Chapter 5
R&R Open Scripting

Introduction

R&R for Windows provides an open architecture for report generation. Called "R&R Open Scripting," this new architecture allows developers to create application-specific reporting front ends that use R&R's sophisticated reporting engine for actual report generation. R&R Open Scripting allows any developer who can generate text files to communicate effectively with R&R.

You can take advantage of the R&R Open Scripting interface to generate an R&R report in either of two ways. The Report Wizards make use of this script mechanism to pass a user-defined report specification from the R&R Wizards to the main R&R executable. In order to provide a custom interface for report creation, developers can configure R&R to integrate their own Windows executable (EXE) in place of the R&R Wizard application.

In addition to the Report Wizard interface, a report can be generated by passing a script file pathname on the R&R command line. When R&R is invoked in this way, the script file is read and the report is created automatically. Passing a script file on the command line requires that a master table pathname be specified in the Report section of the script file. See the **Script File Format** section in this chapter for information about the contents of the R&R script file.

Explanation of R&R Open Scripting is presented in the following sections:

- Custom Report Wizards
- Script File Format
- Script Command-Line Argument (/S)
- Report Wizard Input File

Custom Report Wizards

The R&R Open Scripting interface allows developers to integrate their own intelligent front ends to their applications. Through this mechanism you can provide a custom user interface to gather the information needed to

generate a report. As you will see, integrating your own custom user interface into R&R is very simple.

Configuring the Custom Application

To replace the R&R Wizards program with your own, simply add the following settings to the R&R initialization file (RRW.INI) located in your Windows directory:

> **[Special]**
> **WizardEXE=C:\RR\MYWIZARD.EXE**

If the **[Special]** section already exists, add the **WizardEXE** keyword to the existing section.

Note that if a full pathname is not specified for the executable file, Windows will search for it in the following order:

1. Current directory;
2. Windows directory;
3. Windows System directory;
4. The R&R program directory;
5. The DOS path;
6. Directories mapped on a network.

To restore the built-in Report Wizards, simply remove the **WizardEXE** setting from the initialization file.

Invoking the Custom Application

As is the case with the built-in Report Wizards, a custom application is invoked from either the R&R startup dialog or from the File New dialog. (Note that the Options ⇒ Preferences dialog provides "File New" settings that allow these dialogs to be bypassed). After Report Wizards is selected and a database table is chosen, R&R immediately invokes the application specified in the R&R initialization file. While the custom application is active, R&R is disabled; it is enabled when the custom application terminates.

Three arguments are passed to the custom application on the command line. These arguments are separated by semicolons (;). The first is the pathname to an "input file" containing information used by the R&R Wizards. The second argument is the pathname to the script file in which the report information is to be written. The third argument is the complete pathname, including drive specifier, of the master database table selected within R&R.

The master database table passed on the command line must be used by the custom application as the basis for report generation. For example, the following is a valid command line to the custom application:

```
C:\WIN\TEMP\WZI.TMP;C:\WIN\TEMP\WZO.TMP;C:\RR\EMP.DBF;
```
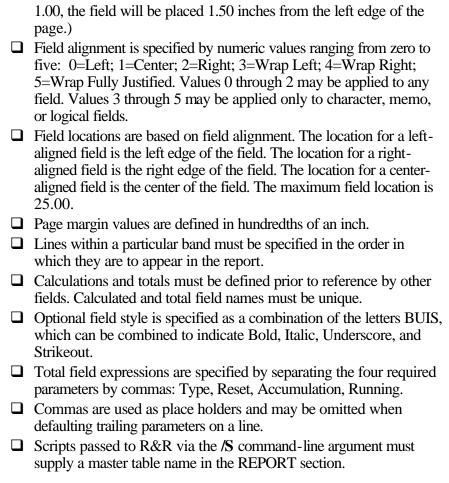
The script file is read by R&R when the custom application terminates. After validating the contents of the script file, R&R generates the report and performs any actions specified, such as previewing the report. R&R will indicate any errors detected by displaying an error message box identifying the invalid line in the file.

Script File Format

The R&R script file format is similar to that of a Microsoft Windows initialization (INI) file. Script files are made up of a series of sections that contain keyword definitions. However, R&R script files may contain multiple instances of a particular keyword in a given section and duplicate instances of a given section name, which is generally not the case with Windows initialization files.

The general rules that apply to the format of R&R script files are as follows:

❑ Commas are used to separate data on a given line. Therefore field names may not contain commas; in addition, decimal values (field locations, margins, etc.) must always use a period as the decimal point and all dimensions are in inches.

❑ Blank lines or lines beginning with a semicolon (considered comment lines) are ignored.

❑ The maximum line length is 300 characters. Line continuation is not supported.

❑ All Boolean values are set by specifying either T or F.

❑ Missing parameters that are optional, such as margins or page size, will be set to default report values. Missing field length parameters will be set to the values stored in the database table.

❑ All field definitions specified will be inserted on the layout.

❑ All field location values are defined in hundredths of an inch. Values are specified as absolute (1.00) or relative (+1.00). Relative field locations are based on the end of any previously defined field on the line. Absolute column positions should be computed based on the Pitch specification in the [System] section of the input file. (Take into account the left margin setting when defining field locations — for example, if the left margin is 0.5 inches and field location value is

1.00, the field will be placed 1.50 inches from the left edge of the page.)

❑ Field alignment is specified by numeric values ranging from zero to five: 0=Left; 1=Center; 2=Right; 3=Wrap Left; 4=Wrap Right; 5=Wrap Fully Justified. Values 0 through 2 may be applied to any field. Values 3 through 5 may be applied only to character, memo, or logical fields.

❑ Field locations are based on field alignment. The location for a left-aligned field is the left edge of the field. The location for a right-aligned field is the right edge of the field. The location for a center-aligned field is the center of the field. The maximum field location is 25.00.

❑ Page margin values are defined in hundredths of an inch.

❑ Lines within a particular band must be specified in the order in which they are to appear in the report.

❑ Calculations and totals must be defined prior to reference by other fields. Calculated and total field names must be unique.

❑ Optional field style is specified as a combination of the letters BUIS, which can be combined to indicate Bold, Italic, Underscore, and Strikeout.

❑ Total field expressions are specified by separating the four required parameters by commas: Type, Reset, Accumulation, Running.

❑ Commas are used as place holders and may be omitted when defaulting trailing parameters on a line.

❑ Scripts passed to R&R via the **/S** command-line argument must supply a master table name in the REPORT section.

The following section provides a breakdown of the script file support in this version of R&R.

Script File Sections and Keywords

The report sections and keywords used in this version of R&R are indicated on the following pages. All sections and keywords are optional, with the exception of the **MasterTable=** keyword in the Report section, which is required when a script file is passed to R&R on the command line. This keyword is ignored if specified in a script file generated by a custom application that replaces the R&R Report Wizards.

REPORT SECTION
[Report]
MasterTable=pathname

If R&R is called with a script file as a command-line argument, the
MasterTable argument will be used as the table within the specified
database to be used to generate the report described in the remainder of the
script file.

ACTION SECTION
*R&R Open Scripting currently supports two menu "actions." These
optional commands allow for printing or previewing the report
immediately after it is generated. Only one menu action should be
specified for each script. If more than one action is specified, only the
first one will be performed.*

[Actions]
Menu=FilePrint
Menu=FilePrintPreview

PAGE FORMAT SECTION
[PageFormat]
PageSize=(0: Letter; 1:Legal; 2: Executive; 3: A4)
TopMargin=(Inches)
BottomMargin=(Inches)
LeftMargin=(Inches)
RightMargin=(Inches)
Landscape=(T or F)
InterlineSpacing=(T or F)
PreviewZoom=(0: Minimum; 1: Mid-level; 2: Maximum)

RECORD FORMAT SECTION
[RecordFormat]
AveryLabel=(Label Name)
RecordsAcross=(1 to 99)
RecordWidth=(Inches)
RecordHeight=(Inches)
PrintColsAcross=(T or F)

CompressRecordGroup=(T or F)
SuppressRecordLines=(T or F)
BeginLineOnSemi=(T or F)
HeadFootSummary=(T or F)
BreakRecordArea=(T or F)

SORT SECTION
Sort levels must be declared in contiguous order (no gaps). Sort fields will be copied to group fields up until an existing group field definition (see below) is encountered. Setting "SortOrderN=T" indicates ascending order.

[Sort]
SortField1=FieldName
SortOrder1=(T or F)
        through:
SortField8=FieldName
SortOrder8=(T or F)

GROUP SECTION
Group fields must be declared in contiguous order (no gaps).

[Group]
GroupField1=FieldName
        through:
GroupField8=FieldName

BAND LINE SECTION
Band lines are created by placing band sections into the script file. One band line will be created for each band line section that is entered. Fields are positioned on each line by placing the field definition keywords (described below) within the appropriate band line section.

[Title]
[PageHeader]
[GroupHeader1] through [GroupHeader8]
[Record]
[GroupFooter1] through [GroupFooter8]

[PageFooter]
[Summary]

FIELD DEFINITION KEYWORDS

The following field definition keywords must be placed within the appropriate band line section. Field definitions are indicated by a leading keyword, such as "CharField=", followed by a series of parameters separated by commas.

Here is an example of a database character field definition that will be placed on a Record line. Field name is CUSTNAME*; trim is* True*; location is* 1.00 *inches; alignment is* left*; style is* Underscored*; and length is* zero *(use the field length specified in the master table).*

Example: **[Record]**
             CharField=CUSTNAME, T, 1.00, 0, U, 0

DATABASE CHARACTER FIELD
CharField=Name (required),
        Trim (T or F),
        Location,
        Alignment,
        Style (BUIS),
        Length

DATABASE NUMERIC FIELD
NumField=Name (required),
        Trim (T or F),
        Location,
        Alignment,
        Style (BUIS),
        Integers,
        Decimals,
        Numeric picture:
        0: Fixed; 1: Scientific; 2: Currency; 3: Comma; 4: General;
        5: Percent

DATABASE DATE FIELD
DateField=Name (required),
        Trim (T or F),
        Location,

Alignment,
Style (BUIS),
Date picture:

0: dd-mmm-yy	12: dd/mm/yy
1: dd-mmm-yyyy	13: dd/mm/yyyy
2: dd-mmm	14: dd.mm.yy
3: mmm-yy	15: dd.mm.yyyy
4: mmm-yyyy	16: yy-mm-dd
5: mmmm d, yyyy	17: yyyy-mm-dd
6: d mmmm yyyy	18: mm/dd
7: mmmm yyyy	19: dd/mm
8: mmmm d	20: dd.mm
9: d mmmm	21: mm-dd
10: mm/dd/yy	22: Long International
11: mm/dd/yyyy	23: Short International

DATABASE DATE/TIME FIELD
DateTimeField=Name (required),
Trim (T or F),
Location,
Alignment,
Style (BUIS),
Date picture:

0: dd-mmm-yy	12: dd/mm/yy
1: dd-mmm-yyyy	13: dd/mm/yyyy
2: dd-mmm	14: dd.mm.yy
3: mmm-yy	15: dd.mm.yyyy
4: mmm-yyyy	16: yy-mm-dd
5: mmmm d, yyyy	17: yyyy-mm-dd
6: d mmmm yyyy	18: mm/dd
7: mmmm yyyy	19: dd/mm
8: mmmm d	20: dd.mm
9: d mmmm	21: mm-dd
10: mm/dd/yy	22: Long International
11: mm/dd/yyyy	23: Short International

Time picture:
0: h:mm

1: hh:mm

2: h:mm:ss

3: hh:mm:ss

4: h:mm am

5: hh:mm am

6: h:mm:ss am

7: hh:mm:ss am

8: International

DATABASE TIME FIELD

TimeField=Name (required),

Trim (T or F),

Location,

Alignment,

Style (BUIS),

Time picture:

0: h:mm

1: hh:mm

2: h:mm:ss

3: hh:mm:ss

4: h:mm am

5: hh:mm am

6: h:mm:ss am

7: hh:mm:ss am

8: International

TEXT FIELD

TextField=Text (required, placed within double quotes),

Trim (T or F),

Location,

Alignment,

Style (BUIS)

CALCULATION CHARACTER

CalcChar=Name (required),

Trim (T or F),

Location,

Alignment,

Style (BUIS),

Length (required),

Expression:

Calculated Field: Standard expression format

(within double quotes), or

Total Field: Type, Field, Reset, Accumulation, Running

Type	*Reset*	*Accumulation*	*Running*
0: Count	G: Grand	A: Automatic	T (Running)
3: Minimum	P: Page	E: Every	F (Preprocessed)
4: Maximum	1-8: Group	P: Page	
		1-8: Group	

CALCULATION NUMERIC

CalcNum=Name (required),

Trim (T or F),

Location,

Alignment,

Style (BUIS),

Integers (required),

Decimals (required),

Numeric picture:

0: Fixed; 1: Scientific; 2: Currency; 3: Comma; 4: General;

5: Percent

Expression:

Calculated Field: Standard expression format

(within double quotes) or,

Total Field: Type, Field, Reset, Accumulation, Running

Type	*Reset*	*Accumulation*	*Running*
0: Count	G: Grand	A: Automatic	T (Running)
1: Sum	P: Page	E: Every	F (Preprocessed)
2: Average	1-8: Group	P: Page	
3: Minimum		1–8: Group	
4: Maximum			
5: Standard Deviation			
6: Variance			

CALCULATION DATE
CalcDate=Name (required),
    Trim (T or F),
    Location,
    Alignment,
    Style (BUIS),
    Picture (see DATABASE DATE FIELD above)
    Expression:
    Calculated Field: Standard expression format
    (within double quotes) or,
    Total Field: Type, Field, Reset, Accumulation, Running

Type	*Reset*	*Accumulation*	*Running*
0: Count	G: Grand	A: Automatic	T (Running)
3: Min	P: Page	E: Every	F (Preprocessed)
4: Max	1-8: Group	P: Page	
		1–8: Group	

CALCULATION DATE/TIME
CalcDateTime=Name (required),
    Trim (T or F),
    Location,
    Alignment,
    Style (BUIS),
    Date picture (see DATABASE DATE/TIME FIELD above)
    Time picture (see DATABASE DATE/TIME FIELD above)
    Expression:
    Calculated Field: Standard expression format
    (within double quotes) or,
    Total Field: Type, Field, Reset, Accumulation, Running

Type	*Reset*	*Accumulation*	*Running*
0: Count	G: Grand	A: Automatic	T (Running)
3: Min	P: Page	E: Every	F (Preprocessed)
4: Max	1-8: Group	P: Page	
		1-8: Group	

CALCULATION TIME

CalcTime=Name (required),

Trim (T or F),

Location,

Alignment,

Style (BUIS),

Time picture (see DATABASE TIME FIELD above)

Expression:

Calculated Field: Standard expression format

(within double quotes)

or,

Total Field: Type, Field, Reset, Accumulation, Running

Type	*Reset*	*Accumulation*	*Running*
0: Count	G: Grand	A: Automatic	T (Running)
3: Min	P: Page	E: Every	F (Preprocessed)
4: Max	1-8: Group	P: Page	
		1-8: Group	

POINTSIZE

PointSize=Size in points

R&R Open Scripting uses the default point size set in Options $\Rightarrow$ Default Settings for all fields. You can use the PointSize keyword to specify a new point size. Include the PointSize keyword in any Band Line Definition section to set a point size for all subsequent fields specified until another PointSize keyword is encountered.

In the following example, PointSize=16.0 changes the point size to 16 for the DEPARTMENT text field and to 14 for the FULLNAME field. PointSize=0 then returns the point size to the default for the SALARY field.

```
;BAND LINE DEFINITION SECTION
[PageHeader]
PointSize=16.0
TextField="DEPARTMENT", F,0.0, 0, U
PointSize=14.0
TextField="FULLNAME", F,2.5, 0, U
PointSize=0
TextField="SALARY", F,6.0, 2, U
```

Sample Script Output

A sample label script generated by the R&R Report Wizards is shown below. Although the script is relatively simple, it generates a fully formatted report containing report parameters such as sort and group information, various report bands, total fields and calculated fields. Note that the [Group] section is not required, since the group settings are automatically copied from the sort settings. Because the **FilePrintPreview** keyword has been specified as the menu action in the [Actions] section, the report will be previewed automatically after it has been generated.

```
; REPORT SECTION
[Report]
MasterTable=c:\data\employee.dbf

; ACTION SECTION
[Actions]
Menu=FilePrintPreview

; PAGE FORMAT SECTION
[PageFormat]
PageSize=0
TopMargin=.5
BottomMargin=.5
LeftMargin=.5
RightMargin=.5

; BAND LINE DEFINITION SECTION
[Title]
TextField="DBRSAMPL", F, 0.00, 0
TextField="*** R&R Grouped Columnar Report ***",F,3.75,1
CalcChar=wizDate,F,7.5,2,,8,"DTOC(date())"
[Title]
[GroupHeader1]
CharField=DEPARTMENT,F,0.0,0,BI
[GroupHeader1]
TextField="DEPARTMENT",F,0.0,0,BU
TextField="FULLNAME",F,1.7,0,BU
TextField="HIRE_DATE",F,4.5,1,BU
TextField="SALARY",F,6.0,2,BU
[Record]
CharField=DEPARTMENT,F,0.0
CharField=FULLNAME,F,1.7
DateField=HIRE_DATE,F,4.5,1
NumField=SALARY,F,6.0,2
[PageFooter]
```

```
[PageFooter]
TextField="Page ",F,3,1,B
CalcNum=wizPage,T,4.5,2,B,3,0,0,"PageNo()"
[GroupFooter1]
CalcNum=wizGpTot3,F,6.0,2,,,,,0,2,SALARY,1,A,T
[Summary]
CalcNum=wizGrTot3,F,6.0,2,,,,,0,2,SALARY,G,A,T

; SORT SECTION
[Sort]
SortField1=DEPARTMENT
SortField2=FULLNAME
```

Script Command-Line Argument (/S)

A script file may be passed on the R&R command line by appending the pathname of the script file to the **/S** switch:

/SC:\RR\SCRIPT.TXT

When R&R starts, the script file will be opened and validated. If no errors are encountered the report will be generated and any actions requested, such as previewing the report, will be performed.

Note: When a script file argument is passed to R&R, command-line arguments **/L** (library path), **/R** (report name), **/T** (table name) and **/I** (table name/instant report) are ignored.

Report Wizard Input File

R&R creates a temporary input file that is used by the R&R Wizards. This input file contains information that is useful to users of the R&R Open Scripting interface. The input file format is similar to that of a Microsoft Windows initialization (INI) file. These files are made up of a series of sections that contain keyword definitions.

Although the information passed in the input file is used by the R&R Report Wizards, this file may be ignored by any custom application.

The sections and keywords placed in the input file are indicated in the following paragraphs. Some sections and keywords will always be present; others are optional and depend on the number of records in the table passed to the Wizards.

```
[System]
Product=0 (RRW)
```

```
Pitch=12 (Pitch of default font)
PageWidth=7.50 (Default page width minus left and right
margins)
```

The TableDef section lists the supported database fields in the table passed on the command line, including the data type and field lengths. For numeric fields, the integer and decimals places are specified.

The data types are as follows:

0: Character	4: Memo
1: Numeric	5: Date/Time
2: Date	6: Time
3: Logical	

The following is a sample TableDef section for a master table containing six fields. Note that the VALUE field is a numeric field and includes integer and decimal places instead of a single field length.

```
[TableDef]
NAME=0,21
STREET=0,17
CITY=0,12
STATE=0,2
ZIP=0,5
VALUE=1,5,0
```

Up to twenty rows of result data from the table passed to the Report Wizards are included in the input file. Each of these records is placed in a separate section, labeled Row1 through Row20. Data in each field is truncated to 50 characters. Here are samples of two rows from the database table described above:

```
[Row1]
NAME=Ashley, Steve
STREET=100 Main St
CITY=Westboro
STATE=MA
ZIP=01581
VALUE=38500
```

```
[Row2]
NAME=Axelhouse, Jim
STREET=201 Oak Ave
CITY=Northboro
STATE=MA
ZIP=01532
VALUE=25500
```