

## Chapter 10

### **Soup To Nuts Database Reporting**

All database reporting tools, including R&R, require a set of data tables to access or they serve no purpose. I often tell people attending my training classes that if R&R was the only program on their computers it would be useless.

We store information in tables because it is a convenient, highly structured way to record history and categorize things. This is, of course, not the only way to keep track of our daily activities. Many people write a narrative journal or produce copious amounts of correspondence, and historians routinely look to these types of sources when performing research. Yet the structure data tables instill upon information allows more efficient, thorough and conclusive knowledge gathering than narrative record keeping. For this reason, civic, cleric, and other organized documentation of events and people is highly prized for scholarly work. This type of information is not nearly as colorful, nor as interesting, as reading someone's letters.

Scientific research, at least since the Enlightenment, has been built upon structured record keeping. I easily recall numerous television programs about the history of scientific discovery that insert images of the scientists' observation journals — with page after page of columns of data (sound familiar?) — from which the scientists proved

something that changed the world. In each case the famous scientist *must* have done some database reporting to prove his or her theory.

## This Table Is Your Table

So each of us has data tables. The reasons we maintain them are as varied as the type of work each of us does. We need reports from them because buried within them are the answers we want. Is there a scientific method to extract these answers? Yes.

In Volume One I introduced the importance of the report's *purpose*. We extract information from our tables because we want that information for a reason. I emphasized that these reasons must be some combination of our desire to:

- 1) *do* something with the information. (Administration)
- 2) *say* something with the information. (Communication)
- 3) *learn* something from the information. (Analysis)

Whatever the purpose category, once we have defined the reason we need the information, the process we follow is the same. This book can not address everybody's specific purpose. Indeed, the book will not exemplify *anybody's* actual purpose. If it did so, it would not be able to serve those with a very different purpose in mind. Instead, this volume will present many classes of commonly experienced report purposes. From these examples I hope each reader will be able to find the parallels to his or her own purpose. Then, by observing the techniques described here, the reader should be able to create the report format that addresses his or her specific purpose.

Through the examples, a student of reporting will eventually discover that the process we follow for all reports is the same. Once we have defined the purpose, we endeavor to:

- 1) translate the stated report purpose into its resolvable components.
- 2) generate the composite database to resolve the purpose.
- 3) present the solution by placing the composite table's contents based upon the behavior of each of the seven categories of report bands.

These three processes encompass the scientific method of database

reporting. If you can learn to apply these concepts, you will be able to produce any report you want with R&R.

## Off To Work

To illustrate the examples in the book — and to give an otherwise bland subject a little spice — we will continue to trace the adventures of Rachel Rubin. Rachel has graduated from Humongous University, with Honors, and has just received a truckload of graduation gifts. One of them happens to be a pickup truck, which came in awfully handy.

Rachel's jealous sister Rhonda was, well, jealous of all the gifts that Rachel received. In an attempt to mollify her sister, Rachel wants to produce a report from the database to compare the value of the gifts each received for high school graduation. Rachel hopes to show Rhonda that nobody was playing favorites.

The data table structures as we specified them as of the end of Volume One are shown in Figure 10-A. This listing constitutes the **data dictionary** for the next several examples.

**Note:** I introduced Rachel and her family in Volume One. For those who never read that book, Rachel turned Sweet 16 and received a computer for her birthday. She was always slow with her thank you notes so her brother, Robert, set up a database for her to keep track of her gifts and TYNs. That was so successful, Rachel's three younger siblings (Rhonda, Richard and Randi) started to use it as well. When Robert married Rebecca Rivers, both families started to use the database.

This story is not simply for color. Understanding the motivations of the characters is central to recognizing the similarity of their purposes to our own.

### *Where's Webster When You Need Him*

*A data dictionary is the most helpful tool (next to these volumes, of course) at your disposal while developing reports in R&R. It is a listing of all of the data tables, by table name and descriptive name, and of each of the data fields stored in each table.*

*The data fields are normally shown with a brief description of the field's contents, the type of data (numeric, character etc.) and the field's size. In addition, some data dictionaries will indicate coded fields and, when applicable, possible values for coded fields and how they translate. Some fields may also be marked as "unique", meaning that each record in the table must have a different value for the field than all other records.*

*Data dictionaries may also describe the index or indexes for the data files. In these cases, the name of the index file and the formula for the key expression will aid the user to link files. Other times, specific data fields may be noted as "key" fields. If the database program uses multiple indexes (as does as FoxPro), the tag names and their key expression will be included.*

*Thorough knowledge of one's data dictionary is a prerequisite for intermediate to advanced reporting.*

The sample data dictionary uses xBase data structures and dBase III index files. Any version of R&R, including SQL and Arpeggio versions, can read these tables.

<b>GIFTPART.DBF</b> (Persons / Couples Sending or Receiving Gifts)			
<u>Field Name</u>	<u>Description</u>	<u>Type</u>	<u>Size</u>
PART_CODE	Gift Participant Code (initials)	Char	4
FNAME	Participant First Name	Char	15
MI	Participant Middle Initial	Char	4
LNAME	Participant Last Name	Char	15
STREET1	Participant's Street Address Line 1	Char	30
STREET2	Participant's Street Address Line 2	Char	30
CITY	Participant's City	Char	15
STATE	Participant's State P.O. Abbreviation	Char	2
ZIP	Participant's (up to) 9 Digit ZIP	Char	10
AREACODE	Participant's Phone Area Code	Char	3
PHONE	Participant's 7-digit phone with dash	Char	8
BIRTH_DT	Participant Birth Date	Date	N/A
SPOUSE_CD	Code for Participant's Spouse	Char	4
GENDER	Either "M"ale or "F"emale	Char	1
<b>Data Table Index</b>			
<b>GIFTPART.NDX</b> — Key Expression: PART_CODE			
<b>GIFTS.DBF</b> (Gifts sent / received)			
<u>Field Name</u>	<u>Description</u>	<u>Type</u>	<u>Size</u>
GIVER_CD	Participant Code for Gift Giver	Char	4
RECIP_CD	Participant Code for Gift Recipient	Char	4
GIFT	Gift Description	Char	40
REC_DATE	Date given/received	Date	N/A
REASON	Reason received	Char	10
VALUE	Value of gift	Num	5.2
TYPE	Gift Category	Char	10
THANKU	Thank you note sent/received	Log	1
THANX_DATE	Date of thank you	Date	N/A
WHEREHOW	Disposition of gift	Char	40
REQUESTED	Whether gift was requested/registered	Log	1
<b>Data Table Indexes</b>			
<b>RGDT.NDX</b> — Key Expression: RECIP_CD+GIVER_CD+DTC(REC_DATE)			
<b>GRDT.NDX</b> — Key Expression: GIVER_CD+RECIP_CD+DTC(REC_DATE)			
<b>TYPEDESC.DBF</b> (Gift Category Codes / Descriptions)			
<u>Field Name</u>	<u>Description</u>	<u>Type</u>	<u>Size</u>
CODE	Gift type code	Char	10
DESCRIP	Gift category description	Char	20
<b>Data Table Index</b>			
<b>TYPEDESC.NDX</b> — Key Expression: CODE			
<b>REASDESC.DBF</b> (Gift Giving Event Codes / Descriptions)			
<u>Field Name</u>	<u>Description</u>	<u>Type</u>	<u>Size</u>
CODE	Gift giving reason code	Char	10
DESCRIP	Gift giving reason description	Char	20
<b>Data Table Index</b>			
<b>REASDESC.NDX</b> — Key Expression: CODE			

Figure 10-A: Data Dictionary for Rubin Family Gift Tracking System.

In Chapter 9 of Volume One I introduced a Guide to developing reports that corresponds to the process described above. An image of this Guide is reproduced as Figure 10-B. The first stage to develop Rachel's report is to define a concise "purpose statement". Before reading on, see if you can define an appropriate purpose statement.

In this case I would phrase it "Compare high school graduation gift values received by Rachel and Rhonda to determine if one sister received more gifts than the other." This is one possible description of the problem to be solved, but it contains all the components of a useful Analysis purpose statement:

- 1) a description of what the report user wishes to learn
- 2) a definition of the type of analysis (i.e., comparison between groups)
- 3) specific nature of the variables subject to the analysis (gift value)
- 4) limitation on the scope of the analysis (just Rachel's and Rhonda's received gifts)

As an exercise, compare the purpose statement you developed to the numbered criteria. If one or more of the four points cannot be addressed by your statement, try your purpose statement again.

Our next step is to reduce the purpose statement into its solvable parts. Once again, the Guide steers us through this phase of the report development process. First we determine what pieces of information we need to fulfill the purpose. Figure 10-C shows the Guide with notations that complete the Contents section. We need to derive a total value for Rachel's and Rhonda's high school graduation gifts and also count how many each received. These figures are not stored in any table, but can be derived by adding the individual gift values — and counting gifts records — that *are* in the table. We also need to identify which totals apply to Rachel and which to Rhonda since the numbers themselves, without knowing which belong to which sister, would not answer our purpose.

## These Are Mine, Those Are Yours

The next solvable component involves how to organize the information. Since we need to derive a total based upon each sister's gifts, we will need to specify a grouping level based upon the sister receiving the gifts. The

Note: The Data Sample Diskette that accompanies Volume Two contains a printable version of the Report Writing Guide. From the MS-DOS prompt, type the command:

```
copy a:lrwguide.prt lpt1: /b
```

This command will print the image in Figure 10-B on any laser printer compatible with HP Series II or later.

## Livewarc® Report Writing Guide®

### Purpose

Statement: \_\_\_\_\_

Administration

Communication

Analysis

Report Name: \_\_\_\_\_

### Contents

Item Description/Field Name	Field	Calc	Total	Item Description/Field Name	Field	Calc	Total
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Organization

Sort Levels	Order (A/D)	Group Levels	Pg Brk
1) _____	_____	1) _____	<input type="checkbox"/>
2) _____	_____	2) _____	<input type="checkbox"/>
3) _____	_____	3) _____	<input type="checkbox"/>
4) _____	_____	4) _____	<input type="checkbox"/>
5) _____	_____	5) _____	<input type="checkbox"/>

### Query

\_\_\_\_\_

### Files

Master Table: \_\_\_\_\_

Related Table: \_\_\_\_\_ Related Table: \_\_\_\_\_

Related Table: \_\_\_\_\_ Related Table: \_\_\_\_\_

### Layout/Sketch

Sketch attached?  Yes  No

Orientation:  Portrait

Landscape

Special Instructions: \_\_\_\_\_

Figure 10-B: Image of Liveware® Report Writing Guide®.

field that holds the gift recipient's code is RECIP\_CD in the GIFTS.DBF table. To ensure that all the gifts for each sister are together when we want R&R to total their values, we also need to sort the database by gift recipient, although which sister is listed first is not important.

**Note:** For a thorough description of how sorting and grouping work in conjunction and independently, refer to Chapter 6 in Volume One.

Figure 10-D shows the completed Organization section of the Guide. While the figure shows the field name, we could substitute a simple description — “gift recipient” — and later translate the phrase to the field that holds this information.

**Liveware+ Report Writing Guide+**

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**Purpose**

Statement: *Compare high school graduation gift values received by Rachel and Rhonda to determine if one sister received more gifts than the other.*

Administration       Communication       Analysis

Report Name: *Rubin Sister's High School Graduation Gift Totals*

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**Contents**

Item Description/Field Name	Field	Calc	Total	Item Description/Field Name	Field	Calc	Total
<i>I.D. Rhonda vs. Rachel</i>		<input checked="" type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>
<i>Value of each sister's gifts</i>		<input type="checkbox"/>	<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>
<i>Count of each sister's gifts</i>		<input type="checkbox"/>	<input checked="" type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>

---

**Organization**

Sort Levels	Order (A/D)	Group Levels	Pg Brk
1) _____	_____	1) _____	<input type="checkbox"/>
2) _____	_____	2) _____	<input type="checkbox"/>
3) _____	_____	3) _____	<input type="checkbox"/>
4) _____	_____	4) _____	<input type="checkbox"/>
5) _____	_____	5) _____	<input type="checkbox"/>

---

**Query**

\_\_\_\_\_

---

**Files**      Master Table: \_\_\_\_\_

Related Table: \_\_\_\_\_      Related Table: \_\_\_\_\_

Related Label: \_\_\_\_\_      Related Label: \_\_\_\_\_

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**Layout/Sketch**      Sketch attached?     Yes     No

Orientator     Portrait     Landscape

Special Instructions: \_\_\_\_\_

The report's purpose statement suggests the pieces of information necessary to address the report's purpose. At this point, we do not need to know how we will acquire that information.

Figure 10-C: Guide with Purpose and Contents sections completed.

One other solvable component remains. Since the data table that holds the information we need also contains records that do not apply to the analysis, we need to limit the data table to only the records we want. The Guide's Query section provides some space for us to specify which records should be included (or excluded). Clearly, if we do not have knowledge of the table's contents, we cannot effectively eliminate unwanted records. Nor can we be sure we have included every record that we need to completely derive Rachel's and Rhonda's gift totals. Therefore, as background and for those who did not review Volume One, the gift data table contains records for gifts given and received for many family members and for many occasions.

**Liveware® Report Writing Guide™**

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**Purpose**

Statement: Compare high school graduation gift values received by Rachel and Rhonda to determine if one sister received more gifts than the other.

Administration       Communication       Analysis

Report Name: Rubin Sister's High School Graduation Gift Totals

---

**Contents**

Item Description/Field Name	Field	Calc	Total	Item Description/Field Name	Field	Calc	Total
<u>TD Rhonda vs. Rachel</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Value of each sister's gifts</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Count of each sister's gifts</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

---

**Organization**

Sort Levels	Order (A/B)	Group Levels	Pg Brk
1) <u>Sister (RECIP_CD)</u>	<u>A</u>	1) <u>Sister (RECIP_CD)</u>	<input type="checkbox"/>
2) _____	_____	2) _____	<input type="checkbox"/>
3) _____	_____	3) _____	<input type="checkbox"/>
4) _____	_____	4) _____	<input type="checkbox"/>
5) _____	_____	5) _____	<input type="checkbox"/>

---

**Query**

\_\_\_\_\_

---

**Files**      Master Table: \_\_\_\_\_

Related Table: \_\_\_\_\_      Related Table: \_\_\_\_\_

Related Table: \_\_\_\_\_      Related Table: \_\_\_\_\_

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**Layout/Sketch**      Sketch attached?     Yes     No

Orientation:     Portrait     Landscape

Special instructions: \_\_\_\_\_

The purpose statement also projects the necessary sorting and grouping levels needed to derive and arrange the information cogently.

Figure 10-D Guide with completed Organization section.



**Liveware® Report Writing Guide®**

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**Purpose**

Statement: Compare High School graduation gift values received by Rachel and Rhonda to determine if one sister received more gifts than the other.

Administration     Communication     Analysis

Report Name: Rubin Sister's High School Graduation Gift Totals

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**Contents**

Item Description/Field Name	Field	Calc	Total	Item Description/Field Name	Field	Calc	Total
<u>F.O. Rhonda vs Rachel</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Value of each sister's gifts</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Count of each sister's gifts</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

---

**Organization**

Suit Levels	Order (AND)	Group Levels	Pg Brk
1) <u>Sister (RECIP.CO)</u>	<u>A</u>	1) <u>Sister (RECIP.CO)</u>	<input type="checkbox"/>
2) _____	_____	2) _____	<input type="checkbox"/>
3) _____	_____	3) _____	<input type="checkbox"/>
4) _____	_____	4) _____	<input type="checkbox"/>
5) _____	_____	5) _____	<input type="checkbox"/>

---

**Query**

1) RECIP.CO in the list "RHONDA", "RACHEL"

2) (AND) REASON equals "HS GRAD"

---

**Files**                      Master Table: \_\_\_\_\_

Related Table: \_\_\_\_\_      Related Table: \_\_\_\_\_

Related Table: \_\_\_\_\_      Related Table: \_\_\_\_\_

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**Layout/Sketch**                      Sketch attached?     Yes     No

Orientation:     Portrait     Landscape

Special Instructions: \_\_\_\_\_

Language in the purpose statement should describe the primary query elements for the report. The report title often specifies these parameters, as in "Monthly Summary".

Figure 10-E: Guide with complete Query section.

Record keeping began with Rachel's Sweet 16 gifts (pre-high school graduation) and no records have been removed.

Figure 10-E displays the Guide once the Query section has been completed. As with the Organization section, we used field names, though we could have used descriptive phrases. The Query section indicates that the report will include only records where:

1) “RACHEL” or “RHONDA” is the gift’s recipient; as opposed to gifts they had given or gifts received by anyone else.

2) The reason for the gift was high school graduation (code HSGRAD).

Each record in the table must meet BOTH criteria. Meeting just one or the other would invalidate the analysis.

**Note:** Many examples in this volume will require several data tables to fulfill the report’s purpose, but not the current example. When the Contents, Organization and Query sections specify fields from more than one data table, the decision as to which table is the Master table becomes more complex. For more information on this topic, refer to Appendix B in Volume One, and the subject index in the back of Volumes One and Two under the heading “Master Table, Selecting”.

The Guide’s next section lets us list the data files in which we will find the fields we need to fulfill the Contents, Organization and Query sections. Reviewing these sections, we determine that the field VALUE in GIFTS.DBF is needed to derive each sister’s total gift value. We need RECIP\_CD from GIFTS.DBF to sort and group the records so that R&R can derive total gift value and number of gifts received. RECIP\_CD is also necessary for the query, as is REASON (reason gift was proffered), and both are also in table GIFTS.DBF. Therefore, the only table we need to complete this report is GIFTS.DBF and it must be the Master table.

As indicated in Figure 10-F, I have attached a report sketch (Figure 10-G on page 12) though, in this case, it is more of a visual aide than guide toward designing the report. This report contains very few pieces of information, but these are all that are required according to the Contents section of the Guide.

**Note:** For more information concerning the seven band categories, refer to Chapter One of Volume One. The behavior of each band will be described in detail later in this chapter.

We have now concluded the first and second phases of the report definition process described on page 2. We were fortunate — though I must admit that it was by design — that this example did not provide a complicated analysis for phases one and two. The composite database is simple — GIFTS.DBF — because the data tables provide a simple basis for gathering the information we need. Later examples will delve into some of the complexities that result when the information is present in the tables, but not nearly as accessible.

## Band on the Run

The third phase from page 2 calls for us to determine where to place each of the items represented in the report sketch (as determined from the Contents section of the Guide). This report will fit on one page, since it needs to show only four values. The top portion of the page would print just once. We can send this section to the title band or page header band since either will produce the result we desire: printing at the top of the first — and only — page.

But how do we get R&R to print Rachel's gift value and count totals above (or below) Rhonda's? The answer lies in understanding how R&R reads the composite database and presents its contents based upon the report band in which we choose to place them.<sup>1</sup>

<sup>1</sup> Although this discussion is limited to R&R, the same principles apply to all banded report writing programs, or at least it should. Once you understand these relationships between the composite database and report bands, you will be able to effectively apply other report writers.

**Liveware® Report Writing Guide®**

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**Purpose**

Statement: Compare high school graduation gift values received by Rachel and Rhonda to determine if one sister received more gifts than the other.

Administration       Communication       Analysis

Report Name: Rubin Sister's High School Graduation Gift Totals

---

**Contents**

Item Description/Field Name	Field	Calc	Total	Item Description/Field Name	Field	Calc	Total
<u>ID: Rhonda vs. Rachel</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Value of each sister's gifts</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Count of each sister's gifts</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

---

**Organization**

Sort Levels	Order (A/D)	Group Levels	Pg Brk
1) <u>Sister (RECIP_CD)</u>	<u>A</u>	1) <u>Sister (RECIP_CD)</u>	<input type="checkbox"/>
2) _____	_____	2) _____	<input type="checkbox"/>
3) _____	_____	3) _____	<input type="checkbox"/>
4) _____	_____	4) _____	<input type="checkbox"/>
5) _____	_____	5) _____	<input type="checkbox"/>

---

**Query**

1) RECIP\_CD in the list "RHONDA", "RACHEL"

2) (AND) REASON equals "HSGRAD"

---

**Files**

Master Table: GIFTS.DBF

Related Table: \_\_\_\_\_ Related Table: \_\_\_\_\_

Related Table: \_\_\_\_\_ Related Table: \_\_\_\_\_

---

**Layout/Sketch**

Sketch attached?  Yes     No

Orientation  Portrait     Landscape

Special Instructions: Summary only, no records displayed

The complete Guide is a recipe to follow when developing the report. Consider any sketch a picture of the finished dish. Of course, one can rarely produce a specimen to match the one in the cookbook.

Figure 10-F: Completed Guide

Our present example is a very simple report -- layout wise. Simple appearance can be deceiving, however, as in a soufflé.

Rubin Sisters' High School Graduation Gift Totals

<u>Sister</u>	<u>Gift Count</u>	<u>Gift Values</u>
~~~~~	~~~~~	~~~~~
~~~~~	~~~~~	~~~~~

Figure 10-G: Sketch of *Rubin Sisters' HS Graduation Gifts Comparison* report.

\* \* \*

Figure 10-H displays several segments of GIFTS.DBF. The breaks indicate sections present but not shown to shrink the graphic. For simplicity the table shows only those records that will pass the Query (once we define it) and the records have been sorted so that all of Rachel's and Rhonda's gifts are together in the table. Figure 10-H thereby depicts the composite database that will result from the report specifications we outlined in the Guide.

The right-most columns in the sketch represent total fields for gift count and value for each sister. These totals' formulas are:

*SisGftCnt* — COUNT(RECIP\_CD,RECIP\_CD,Running)

*SisGftVal* — SUM(VALUE,RECIP\_CD,Running)

Total fields' values are derived according to their formulas. As described in Chapter 3 of Volume One, any total MUST include four elements: name, type, basis field and reset level.

When R&R reads the composite database and produces the report, it decides what to print based upon the information in the record it sees at each band in the layout. When R&R sees the Title band, it will select values from the FIRST record in the composite database, as shown in Figure 10-I. The Title band will print only once — at the top of the first page of the report. Label items placed in the title band will, therefore, appear at the report's beginning and field items' values will be drawn from the first record in the table.

**Note:** If you are building this report in conjunction with these instructions, select GIFTS.DBF as the master table of a new report and define these two total fields as indicated. The notation used here is similar to that used in R&R to describe total fields: field name — TYPE(basis field, reset level, other total controls). The last element will be described in further detail in Chapter 12.

Our current example does not need anything to appear at the report's start, so we did not specify a title band, as per our sketch. The sketch does specify a page header, but it contains only label items. If we had specified a field item, R&R would draw the information from the first

**GIFTS.DBF**

RECIP_CD	REASON	GIFT	VALUE
RACH	HSGRAD	Gold bracelet	35.00
RACH	HSGRAD	Savings Bond	25.00
		•	
		•	
		•	
RACH	HSGRAD	Cash	50.00
RHON	HSGRAD	Leather belt	15.00
RHON	HSGRAD	Silver pin	75.00
		•	
		•	
		•	
RHON	HSGRAD	Savings Bond	50.00

All of Rachel's and Rhonda's gift records are separated and grouped. Only records coded 'HSGRAD' pass the query and make it into the composite database.

Figure 10-H: Sorted and selected composite database for GIFTS.DBF.

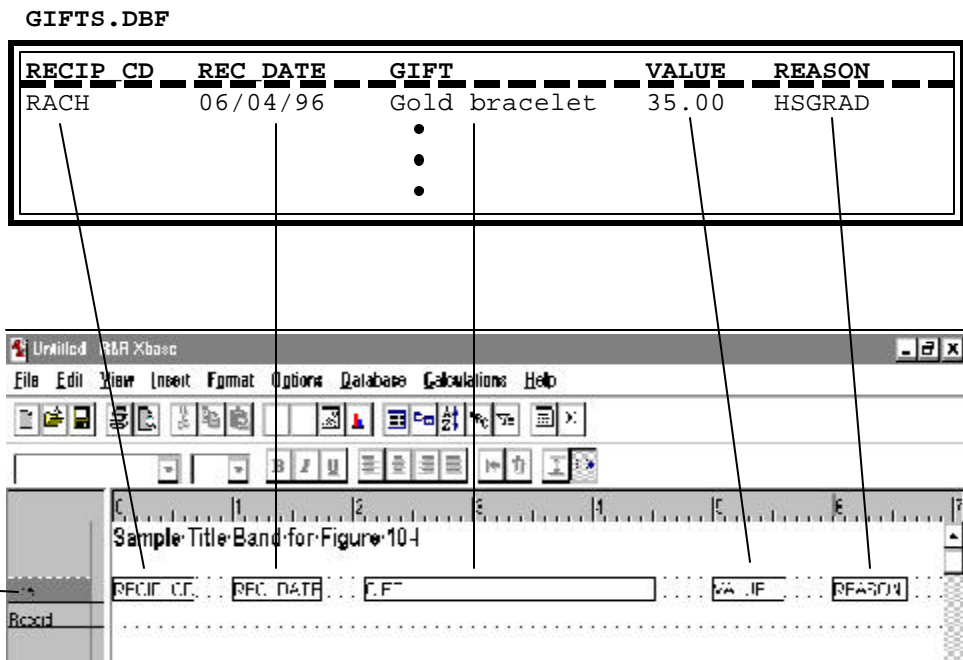
record from the composite database for the current *page*. On the first page, that record would be the first record in the composite database, as it had been for the title. If the report were to span pages, R&R would read a different record to begin each successive page.

Extending our understanding of band behavior, we may accurately predict that R&R reads information as of the LAST record of the page for the page footer band, and the last record in the composite database for the summary band. The importance of the Summary band's behavior is introduced in Chapter 11. Label items' behavior is controlled entirely by the band in which we placed them.

That brings us to the remaining component of our sketch on page 12. We want to show the gift value and count for each sister. Figure 10-J highlights where we find these key pieces of information. They all fall on the last record of the composite database for each of the two sisters.

R&R provides us with a band that will print as of the last record of each grouping level basis field value: the group footer band. Figure 10-K demonstrates this process as it applies to our current composite database. Each time R&R encounters the last record in a group, the program will the print the items placed in that grouping level's group footer band. In this case, there are only two values found in that

In reporting, the composite database is everything. The bands simply reflect what the composite database sends it.



In the figure, the title band -- printing at the beginning of the report -- will present field items from the first record in the composite database.

**Figure 10-I: Composite database first record view, with annotation from R&R screen's Title band line.**

**GIFTS**

RECIP_CD	GIFT	VALUE	SisGftCnt	SisGftVal
RACH	Gold bracelet	35.00	1	35.00
RACH	Savings Bond	25.00	2	60.00
	•			
	•			
	•			
RACH	Cash	50.00	25	785.00
RHON	Leather belt	15.00	1	15.00
RHON	Silver pin	75.00	2	75.00
	•			
	•			
	•			
RHON	Savings Bond	50.00	27	845.50

At the final record of each group, the group totals achieve their full values.

Figure 10-J: Composite database highlighting group totals.

**GIFTS**

RECIP_CD	GIFT	VALUE	SisGftCnt	SisGftVal
RACH	Gold bracelet	35.00	1	35.00
RACH	Savings Bond	25.00	2	60.00
<b>RACH</b>	<b>Cash</b>	<b>50.00</b>	<b>25</b>	<b>785.00</b>
RHON	Leather belt	15.00	1	15.00
RHON	Silver pin	75.00	2	75.00
<b>RHON</b>	<b>Savings Bond</b>	<b>50.00</b>	<b>27</b>	<b>845.50</b>
RACH	Cash	50.00	25	785.00
RHON	Savings Bond	50.00	27	845.50

If we distill the entire composite database into the final records of each group, the group footer band becomes, in essence, the record band for these 'summary' records.

Figure 10-K: GIFTS composite database highlighting R&R's action for each of the two grouping values.

grouping level (“RACHEL” and “RHONDA”) so R&R will print the group footer band twice. If there had been fifty different values of RECIP\_CD in the composite database, R&R would print the group footer band fifty times.

Label items in the group footer will print as they are typed in the group footer band in the report layout. Field items, however, are extracted from the last record in the group. As we return the our sketch on page 12, we see that the values we seek print twice — once for Rachel and once for Rhonda. We will, therefore, place the field items *SisGftCnt* and *SisGftVal* in the group footer band for RECIP\_CD as shown in figure 10-L. This instructs R&R to print the values it finds in these fields when R&R reaches the last record in each group.<sup>2</sup>

The final item from our report sketch identifies whose gift totals are whose. We cannot simply type the label items “RACHEL” and “RHONDA” since they would both be repeated in the group footer. Instead, we will use the field RECIP\_CD in the group footer since that field will contain the label we want. Once again, R&R will take this field’s value from the last record in each group. (See Figure 10-K.) Please note that this field’s value is the same for *every* record in the group since RECIP\_CD is the grouping level basis field.

### It’s Like Looking in the Mirror!

Our description of the group footer band’s behavior may be extended to the group header band, but in reverse. R&R will print the group header band each time it sees the *first* record with a new value in the grouping level basis field. Label items will print as typed, but field items are taken from that first record of the group. We would not want to print group totals in the group header band since these fields will only calculate their statistics as of the first record.

Since the group header prints at the beginning — and the group footer at the end — of each set of records, they become natural divisions for the report. We tend to find group headers where we want to specify information in effect for just that part of the report. Group footers will

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<sup>2</sup> This method of displaying the information we need to fulfill the report’s purpose is one of several possible methods. Many report purposes, and even layouts, may be accomplished in a variety of ways. Report writing is, essentially, mathematical, and like many math problems there is often more than one way to solve them. The method I’ve employed here is the most direct one — I believe — because it involves the fewest steps. Some other reporting “problems” are not so forgiving and there will be but one method to solve them. Others may be solved several ways but some methods would require much less effort than its alternatives.

**Note:** For more information on methods to avoid this restriction, refer to the section on “pre-processed” totals in Chapter 12.

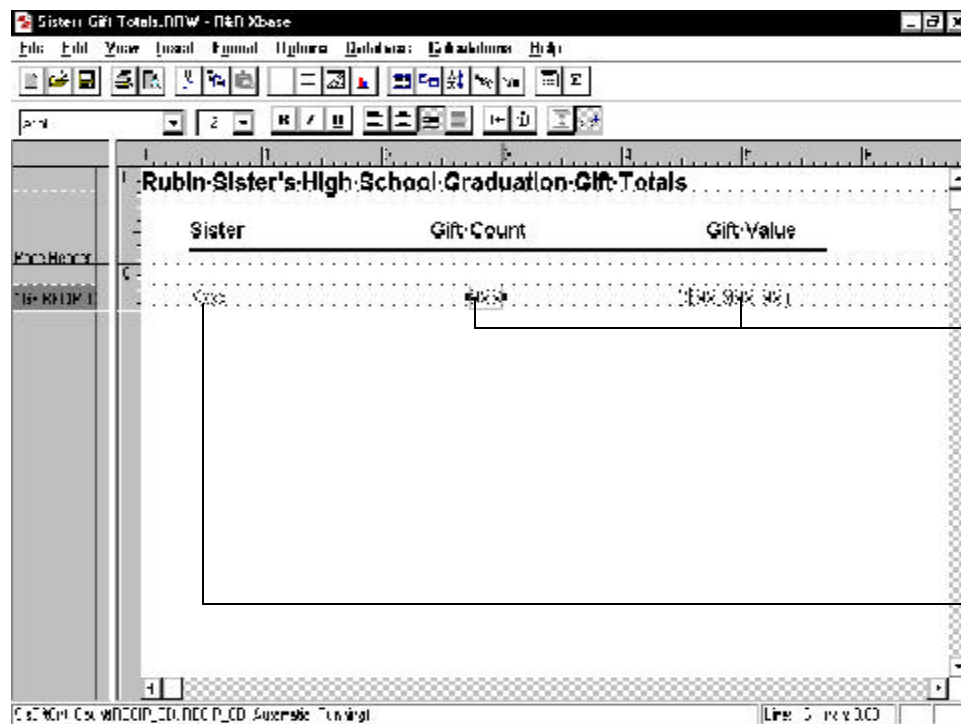


summarize the information for each section of the report. Reports may contain one, both or neither of these bands. Our current example requires just the group footer since we can identify the section and summarize the information using just the group footer band for RECIP\_CD.

The only remaining band we have not described is the record band. R&R will print this band for every record in the composite database. If there are 100,000 records in the composite database, we'll get a very long report indeed. But the record band is not required and our example omits it. We lose the record detail that drives the sisters' gift statistics, but such detail does not address our stated purpose. Omission of unnecessary data is one of the primary tenets of good reporting.

### Now We're Cooking

We have completed the three phases described on page 2. Our only remaining task is to translate our understanding of the report to R&R for execution. This is where knowledge of R&R's features becomes paramount. When I conduct training classes I spend much of the time demonstrating how R&R provides all the tools necessary to produce the report we want. Understanding R&R capabilities is



The two group level totals, *SisGftCnt* and *SisGftVal* are placed on the RECIP\_CD group footer line since it is at the last record of the composite database that these totals are ultimately achieved.

The RECIP\_CD value is the same for every record in the group, so this field item can appear in either the group header or footer. In most reports, I would replace the code with its description -- space allowing.

Figure 10-L: R&R program screen with completed report layout, highlighting placement of key elements.

### ***Just Give Me The Bottom Line***

*If we were to extend the knowledge we gained from the current example, we find that using a group footer band in place of a record band dramatically abbreviates what would be a long report. If we were to take just the last record of each group, and stack them up, we would have — ta-da — a table!! The group footer band, in effect, reads this table instead of the composite database. This technique is known as “summary record” reporting since the last record of each group summarizes the information for each set of records. Our present example has just two groups so its summary record “table” would have two records. Your reports may result in dozens, or even hundreds, of summary records, depending upon how many values your composite database holds for the grouping field.*

*Most analysis reports employ this technique, particularly when the records themselves are too numerous or boring to show in the report. (This is true most of the time.) Visualizing a table of summary records lets us look past the details and focus on the bottom line.*

important, of course, but far from the only skills needed to produce *useful* reports.

My report building demonstrations must appear to many people like a TV chef. He chops, mixes, sautés, bakes etc. with fluidity and grace. When the audience tries it at home, they can’t find the French whisk, they burn the sauce, and can’t clarify the butter. At the end of the show, the chef displays the finished dish — its perfect, naturally — that he or she “prepared earlier”.

It’s not so important during these demonstrations that you learn how to cook the dish, but rather how to think about cooking the dish. The rest is practice and experience, which takes time.

### ***No-Stick Cookware***

*I prefer R&R over other reporting programs. I can successfully use any of them for most reporting needs, even though I rarely use them.*

*Through the years I have found that R&R provides more — and more functional — tools for manipulating the composite databases and translating the report specs for production. I measure reporting programs’ performance based upon how easily I can execute complex reports. With most other programs I eventually get stuck, but never with R&R. It’s the Teflon of reporting software.*

\* \* \*

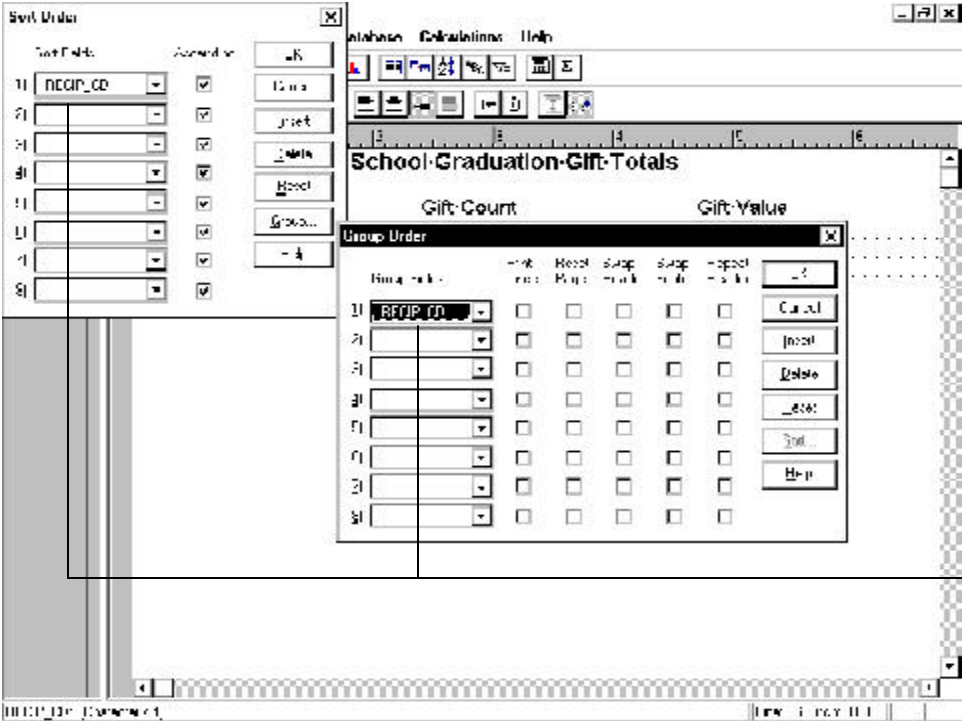
Figure 10-L (page 17) translates the report sketch to specific items placed in specific bands. We must also define *SisGftCnt* and *SisGftVal* as total fields and place them in the RECIP\_CD group footer band. This satisfies the Contents and Layout sections of the Guide (page 19).

The Guide’s Organization Section directs that RECIP\_CD be the basis field for sorting and grouping level 1. These settings are shown in Figure 10-M.

### You Can’t Get In Without a Ticket

The only remaining, non-translated section of the Guide is the Query section. If we were to run the report without it, our composite database would include all records in the master table. They would be sorted, and the grouping would work, but the totals resulting from the additional records would be invalid for our analysis.

Figure 10-N displays the Query dialog box suggested by the discussion on pages 9-10. The first query element specifies that we wish to include only high school graduation gifts (REASON equal to



Sorting and grouping by RECIP\_CD assembles the records for each sister in the composite database for totalling record (gift) counts and gift values for each sister.

Figure 10-M: Sort Order and Group Order dialog boxes

The first query element selects just Rachel's and Rhonda's gift received records; the second selects only high school graduation gifts. The AND connector eliminates any records that do not evaluate TRUE to both conditions.

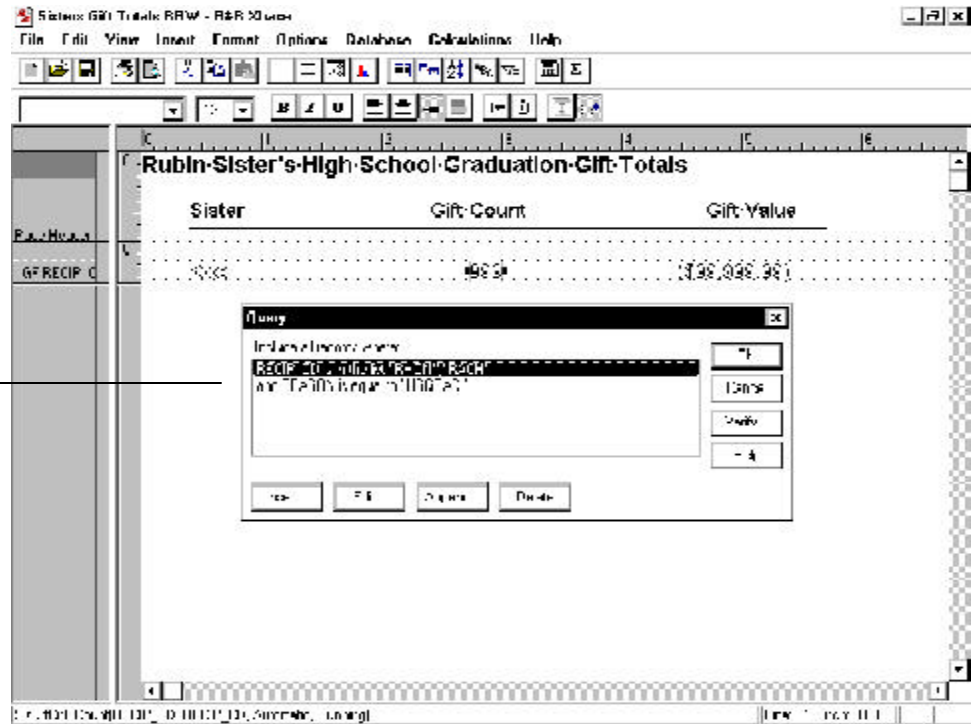


Figure 10-N: Query dialog box to limit records to Rachel's and Rhonda's high school graduation gifts.

“HSGRAD”). Since the Rubin family members had both given and received gifts for this reason, we must further limit the records to those where either Rachel or Rhonda was the recipient: RECIP\_CD in the list “RACHEL”,”RHONDA”.

### See! They Like Me More!!

We are now ready to run the report. Figure 10-O presents the answer to our original question: Did Rachel receive more presents than Rhonda? As the twice-presented group footer bands reveal, the answer is no. Rhonda, however, can take solace in knowing the total value of her gifts did exceed Rachel's by much.

Rubin Sisters' High School Graduation Gift Totals

Sister	Gift Count	Gift Value
RACH	20	\$1,827.00
RHON	20	\$1,869.00

The group footer band, repeated for the two older Rubin siblings, present the answer to our purpose. All reports will be this successful -- if not always as simple -- if developed using these analytical techniques.

Figure 10-O: Print Preview window focused on summary lines.

### Exercise Box #1: Do It On Purpose

Determine one or more possible approaches to address the following questions. If you wish, try to build these reports from the data tables provided on the **Data Samples Diskette**.

- 1) What changes to the example report will be necessary to include Richard's graduation gifts in the analysis when he graduates in two years?
- 2) If we wanted to compare the two sisters' Sweet Sixteen gift totals, as well as the high school graduation totals, can you suggest one or more methods of modifying this report to do so? (Extra credit for multiple answers!!)
- 3) If we wanted to list the gifts each sister received, so that we could understand how each sister came to her totals, what changes would you recommend? (Try a sketch and compare it to ours.)

Answers are located in the **Exercise Answers** section in the back of the book.

## Notes