sequence is the order of the source tables on the Define Table screen, and the default access method is serial read.

2. Is it necessary to know about Image databases/KSAM files: (a) Before using BRW? (b) Before tuning BRW reports?

   a. No. By default, BRW considers each data set, file or KSAM file to be a serial file of records.

   b. Of course, when tuning reports using databases and KSAM files it is better to understand the most efficient ways of retrieving records; so one must understand keys and keyed access.

3. Where could you find out when BRW makes a data selection?

   From the compile listing, under `TABLE CALCULATIONS AND SELECTION`.

4. Where could you find out how much time a report took to run?

   From the execution listing, under cpu-sec and elapsed-sec.

5. From the listings: (a) What is the approximate difference in cpu time between lessons 2 and 3? (b) What is the approximate difference in elapsed time between the two tasks?

   a. 0.525 seconds (Report 3 is approximately 26% faster.)

   b. 1.32 seconds (Report 3 is approximately 27% faster.)

B

Managing the BRW Tutorial

Managing the Tutorial

This appendix describes the account, groups, and files used with the tutorial in this manual. It describes how the tutorial is set up and gives hints on how to manage the tutorial if many students wish to use the tutorial at the same time.

Who Should Read This Appendix?

The person who reads this should be familiar with the HP3000, and, ideally, familiar with BRW. No special knowledge is assumed for those who *take* the tutorial.

Store the Tutorial Files

Before performing the tutorial for the second time, store the tutorial files so that you have a clean copy of them. Store the fileset:

```
@.@.ITF3000
```

Then, if a student corrupts a file, you can restore it from your store tape. The tutorial files use approximately 0.4Mb.

How the Tutorial is Set Up

The tutorial files is set up automatically when the MIT tape is installed. The tutorial files are held in account ITF3000. Four groups are used for the tutorial files:

- PUB.ITF3000. This group contains the database TOYDB and the BRWDIC file.
- BRWSPEC.ITF3000. This group contains the specification files of the three example solutions: SOLUTN1, SOLUTN2, and SOLUTN3.
- BRWEXEC.ITF3000. This group contains the execution files of the example solutions: SOLUTN1, SOLUTN2, SOL3DIR, and SOL3SMN. These are in native mode.
- This group holds the printfiles (example printouts directed to a disk file) for the example solutions: SOLUTN1, SOLUTN2, SOL3DIR1, SOL3DIR2, SOL3SMN1, SOL3SMN2, and SOL3SMN3.

See also “Tutorial Files”.

Other Changes to Account ITF3000

The tutorial installation does not otherwise affect account ITF3000, that is, no passwords are set and no new users are added. The files' and database's creator is MGR.

You can add users or passwords to the account ITF3000, and to its groups and users, but see "Default User".

Note that account ITF3000 can be used by other training courses, for example, LearnDESK (the HPDESK training).

Default User

The tutorial assumes that there is only one student running the tutorial at a time, and that this student has logged on as follows:

```
: HELLO MGR.ITF3000,BRWSPEC
```

That is, the student will work in group BRWSPEC, as user MGR. Whenever prompts for user, group, and account are shown in the text, the appropriate entries are: user MGR, in group BRWSPEC, and account ITF3000.

If the student does not log on as MGR, the actual prompts may differ slightly from the printed examples.

Managing Multiple Users of the Tutorial

The tutorial assumes that there is only one student running the tutorial at a time. More than one student can run the tutorial, however, this may cause problems. For example, if two students wish to run report 2, only one of them, can create a specification file called CUSTREP2.BRWSPEC.ITF3000. The following are some suggestions for handling multiple users of the tutorial.

- Arrange for each new student to use different file names, perhaps by replacing the second four letters of each report ("CUST") with their initials. Note that these new filenames will then appear in on-screen in place of CUSTREP1, CUSTREP2, and so on.
- Restore the tutorial files in other accounts on the same system. Then, tell the student using that other account to use the account's name whenever instructed by the tutorial to use account ITF3000.

Managing Students' Files

Once a lesson has been completed, delete the specification and execution files so that later students can use the same filenames.

Tutorial Files

The following files are supplied with the tutorial.

Example Solutions

There are three example solutions, one for each task. Specification files, execution files, and printfiles (examples of printed output directed to disk files) are supplied for each task.

Specification Solutions

The specification file solutions are:

Table B-1. Specification Solution Files

`SOLUTN1`	Solution to the first report.
`SOLUTN2`	Solution to the second report.
`SOLUTN3`	Solution to the third report.

These files are held in group BRWSPEC.ITF3000.

Execution Solutions

The native mode execution files are:

Table B-2. Execution Solution Files

`SOLUTN1`	Solution to the first report.
`SOLUTN2`	Solution to the second report
`SOL3DIR`	Solution to the third report. (Specification file SOLUTN3 compiled with selection set DIRECTORS.)
`SOL3SMN`	Solution to the third report. (Specification file SOLUTN3 compiled with selection set SALES-MANAGERS.)

These files are held in group BRWEXEC.ITF3000.

Printfile Solutions

The printfiles are:

Table B-3. Printfile Solution Files

`SOLUTN1`	Solution to the first report.
`SOLUTN2`	Solution to the second report.
`SOL3DIR1`	Solution to the third report. (Execution file SOL3DIR run without data restriction.)
`SOL3DIR2`	Solution to the third report. (Execution file SOL3DIR run with parameter CUSTOMER-NO > "000002".)
`SOL3SMN1`	Solution to the third report. (Execution file SOL3SMN run with parameter AREA = "WESTERN".)
`SOL3SMN2`	Solution to the third report. (Execution file SOL3SMN run with parameter AREA = "WESTERN" and CUSTOMER-NO > "000002".)
`SOL3SMN3`	Solution to the third report. (Execution file SOL3SMN run with parameter AREA = "WESTERN" and CUSTOMER-NO = "000006".)

These files are held in group BRWONLNE.ITF3000.

BRWDIC File

This is the BRWDIC file that describes the TOYDB. You do not need a data dictionary to run the tutorial. See the *HP ALLBASE/BRW Reference Manual* for a description of data dictionaries and the BRWDIC file. The BRWDIC file is called BRWDIC, and is held in group PUB.ITF3000.

Database TOYDB

This is a HP TurboIMAGE/iX database, with six data sets containing the following records:

CUSTOMERS	8 records
ORDER-MASTER	10 records
ORDERS	11 records
PRODUCTS	10 records
INVOICES	1 record
ORDER-DETAILS	10 records

INVOICES and ORDER-MASTER are not used in the tutorial examples. The data sets are:

TOYDB (root file), TOYDB01, TOYDB02, TOYDB03, TOYDB04, TOYDB05, and TOYDB06. They are held in group PUB.ITF3000.

There are no passwords or access restrictions to the TOYDB database.

The database creator is MGR.

Amending the TOYDB

You can add or amend records in the TOYDB, for example using QUERY, but if you do so, you can spoil the output of the task reports. Therefore, if you wish to add or amend records, please copy the TOYDB and work on the copy.

Glossary

access block
A unit of data access, when the report is executed. Locks on databases or files are only held during execution of one access block.

Produces an intermediate work file, or if it is the last access block, the final report.

The compile program BRWCOMP splits a table into several access blocks, or combines several tables into one access block, depending on the selected access methods.

access method
Specifies how to retrieve the data, that is, the sequence in which the source tables are to be accessed; the method to be used for each (serial or keyed) and if the source table is to be locked during access.

alias name
Can be given to an item when duplicate item names would otherwise appear in the report. Use the Project Item screen to assign the alias name. Thereafter, when you wanted to refer to that item, you would use the alias name instead of the actual name from the data source.

argument
Provides a value, when an expression is calculated; can be an item, function, parameter, constant, or another expression.

array
Combination of several similar items (called array items or array components) under one name.

break
Occurs when the value of a sort item (or part of it) changes. For each sort level a break heading and break footing lineset can be specified.

break level
The sort level number for the break. For instance, if a break occurs on sort level 1, it is called break level 1.

BRWACCSD
The program used to create a BRWDIC dictionary file from HP Access Central Dictionary.

BRWAPPD
The program used to create an BRWDIC dictionary file from HP Application Dictionary.

BRWCOMP
See *report compile program*.

BRWCONV
See *report conversion program*.

BRWDIC
See *dictionary file*.

BRWD3000
The program used to create a BRWDIC dictionary file from HP Dictionary/V.

BRWEMPTY
Program used to clear intermediate report files. Filename BRWMPTY.PUB.SYS

BRWEXEC
See *report execution program*.

BRWGEND
The program used to create a BRWDIC dictionary file from a user-generated file containing dictionary statements.

BRWLIST
See *report list program*.

BRWSD
The program used to create a BRWDIC dictionary file from HP System Dictionary.

BRWSETUP
See *configuration program*.

BRWSTART
See *report request program*.

calculated item
Is calculated from other items, parameters or constant values. Provides a single value each time a calculation is performed.

Also called calc item.

calculation formula
An expression which results in a numeric, string, date or time value. The formula of a calculated item or a function.

calculation language
BRW has a powerful calculation language that allows you to perform simple and complex arithmetic operations. Operations can be performed on numeric data, string values, and date and time figures. The calculation language allows nested operations, conditional execution, **array** calculations, and string manipulation. You can also define your own functions or use the predefined functions supplied with BRW.

column calculations
Vertical calculations, which summarize data for a break, page or report. Can total, average, find a minimum, find a maximum, count or calculate. You can set the source and the reset level for column calculations.

Results of column calculations can be used as arguments within layout calculations or layout functions.

common item
Same item occurs in several source tables. Are used to define relations.

Only records in which each common item has identical values in the source tables will be joined together. Can have different names in the source tables.

Need not be key items, that is, do not have to be HP TurboIMAGE/iX search items or KSAM keys.

compile
The BRW

condition
A formula, which is either true or false, depending on given values. Usually comparisons combined with boolean operators. The formula of a selection condition, relation condition, line or lineset suppress condition.

configuration file
The file name is BRWC000. Contains defaults to be used in RSPEC, configuration for BRWEXEC, and global functions.

BRW looks for the file in the following order:

1. BRWCONF
2. BRWCONF.PUB
3. BRWCONF.PUB.SYS
4. BRWC*nnn*.PUB.SYS, where *nnn* is the number returned by the Native Language Support intrinsics.
5. BRWC000.PUB.SYS

configuration program
Used to configure BRW. The file name is BRWSETUP.PUB.SYS.

DBA
Database Administrator. The individual responsible for the creation and maintenance of HP TurboIMAGE/iX or HP ALLBASE/SQL databases, including granting and revoking access authority.

database
Physical storage of application data. Consists of one or more datasets for an HP TurboIMAGE/iX database, or tables and views for an HP ALLBASE/SQL database. Provides various access methods for use to retrieve data.

database administrator
See *DBA*.

database environment
(DBEnvironment) A collection of files for one or more logical HP ALLBASE/SQL databases.

data dictionary
Central data storage for data definitions. Contains definitions of items, datasets, databases, files, keys, passwords, and so on.

data set
Physical storage of source data in an HP TurboIMAGE/iX database; the two types of data sets are master and detail.

detail
The lineset printed for each record in the final access table.

HP Dictionary/V, HP System Dictionary, HP Application Dictionary, HP Access Central Dictionary, and user-generated dictionaries can be used with BRW. For each account in which BRW is to be used, a dictionary file must be created first by using the programs BRWD3000, BRWSD, BRWAPPD, BRWACCSD, or BRWGEND.

dictionary file
Contains definitions of items, databases, data sets, files of one account. The file name is BRWDIC. BRW can access multiple dictionary files in one report.

dictionary output file
Saves data for later processing. The file code is ROUTD. Data is stored in external form as defined in the data dictionary.

edit mask
An edit mask is a code that describes how an item will print. Each item has a separate edit mask for each time it is defined in a line. That is, if you used DATE five times on the same report or

lineset, each occurrence has a separate edit mask and you could have each of the five dates print in a different form.

exception condition
An exception condition occurs when the value of an item ,function, parameter, or expression is invalid. When an exception condition occurs, BRW issues an execution warning message, which is printed at the end of the report.

execution file
Used to produce the report. The file code is REXNM. Cannot be modified. Contains the report specifications in compiled form, similar to a program file.

expression
A nested formula in parentheses.

file
Physical storage of a source table that is not in a database.

final access table
All the data that BRW needs is copied from the files or databases where it is stored and is built into a table, called the final access table. The final access table contains the data that BRW uses when you run the report.

You cannot define the **report layout** until you supply a final access table. All data items that you want to use in a report must be present in the final access table.

If several tables are nested, the final access table is the table on top of table hierarchy.

footing
Data printed at the bottom of a page, report or after a detail. Lineset for a break, page or report.

Can be used to print column calculations for that break, page or report. Can be used to print data from the previous detail, or previous lineset if it is a page footing.

format
Description of the items of a table (name, type, length, position in record, number of array components). The format of each dataset or file used in a report must have been specified in the dictionary.

The format of intermediate report files is included in these files (self-describing files). They cannot be specified in the dictionary.

formula
Calculated items, functions and conditions are expressed in a formula. The calculation language is used to express formulas.

frozen specification file
Same as specification file, but allows only to be copied, listed or compiled. The file code is RSPCF.

function
An expression frequently used in other formulas. Can have up to nine function arguments.

function argument
A placeholder for an actual expression supplied when the function is used in another formula.

heading
Data printed at the top of a page, report or before a detail. Lineset for a break, page or report. Can be used to print data for the next detail, or the next lineset if it is a page heading. Can print carry forward column calculations from the previous footing of same type.

HP ALLBASE/SQL
Database management system used on the HP3000 that supports the relational data model. SQL = Structured Query Language.

HP ALLBASE/SQL authority
A privilege given to a user to perform specific database operations such as connecting to a DBEnvironment or accessing tables or views. The DBA is responsible for granting and revoking authority.

HP ALLBASE/SQL CONNECT
A command used to access a DBEnvironment. The user must have a CONNECT or DBA authority to the specified DBEnvironment.

HP ALLBASE/SQL query
BRW builds a SELECT command to retrieve data from one or more tables or views. This process of retrieving the data and the command are referred to as an HP ALLBASE/SQL Query.

HP ALLBASE/SQL SELECT
A command that retrieves data from one or more tables or views. The retrieved data is in the form of a table, called the result table or query result.

HP ALLBASE/SQL table
Data in the relational database is organized into a table consisting of rows and columns. A row is a record and a column is an item.

HP ALLBASE/SQL table owner
Within HP ALLBASE/SQL a table or view is accessed by specifying both the owner and table name.

HP ALLBASE/SQL view
A table derived by placing a "window" over one or more tables to let users access only certain data.

HP ALLBASE/SQL system catalog
Contains information on data structures of HP ALLBASE/SQL databases.

HP ALLBASE/SQL autostart mode
An autostart flag is set to determine how the DBEnvironment is opened. It must be set to "on" to allow the CONNECT command that is always used by BRW.

HP ALLBASE/SQL user mode
When set to "multi", more than one user and program can use the DBEnvironment.

HP Application Dictionary
Data dictionary used with HP applications.

HP System Dictionary
Data dictionary used with IMAGE data.

HP TurboIMAGE/iX
Database management system used on the HP3000 that supports the network data model.

intermediate report file
(IRF) Saves data for later reporting. The file code is ROUTI.

Used for reporting on results (exception reporting). Used to optimize production reporting cycles (reduces redundant database access).

Data is stored in BRW internal format.

IMAGE
The term IMAGE is sometimes used to represent both HP IMAGE/3000 and HP TurboIMAGE/iX databases.

item
A column in a table. Can get its values from database, file or from calculations. Can be printed, used for sort or selection, written to an output file, used in calculation formulas. If a calculated item, provides a single value each time the calculation is performed.

item edit
Rule for how an item value is to be formatted for printing.

item types
Are:

S = string
N = fixed point numeric
I = Integer
R = floating point real
D = date
T = time

join
Method of combining source tables in which the columns of two or more tables are joined side-by-side.

KSAM
Keyed sequential access method on the HP3000 system.

KSAM file
Allows sequential and keyed access to the data in the KSAM file. Usually consists of two MPE files: a data file and a key file. However, with MPE/iX Native Mode, KSAM consists of only one MPE file.

BRW supports KSAM files with fixed length records.

layout
The arrangement of the report as it is to be printed.

layout calculated item
A calculated item defined within the report layout. Is calculated when the report is formatted; can be calculated from column calculations; can be printed, written to an output file, or used to calculate other layout calc items. Cannot be used for sort or selection.

Also called layout calc item.

layout functions
Are defined within the report layout; can be used in other formulas defined in the report layout.

Are similar to program subroutines.

line
A printed line on a page; can consist of item values and fixed text.

lineset
A lineset is a group of lines (minimum 1 line, maximum 999 lines) that are treated as a whole and can be printed together. For example: a detail, break, new page, or the beginning or ending of the report. Can consist of a single line of text or items, multiple lines or no lines. Pagination and output file records also relate to a lineset.

You can have a maximum of 9 sort items in a report and up to 23 linesets.

link
See *join*.

lock mode
Used to secure a lock on an IMAGE dataset, HP ALLBASE/SQL, table, KSAM or MPE file. You can specify a lock mode on the BRW Tune Access screen.

merge
Method of combining two similar tables by stacking (appending) one on the other.

MPE XL
Operating system on the HP3000 computer.

MPE file
Sequential file supported by MPE. BRW supports standard MPE files with fixed length records. Special MPE files (RIO, MSG, CIR, and so on) are not supported by BRW.

multi-pass reporting
Execution of a sequence of reports and optional application programs.

numeric precision
Determines the precision of an item's value when it is used in further processing.

Consists of a number and method code. The number indicates the least significant digit of the precision as the 10th exponent of this digit. The method code indicates how superfluous digits are to be treated: rounded (R), truncated (T) or ceiled (C).

open join
Method of combining source tables in which source tables are joined and all records from one source table are reported, even if these have no corresponding records in the other source tables. See also *join*

outer join
See *open join*.

output file
Saves data for later reporting or processing. Can be specified for each lineset; can be an intermediate report file or a dictionary output file.

page
A page of the printed report. Page heading and footing linesets can be defined to be printed on each page.

Other linesets can be printed as they are, or they can be positioned at an absolute position of the page.

page heading
The lines that are printed at the top of a new page, normally the page number, date, report title, and so on, are called the page heading lineset. BRW prints the page heading lineset (unless you use a **suppress condition**) at the top of each page of the report.

pagination
The control of the page layout. A new page can be specified before or after a lineset; or, a lineset can be split if it does not fit completely on rest of page. A lineset can be positioned absolute on a page.

parameter
A constant which gets its value at report execution time and which makes data selection for a report more flexible.

parameter types
Are:

P = comparison predicate
S = single value
L = list of values

positioned item
Positioned by line number within lineset, position within line, and length. Not all items in the report layout need to be positioned (printed), for example, sorts or column calculations do not require printing.

print field
The space in a lineset in which the value of an item is printed. Specified by line number within lineset, position within line, and length. The item values can be formatted using item edits before they are printed in the print field.

print file
Contains the printed report; can be a spool file, a device file or a permanent file on disk. The file code is PRINT. Has fixed length records and can be either CCTL or NOCCTL.

report footing
The total turnover for all the customers in all sales areas. This is printed at the end of the report.

projected items
When source tables are combined, their items are projected to the newly formed table. A projected item can be given an alias name, excluded from projection, and given numeric precision; these attributes are only in effect *outside* the item's source table.

record
A row in a table. Each record in the final access table will be printed as one detail lineset.

record number
See *TABLE-REC-NUMBER*.

referenced access file
A report specification file that contains access definitions used by another report.

relation
Defines the rules for joining source tables; does *not* specify the access method to be used to retrieve the data.

relation condition
Selects a subset of records from joined source tables; is defined within a table.

Uses the calculation language.

report
Data printed on paper or to disk. Can also mean the definition of the report (report layout, data access, calculations to be used to create the report, and so on).

report compile program
Used to compile a report. The file name is BRWCOMP.PUB.SYS. Can be used stand-alone or within the report specification program.

report conversion program
Used to convert Report/V and Inform/V reports to BRW specification files. The filename is BRWCONV.PUB.SYS.

report execution program
Used to produce a report. The file name is BRWEXEC.PUB.SYS. Can be used stand-alone or within the report specification program.

report job file
For producing multi-pass reports; used for bundling the production of multiple reports. Is created using HP EDITOR/3000 or any compatible editor; the optional file code is RJOB.

report layout
The way the report looks in its final form, after all calculations have been performed, rows and columns have been placed on the page, and so on.

report list program
Used to list the specifications of a report. The file name is BRWLIST.PUB.SYS. Can be used stand-alone or within the report specification program.

report request program
A program used to request BRW reports. The filename is BRWSTART.PUB.SYS. Can be used stand-alone.

report specification program
To specify, list, compile, and execute a report. The filename is BRWXL.PUB.SYS. Invokes the report compile, execution, and list programs.

result table
A table that is formed by BRW by accessing one or more datasets, tables, or files. The result table used for the report layout is called the final access table.

root source table
First source table in a sequence of joins with keyed access.

row calculation
Calculations using layout calculated items; specified by adding a calculated item to a report and then defining a formula for that item.

sample layout
A picture of the report layout, in which the print fields are shown as X's or 9's for numeric fields. X's and 9's can be changed with the program BRWSETUP.PUB.SYS.

selection
Selects a subset of the data in the final access table.

selection condition
Criteria to select a subset of data from the final access table. Is expressed as a condition formula and uses the calculation language. Can be flexible by using parameters.

selection criteria
Control the amount of data which goes into a report, as well as when and how the report is printed.

selection set
One group of data selection criteria used for a report. Multiple selection sets can be defined in a specification file, but the report must be compiled once for each selection set. Allows

data-dependent security. Can contain default values for parameters, print file and report schedule.

serial file
MPE file format.

sort
Arranging items on the report by ascending or descending order, alphabetically or numerically.

sort item
An item that is used as the basis for a sort. For example, if the report is sorted by the customer name, then the CUSTOMER-NAME item is a sort item. A report can be sorted by up to nine items; each item in ascending or descending order.

source table
Can be an IMAGE dataset, an HP ALLBASE/SQL table, a MPE, KSAM or IRF file or an BRW table defined in the report.

specification file
Used for creation and modification of a report. The file code is RSPEC. Must be compiled into an execution file to produce the report. Contains the report specifications.

standard functions
Predefined functions supplied by BRW.

standard items
Predefined items supplied by BRW. A list of standard items is supplied in Chapter 15 of the *HP ALLBASE/BRW Reference Manual*.

standard job file
Used as report job file, when a single report is started in batch. The file name is BRWJ000.

BRW looks for the file in the order below:

1. BRWJOB
2. BRWJOB.PUB
3. BRWJOB.PUB.SYS
4. BRWJ*nnn*.PUB.SYS, where *nnn* is the number returned by the Native Language Support intrinsics.
5. BRWJ000.PUB.SYS

The standard job file can be modified using HP EDITOR/3000 or any compatible editor.

suppress condition
Criteria to suppress printing of a line or lineset; can be specified for each line or lineset. Is expressed as a condition formula and uses the calculation language.

syntax diagram
Describes the syntax of the BRW calculation language in a graphic form.

table
A collection of data in which the rows are records and the columns are items. Basis for the report layout or other tables; joins or merges the source tables. Tables can be nested, thus can consist of other tables as source tables.

table calculated item
Is a calculated item defined within a table. After it is projected from that table, it becomes a normal item. Is calculated when the data is retrieved. Can be printed, used for sort and projection, written to an output file, used to calculate other items.

Also called table calc item.

table function
Defined for a table. Can be used in other formulas defined in the same table. Similar to a program subroutine.

TABLE-REC-NUMBER
The logical record number defined by BRW. Source tables that are IMAGE data sets, KSAM files, or MPE files always have the item TABLE-REC-NUMBER included in the result table, HP ALLBASE/SQL tables do not.

text
Fixed text printed on a line.

transaction isolation level
Applies to HP ALLBASE/SQL databases. Is the level of concurrent access that is allowed during a transaction.

transaction priority
Applies to HP ALLBASE/SQL databases. Is an integer from 0 to 255 specifying the priority of a transaction. The transaction with the largest priority number is aborted to remove a deadlock.

value
A value in the mathematical sense. Each record contains one value per item.

VPLUS
User interface system on the HP3000 system. Used in the report specification program.

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