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Producing long detailed lists of items, sorted and summarized

Detail List Reports

The Indefinite Nature of the List Report

If you were the manager of a library, you might want to create a list report like this: "Print a list all of the students who have books overdue. List the books for each of the students and calculate the value of the penalty for that book. Summarize the penalties for each student and give me a total for all of the students. The output should look something like this:"

```
Able, John                505-52-6841
    The Grapes of Wrath      63      14.38
    The Witches of Eastwick  38       6.14
                                -----
                                20.45

Anderson, Beverley       568-45-7191
    Fish King of Alaska     128     56.45
                                -----
                                56.45

Asaud, Ron M.           205-56-3682
    A Guide to DB2          23       6.14
    Thoughts & Discourses    7       1.12
                                -----
                                7.26
```

Such a report is composed of two *groups*: the outer group is the alphabetized list of students, the inner group is the list of books that each student has out, sorted by the length of time the book is out. We call this kind of report an *indefinite (detail) list report*. The indefinite nature of the detail report is due to the fact that initially you don't have any idea of how long a list you're going to generate. That indefinite nature is in direct contrast to the fixed row/column format of a financial spreadsheet report where summaries will occur in specific, preassigned locations.

Construction of a Detail List Report

A detail list report format will always be reminiscent of the outline format you used in your high-school History class:

- I. major subject heading
 - A. minor subject heading
 - 1. sub-subheading
 - a. example
 - b. example
 - c. example
 - 2. sub-subheading
 - a. example
 - b. example
 - B. minor subject heading
 - 1. sub-subheading
 - a. example
 - b. example
- II. major subject heading
 - A. minor subject heading
 -
 -
 -



Each indention represents a new group. Four groups occur in the example above. In the abstract, the information found in each group is identical, although the values will obviously differ. *The information presented within each indented group must be somehow directly related to information appearing in the group level immediately above it.*

The idea of a group is key to understanding a detail list report. The group is where items are listed, sorted and summarized. In QueryCalc, 50 different summarizations (averages, maximums, sums, counts, etc.) can be simultaneously maintained for a single detail list report. Items which appear in lower levels can be summarized in all higher group levels, allowing you to create grandtotals (or grandaverages, or whatever) at every successively higher level.

QueryCalc repeats the basic pattern of the History-class outline in its report layout structure, even to the point of automatically indenting the report in its default layout setting.

What is a Group?

A group occurs every time a new, more detailed list of items is desired. To illustrate, let us presume that we would like a detailed list of all of the generals who participated in all of the wars that the United States has fought since the Revolutionary War, listed battle-by-battle.

The outermost group (Group 1) will be a list of the wars. The second group (Group 2) will be a list of each of that war's battles, and the third group (Group 3) will be a list of the generals for each battle. The format of a multi-group report will always be somewhat similar to the outline form shown on the opposite page.

Let us presume that the information we will need for the report appears in three different datasets, WARS, BATTLES and GENERALS. If you are familiar with the concept of JOINS and MULTIFINDs, we want you to forget everything that you know. The way QueryCalc is put together is much simpler and much more powerful. In QueryCalc, a query question extracts information out of only one dataset. Once that extracted information appears in a cell, you may use it as part of the qualifying information for your next query question. In QueryCalc, the process of linking or joining datasets together is very straightforward and intuitive.

How a Report is Built

The first command of any list report is **/REPORT**. This command converts a standard spreadsheet page into a detail list report page. The first query question on the **/REPORT** page might be:

```
@using wars, find when year > 1775
and country is US
```

What QueryCalc will do when this question is executed is find every record in the WARS dataset that meets the specified criteria. The qualifying records will be remembered, and once the initial search pass has been completed, each record will be brought back up, one at a time. All of the information that you wish to get from that one record is then read onto the spreadsheet by a series of **@REREADING** query questions:

```
@rereading, val of war-code
@rereading, val of war-name
@rereading, val of start-date
@rereading, val of end-date
```

The Report's Query Questions

The second group, which is to be a list of all of the battles for a specific war, will be found in the same manner. And the same is true of the third group, the generals who commanded each battle in each war. The sequence of query questions will always look something like this:

```

A1: @using wars, find when year > 1775
      and country is US
A2: @rereading, val of war-code
A3: @rereading, val of war-name
A4: @rereading, val of start-date
A5: @rereading, val of end-date

A6: @using battles, find when war-code is [a2]
A7: @rereading, val of battle-code
A8: @rereading, val of battle-name

A9: @using generals, find when war-code is [a2]
      and battle-code is [a7]
A10: @rereading, val of lname
A11: @rereading, val of fname
A12: @rereading, val of command-strength

```

Each new group is defined by an @FIND. In this example, Group 1 begins in Cell A1, Group 2 begins in Cell A6, and Group 3 begins in Cell A9.

The first line of a /REPORT page must always be an @FIND, and it is normally stand-alone (that is, it does not depend on any other cell for its information). But the subsequent @FINDs on the /REPORT page should always be written such that they back-reference information in the earlier groups. In this example, Group 2 (Cell A6) finds the appropriate battles for the war that is currently displayed in Group 1. And Group 3 (Cell A9) finds the appropriate generals for the war and battle currently displayed in Groups 1 and 2.

Reading the @FIND Lists

QueryCalc maintains three lists in a 3-group report. The first group's list, which is a list of wars, is read very slowly. The second group, the battles, is read more quickly. And the last group, the generals, is read very quickly indeed. When the list of generals for the first battle is exhausted, the next battle for the current war is read from the Group 2 list and a new list of generals is found. When this new list is exhausted, the next battle is read. The process repeats until the list of all of the battles for the war is done, and then the first group moves forward one war. The process simply repeats until all of the values in all of the lists have been read.

The Resulting Report

The resulting report may be formatted in an almost infinite number of ways. One possibility is shown here:

<input type="radio"/>	U.S. Civil War, 1861-1865	<input type="radio"/>
	July 1861, First Battle of Bull Run	
<input type="radio"/>	Johnston, CSA	13,000
	Beauregard, CSA	28,100
	McDowell, USA	31,800
<input type="radio"/>	May 1862, Yorktown	<input type="radio"/>
	Lee, CSA	63,600
	Johnston, CSA	47,200
<input type="radio"/>	McClellan, USA	83,450
	June 1862, Seven Days Battle	
<input type="radio"/>	Johnston, CSA	41,400
	Lee, CSA	57,300
	McClellan, USA	75,700
<input type="radio"/>	Sept 1862, Antietam	<input type="radio"/>
	Lee, CSA	103,650

The Sequence of Commands

Four commands are used to build a list report. They are used in this order:

/REPORT
!!
/LAYOUT
/PRINT

Three new commands are unique to the detail list report writer:

- | | |
|---------------------|---|
| /REPORT | converts a standard spreadsheet page into a detail list report page |
| /LAYOUT M | invokes QueryCalc's editor, allowing you to modify the basic formatting structure for page M. If the page is not specified, the current page is assumed. |
| /NEWLAYOUT B | invokes QueryCalc's editor, but erases the previous layout and builds a new default layout for Page B. If the page is not specified, the current page is assumed. |

The Report Page

A **/REPORT** page consists of four prespecified columns. You cannot increase or decrease that number, nor can you change the widths of the columns. Each column is used for a specific bit of information.

B	DEMOREPT equation (a)	/report name(b)	Col Dec2 , RJ sort(c)	width(d)
1	-----	find when	keyname<>0;limit=100-----	
2	ZLEOSS	keyname	1a	
3	SANTOS LEOS	name		
4	1313 EAST MADRID	address		
5	TAOS			
6	NM			
7	88003			
8	TAOS,NM 88003	city		
9	101	acctcode		
10	20,652.82	amount		
12				
13				
14				
15				

The layout of a single group /REPORT page

Column A may contain only equations (query questions, text equations, etc.) which will be used in extracting information from the database(s).

Column B will contain the names you wish to assign to the results. These names are important for two reasons. They will become the default column headers and the item value names used in **/LAYOUT**. The names also define which items can be sorted.

Column C can contain only sorting information. Within each group, items to be sorted are identified as "1a", "2d", "3a", etc. The number refers to the level of the sort (1=first level), "a" & "d" meaning ascending and descending, respectively. Each group level may have up to nine sort levels. Group 1 sort items take precedence over Group 2 items, Group 2 items take precedence over Group 3, and so on. The maximum number of sort levels within one report is 20. Sort level requests greater than 20 are simply ignored.

Column D will contain the widths you wish to associate with each item on the printout. Default widths are 36 characters for text items, 10 characters for numeric items. You may respecify these widths if you find them inappropriate.

Looking at the example on the opposite page, you'll notice that basically only columns A and B are filled in. These two columns must have something in them or you don't have a report. Columns C and D, on the other hand, are only optionally used.

The detail list report writer uses two auxiliary temporary files for each page in QueryCalc that is defined to be a /REPORT page. The first is a flat file which records all of the extracted data. This intermediate file is also used for sorting. Whenever the page is recalculated (!!), this temporary file is rebuilt. If you make any changes on the /REPORT page (other than in sort column C or simple formatting changes in column A), the file is purged and must be recalculated again.

Once the data file exists though, you may /PRINT the report page repeatedly without having to recalculate the data. This will prove to be particularly useful when reformatting the output using the /LAYOUT command.

Although the intermediate data file is not meant to be seen, it can be read by EDITOR/3000, and you may want to look at it. It's name is QCRPLST x , where x is the report page letter of interest.

The second temporary file stores the formatting information used in the formatting command /LAYOUT. Again, one file exists for each /REPORT page. Typing /LAYOUT invokes QueryCalc's internal editor and brings up the current layout file for the page. The first time a report page is laid out, QueryCalc will create a default formatting file for you based on the names and widths specified on the report page. Because of this default feature, it is possible—and many times desirable—to skip the layout step and simply print the results of the recalculated report page.

Examples of Report Pages

To illustrate the operation of /REPORT pages, I will refer to example reports found in the training account, QCDEMO.AICS. The file of interest is called DEMORPRT. If you wish to follow along in QueryCalc, type:

```
:hello user.aics
:run qc.qcprogs.aics
    /load demorprt
```

All of the examples referred to in the remainder of this chapter are pages in DEMORPRT.

Pages A & B: A Simple, Single Group Report

The demonstration database, QCDEMO, is an actual construction company's database. The first two report pages of DEMORPRT were put together to list all of the suppliers to the construction company, in the alphabetical order of their keynames, and the total amount of money spent with each supplier over the years.

A	_____equation (a)_____	_____name (b)_____	__sort (c)__	__width (d)
1	_____find when keyname<>0;limit=100_____			
2	(Aa2)	keyname	1a	
3	(Aa3)	name		
4	(Aa4)	address		
5	(Aa5)			
6	(Aa6)			
7	(Aa7)			
8	(Aa8)	city		
9	(Aa9)	acctcode		
10	(Aa10)	amount		
11				

Equations for Page A

```
(Aa1): @Using qcdemo.accounts, find when keyname<>0;limit=100
(Aa2): @rereading, val of keyname
(Aa3): @rereading, val of description1
(Aa4): @rereading, val of address
(Aa5): @rereading, val of city
(Aa6): @rereading, val of state
(Aa7): @rereading, val of zip
(Aa8): $A5+", "+A6+" "+A7
(Aa9): @rereading, val of acctcode
(Aa10): @Using qcdemo.invoices, sum of amount when acctcode is [a9]
```

The /PRINTEQ equations for Page A

Pages A & B of the file DEMORPRT are almost identical. The only difference between the two pages is that page A uses the default layout format created by QueryCalc while page B uses an edited formatting structure that was put together in just a few minutes. The two layout files (QCREPRTA and QCREPRTB) and their resulting outputs appear on the following pages.

There is an important take-home-lesson in this first example: *Do not confuse a single-group report with single-dataset access.* The example above accesses two datasets, ACCOUNTS and INVOICES. The datasets are related by the dataitem ACCTCODE, which appears in both datasets. A second group

would be necessary only if you wanted a detail listing of each invoice from each vendor, not simply a summarization as used here.

Cell A9 of the report page retrieves the dataitem ACCTCODE. This value is the "link" between datasets. Although its retrieval is necessary to join the information in the two datasets, it is not necessary that the linking item be given a name in Column B. If you did not need ACCTCODE to appear on the printed report, nor wanted to use it as a sorting key, then no reason exists for you to give it a specific name.

The names you choose for Column B are arbitrary. They do not have to reflect the dataitems being retrieved. Those values which are named are the values which will be written onto the intermediate flat file. The values can be the direct results of query questions (as in line A2) or the calculated results of text and numeric equations (as in line A8).

The list generator in QueryCalc is built using the same basic ideas employed in the UDQFs (user defined query functions). Each group level follows this basic pattern:

- The first line of a new group will always be a @FIND query question. This query identifies the records to be selected. *If the group level is greater than the first level, a portion of the qualifying requirements for the @FIND are expected to come from the information in the group level immediately above it.*
- Cells filled with @REREADINGS will then follow, extracting required dataitems from the dataset being searched by the @FIND. Before the /REPORT page is executed, QueryCalc compiles the page. *For the sake of computational efficiency, it is best to group all of the @REREADINGS together.*
- Following the @REREADINGS may come numeric equations, text equations and other summarizing query questions referencing other datasets and databases.

13-10 / Detail List Reports

keyname	name	ad
ADAMSMOULDING	ADAMS MOULDING & LUMBER CO. INC.	13
ADDCO	ADDCO MILLWORK	13
ADVENTURE	ADVENTURE TRAVEL AGENCY, INC.	13
AICS	AICS	13
ALLEY	ALLEY-CONNELL & ASSOCIATES	13
ALLREDSPECIAL	ALLRED'S AUTO SPECIALTIES	13
AMERICANLINEN	AMERICAN LINEN SUPPLY	13
AMIGO	AMIGO LEASING, INC.	13
APSCO	ALAMO PIPE & SUPPLY CO., INC.	13
ARGYLE	ARGYLE WELDING & MEDICAL SUPPLY CO.	13
BLUPRINTS	BLUEPRINTS & MAPS INC.	13
BOTSFORD	BOTSFORD LAND SURVEYING INC.	13
BURKE	THE BURKE COMPANY	13
CASH	PETTY CASH	13
CENTURYDOOR	WDC DOOR CORPORATION	13
CONSTRSPECIAL	CONSTRUCTION SPECIALTIES SUPPLIERS	13
CORDELL	CORDELL PAVING COMPANY	13
DASAVINGS	DONA ANA SAVINGS & LOAN ASSOCIATION	13
DGUILLEN	DANIEL S. GUILLEN	13
DODGEREPORTS	F.W. DODGE DIVISION	13
DONCUMMINGS	DON J. CUMMINGS CO., INC.	13
DUMMY	JOURNAL ENTRY	13
ELDER	ELDER EQUIPMENT LEASING, INC.	13
EPMACHINE	EL PASO MACHINE & STEEL CO.	13
FALCON	FALCON SPRINKLER SYSTEMS, INC.	13
FEDEXPRESS	FEDERAL EXPRESS CORPORATION	13
FIESTAPOOL	FIESTA POOLS	13
FRONTIER	FRONTIER ROOFING CO. OF EL PASO	13
G&GFLOOR	G & G FLOOR COVERINGS	13
GASCO	GAS COMPANY OF NEW MEXICO	13
GE	GENERAL ELECTRIC COMPANY	13
GLOVER	GLOVER PLUMBING & HEATING CO., INC.	13

QCREPRTA

```

10  GROUP 1
20  H
30  H,"keyname",1;"name",39;"address",77;"city",115;"acctcode",-160&
    ;"amount",-170
40  H
50  D,KEYNAME,1;NAME,39;ADDRESS,77;CITY,115;ACCTCODE,-160;AMOUNT,-170
60  F,"-----",-160;"-----",-170
70  F,ACCTCODE,-160,SUM;AMOUNT,-170,SUM
80  F
90  ENDGROUP

```

The printout and default layout format (QCREPRTA) for Page A. QueryCalc automatically trims the printed line to the width of the margins specified in /MARG. The 36-character widths associated with the first several items results from the default width being assigned to text items. Footer sums are automatically generated in the default layout format for all numeric items.

ADAMSMOULDING	ADAMS MOULDING & LUMBER CO. INC. 1313 EAST MOCKINGBIRD UNIVERSITY PARK, NM 88003 AMOUNT: 3,606.82	ACCOUNT CODE: 346
ADDCO	ADDCO MILLWORK 1313 EAST MOCKINGBIRD UNIVERSITY PARK, NM 88003 AMOUNT: 44,403.79	ACCOUNT CODE: 22
ADVENTURE	ADVENTURE TRAVEL AGENCY, INC. 1313 EAST MOCKINGBIRD UNIVERSITY PARK, NM 88003 AMOUNT: 514.00	ACCOUNT CODE: 463
AICS	AICS 1313 EAST MOCKINGBIRD UNIVERSITY PARK, NM 88003 AMOUNT: 21,723.42	ACCOUNT CODE: 115
ALLEY	ALLEY-CONNELL & ASSOCIATES 1313 EAST MOCKINGBIRD UNIVERSITY PARK, NM 88003 AMOUNT: 1,276.40	ACCOUNT CODE: 145

```

QCREPRTB
10 GROUP 1
20 d,"-----&
   -----",1;unify 6
30 d
40 D,KEYNAME,1;NAME,20;"ACCOUNT CODE:",-70;acctcode,72
50 d,address,20
60 d,city,20
70 d,"AMOUNT:",20;amount,28
80 d
90 endgroup

```

The printout and modified layout format (QCREPRTB) for Page B. The header lines were eliminated and data item values were redistributed on the report. The report layout is now composed solely of detail lines. In a layout file, each line of H, D or F indicates one print line. A strict requirement is that each group's lines must have all of the H's together, followed by all of the D's and then all of the F's. The syntax checker in QueryCalc's editor will insure that this required order is observed. Notice that type case (upper or lower) is unimportant in the layout file.

How to Build a Detail List Report Step-by-Step

1. Go to the spreadsheet page you wish to make a report page and type /REPORT.
2. Enter the first @FIND equation. You will find it easiest to work with real data, so terminate the @FIND with an "!" to cause your query to execute immediately. If the @FIND is likely to take some time, append a temporary LIMIT clause to the end of the query statement to limit the number of records you will find.
3. Proceeding down Column A, enter the @REREADING cells, terminating each query with an "!". Format the cells (using /FORM) in the fashion you wish the data to appear on the report.
4. Enter any other summary queries from other databases or datasets in Column A.
5. If you desire more complex results derived from several of the query values, enter the necessary equations in Column A.
6. If another group level of detail is necessary, enter the second @FIND equation. A portion of the qualifying requirements should come from information in the cells of the immediately preceding group. Repeat the procedure in Steps 2 to 5.
7. Go to Column B and provide names (typed in as text labels) for those items you wish to appear on the printed report or which will be used as sort items.
8. Go to Column C and optionally enter the sort order (typed in as text labels). Nine sort levels (1 through 9) can be specified within each group.
9. Go to Column D and optionally enter any width values you wish to change from the default values of 36 characters for text and 10 characters for numbers.

10. Recalculate the report page by typing "!!"
11. /PRINT the report to see the results of your first try.
12. Type /LAYOUT to modify the default layout format.
13. /PRINT the modified report. Repeat steps 12 & 13 until you are satisfied with the results.

The Types of Lines Which May Appear in a Layout File

The line types which are allowed in a **/LAYOUT** file are these:

GROUP	BREAKON
H (header lines)	ENDBREAK
D (detail lines)	ONNEWPAGE
F (footer lines)	ENDPAGE
ENDGROUP	

Header lines are composed of only text labels, print positions, and optionally, print enhancement requests.

```
H
H,"Date",30;"Amount",-50,b0,s2
H,"The Bayard Company, Ltd.",c
```

A single letter "H" indicates a blank print line in the headers. A header line with quoted text followed by a positive number indicates that the text is to be left justified, beginning at the position indicated. A negative number indicates that the text is to be right justified, the rightmost character to be placed at the position indicated, with the text going "backwards". Other acceptable print position values are R,L, and C. "L" left justifies text at print position of 1. "R" right justifies text at the current right margin (as set in /MARG). "C" center justifies the text between the present left and right margin settings. These print position conventions are used in all of three line types (H,D,F).

The optional *print enhancement codes* are the same codes used for spreadsheet cell enhancements (bold, underlining, font changes, etc.) (see Chap. 8, "Printing"). As with cell enhancements, the print enhancement tends to

stay on once its been turned on, although this behavior varies a bit from printer type to printer type. In general, you must turn the enhancement off at the next printable item if you do not want it to continue indefinitely.

Detail lines are basically the same as header lines, but with the optional addition of the item values named on the /REPORT page.

```
D
D,"Category:",-60;CATEGORY,62
D,"-----item separator-----",c
D,date,14,nr;amount,-30
```

A detail line may be composed of either simple text (denoted by quotes) or item value names (no quotes). The format is otherwise identical to header lines, with one exception. The value "NR" may also be added to any detail line. "NR" means non-repeating. An example appears in the last line of the four lines above. Should the same date value immediately recur, the date value will be printed only the first time it appears. Because NR was not specified for the amount value, every value of amount will be printed. The result will look like this:

1/14/93	12,237.33
	6,781.01
	34,676.00
1/16/93	45.12
	123.89
	18,345.40

Footer lines are similar to detail lines. They may be composed of either simple text or item value names.

```
F
F,"-----",-60;"-----",-80
F,"Grand Total: ",-48;AMOUNT,-60,sum;&
BALANCE,-80,sum,b1;"",-81,b0
```

Simple text only has one necessary parameter: print position. A summarized report item value has two: (1) print position and (2) the summarization type to be accumulated (sum, num, avg, max, min, var, or dev). As with header and detail lines, footer lines may also be enhanced. In the example above, BALANCE is printed in bold. [Notice that the bold enhancement request (b1) is turned off in the next print item (b0), an empty text string].

Layout Print Control Structures

Five print control structures for detail list reports exist in QueryCalc. Four of them are phrases used in header, detail or footer lines:

NEWPAGE
RESET 15
UNIFY 6
SKIPTO 5

The fifth is a conditional clause used in the /LAYOUT file:

ONNEWPAGE
•
ENDPAGE

NEWPAGE, when placed anywhere within a printable line, causes the printer to skip to the top of a new page before the line is printed.

RESET 15, when placed anywhere within a printable line, causes the page number of the current page to be reset to the number specified.

UNIFY 6, when placed anywhere in a line, requires that at least 6 full print lines remain before bottom of page or the printer will be commanded to skip to the next page. The effect is that the present line and the following five lines will always be printed as a whole. Any positive integer may be specified in the UNIFY command. Negative numbers or numbers larger than or equal to the number of printable lines on the page (as set in /MARG) will be ignored. The UNIFY command stays in effect only for the duration of printing of the line in which it appears.

SKIPTO 55, when placed anywhere in a line, causes the printer to skip print row 55 before the line is printed. If the requested print row has already been passed, the printer will skip to the next page and go to the requested print row on that page. Negative line numbers or numbers larger than the number of printable lines on a page (as set in /MARG) will be ignored.



Should you request both **NEWPAGE** and **SKIPTO** in the same line, the order of execution will be first **NEWPAGE** and then **SKIPTO**. That is, the printer will first go the top of the next page and then skip down to the requested print row before the line is printed. Should you request both **UNIFY** and **SKIPTO** in the same line, **UNIFY** overrides **SKIPTO**. That is, if you request a

skip to a print row within the number of page bottom rows protected by UNIFY, UNIFY will cause the printer to skip to the top of the next page.

The Conditional Print Control Clause

ONNEWPAGE is a conditional clause. ONNEWPAGE causes a secondary header to be printed at the top of each continuation page. ONNEWPAGE takes effect only when the report fills the current page and the printer "walks" into a new page. That may occur because either too much information has been retrieved to fit on the current page or the SKIPTO phrase has caused the printer a skip to the next page. The ONNEWPAGE clause, it should be noted, is not activated on a NEWPAGE command. Indeed, NEWPAGE resets the ONNEWPAGE trigger.

A different ONNEWPAGE clause may be specified for each group in the report. If no ONNEWPAGE clause is specified for the group level currently printing, the last ONNEWPAGE encountered will be the one used.

The rules for using the ONNEWPAGE clause are these:

1. Only header line types are allowed in an ONNEWPAGE clause.
2. The ONNEWPAGE clause is always placed at the end of a group, just prior to the ENDGROUP command.
3. An ONNEWPAGE set of header lines used in a lower group can be cleared by setting a null ONNEWPAGE clause in a higher group (that is, the ONNEWPAGE command is followed immediately by an ENDPAGE command).

Examples of all of the print control structures are used in Pages C & D of DEMORPRT, sections of which appear in the next several pages.

Global Headers & Footers

Global headers and footers for each report page (such as the footer page number in the example file, DEMORPRT) are set as they would normally be set for spreadsheet pages, in the /HEAD screen. And as they do for spreadsheet pages, headers and footers diminish the number of printable lines on the page by the number of lines they take up.

Example 2: A Two-Group Expense Report

Pages C & D of DEMORPRT are identical pages, other than their layout files. The detail lists they generate are a list of all occupancy expenses for the year 1984. The report page is organized as two groups, one which extracts each category of expense, the other each invoice which occurred within 1984 for that category. The categories are sorted by name. The invoices are sorted by date. Three datasets are accessed by the report.

C	_____ equation (a)_____	___name (b)___	__sort (c)__	__width (d)
1	_____	find when category ib 500,600_____		
2		(Ca2)		
3		(Ca3)		
4		(Ca4)	category	1a 25
5	_____	find when category is [a2] and date ib 8...		
6		(Ca6)	comdate	1a 10
7		(Ca7)	amount	
8		(Ca8)	balance	
9		(Ca9)		
10		(Ca10)		
11		(Ca11)	supplier	30
12		(Ca12)	date	15
13				

Equations for Page C

```
(Ca1): @Using qcdemo.categories, find when category ib 500,600
(Ca2): @rereading, val of category
(Ca3): @rereading, val of description1
(Ca4): $NAM$(A3)
(Ca5): @Using qcdemo.invoices, find when category is [a2] and
       date ib 840000,850000
(Ca6): @rereading, val of date
(Ca7): @rereading, val of amount
(Ca8): @rereading, val of balance
(Ca9): @rereading, val of acctcode
(Ca10): @Using qcdemo.accounts, val of description1 when
        acctcode is [A9]
(Ca11): $NAM$(A10)
(Ca12): $DAT$4(A6)
```

The /PRINTEQ equations for Page C

Two cells, A2 and A9, are used to retrieve information (expense category number and account code) which is used to link datasets together. Neither cell is named in Column B. There is no need to name these cells because this linking information will neither need to appear on the printed report or be used in sorting.

```

QCREPRTC
 10     GROUP 1
 20     H
 30     H, "category", 1
 40     H
 50     D, CATEGORY, 1
 60     GROUP 2
 70     H
 80     H, "compdate", 4; "amount", -23; "balance", -33; "supplier", 36; "date", 68
 90     H
100     D, COMPDATE, 4; AMOUNT, -23; BALANCE, -33; SUPPLIER, 36; DATE, 68
110     F, "-----", -23; "-----", -33
120     F, AMOUNT, -23, SUM; BALANCE, -33, SUM
130     F
140     ENDGROUP
150     F
160     F
170     F
180     ENDGROUP

```

The default layout format (QCREPRTC) for Page C. The default format automatically generates sums of all of the numeric items within a group. The default format also automatically indents each new group two spaces to the right.

Items are presented in the default format in the order that they appear on the /REPORT page. The item COMPDATE was given a name not because it was desired to have it on the printed report, but because its presence was necessary for sorting. One of the first items to be modified in the layout in Page D was to drop COMPDATE and move DATE to take its place.

category

Building Maintenance

comdate	amount	balance	supplier	date
840101	100.00	0.00	Ccc Investments	JAN 01 84
840201	100.00	0.00	Ccc Investments	FEB 01 84
840301	100.00	0.00	Ccc Investments	MAR 01 84
840401	100.00	0.00	Ccc Investments	APR 01 84
840418	10.40	0.00	Marion H. Phares	APR 18 84
840429	51.21	0.00	Home Centers/Western Region	APR 29 84
840501	100.00	0.00	Ccc Investments	MAY 01 84
840524	71.96	0.00	Ccc Investments	MAY 24 84
840531	166.27	0.00	Ccc Investments	MAY 31 84
840701	100.00	0.00	Ccc Investments	JUL 01 84
840724	152.21	0.00	Hargraves Drilling	JUL 24 84
840801	100.00	0.00	Ccc Investments	AUG 01 84
840802	34.35	0.00	Metal Craft Company	AUG 02 84
840831	59.90	0.00	Metal Craft Company	AUG 31 84
	-----	-----		
	1,246.30	0.00		

Cleaning Service

comdate	amount	balance	supplier	date
840103	15.00	0.00	Natalia Vasquez	JAN 03 84
840109	15.00	0.00	Natalia Vasquez	JAN 09 84
840116	15.00	0.00	Natalia Vasquez	JAN 16 84
840123	15.00	0.00	Natalia Vasquez	JAN 23 84
840130	10.00	0.00	Natalia Vasquez	JAN 30 84
840206	15.00	0.00	Natalia Vasquez	FEB 06 84
840213	15.00	0.00	Natalia Vasquez	FEB 13 84
840220	15.00	0.00	Natalia Vasquez	FEB 20 84
840227	20.00	0.00	Natalia Vasquez	FEB 27 84
840305	15.00	0.00	Natalia Vasquez	MAR 05 84
840312	20.00	0.00	Natalia Vasquez	MAR 12 84
840319	15.00	0.00	Natalia Vasquez	MAR 19 84
840326	15.00	0.00	Natalia Vasquez	MAR 26 84
840403	10.00	0.00	Natalia Vasquez	APR 03 84
840409	10.00	0.00	Natalia Vasquez	APR 09 84
840416	20.00	0.00	Natalia Vasquez	APR 16 84
840423	15.00	0.00	Natalia Vasquez	APR 23 84
840430	20.00	0.00	Natalia Vasquez	APR 30 84
840507	20.00	0.00	Natalia Vasquez	MAY 07 84
840515	10.00	0.00	Natalia Vasquez	MAY 15 84
840521	10.00	0.00	Natalia Vasquez	MAY 21 84
840529	15.00	0.00	Natalia Vasquez	MAY 29 84
840604	15.00	0.00	Natalia Vasquez	JUN 04 84
840611	20.00	0.00	Natalia Vasquez	JUN 11 84
840618	15.00	0.00	Natalia Vasquez	JUN 18 84
840627	15.00	0.00	Natalia Vasquez	JUN 27 84
840702	10.00	0.00	Natalia Vasquez	JUL 02 84
840710	10.00	0.00	Natalia Vasquez	JUL 10 84

13-20 / Detail List Reports

```

QCREPRTD
100  GROUP 1
110    d,newpage;"-----&
        -----",1
120    d
130    d,"UniCon Construction, Ltd",c,b1,s2
140    d,"University Park, New Mexico",c
150    d," ",1,b0,s0
160    d,"-----&
        -----",1
170    d
180    D,"Category:",1;CATEGORY,11,m2;" ",r,m1
190  GROUP 2
200    H
210    H,"date",4;"amount",-23;"balance",-33;"supplier",36
220    H
230    D,unify 3;DATE,4;AMOUNT,-23;BALANCE,-33;SUPPLIER,36,m2;" ",m1,r
240    f,"-----",-23;"-----",-33
250    f,"Total:",-13;amount,-23,sum;balance,-33,sum
260    f
270    f,skipto 50;"Count:",-53;amount,-63,num;balance,-73,num
280    f,"Average:",-53;amount,-63,avg;balance,-73,avg
290    f,"Maximum:",-53;amount,-63,max;balance,-73,max
300    f,"Minimum:",-53;amount,-63,min;balance,-73,min
310    f,"Variance:",-53;amount,-63,var;balance,-73,var
320    f,"Deviation:",-53;amount,-63,dev;balance,-73,dev
330    F
340  ONNEWPAGE
350    h,"-----&
        -----",1
360    h
370    h,"UniCon Construction, Ltd",c,b1,s2
380    h,"University Park, New Mexico",c
390    h," ",b0,s0
400    h,"-----&
        -----",1
401    h,skipto 9
410  ENDPAGE
420  ENDGROUP
430  f,newpage;skipto 50;"-----
        -----",1
440  f
450  f,"Total:",-13;amount,-23,sum;balance,-33,sum;"GRAND TOTALS",r
460  f
470  f,"Count:",-13;amount,-23,num;balance,-33,num
480  f,"Average:",-13;amount,-23,avg;balance,-33,avg
490  f,"Maximum:",-13;amount,-23,max;balance,-33,max
500  f,"Minimum:",-13;amount,-23,min;balance,-33,min
510  f,"Variance:",-13;amount,-23,var;balance,-33,var
520  f,"Deviation:",-13;amount,-23,dev;balance,-33,dev
530  ENDGROUP

```

The modified layout format (QCREPRTD) for page D.

UniCon Construction, Ltd
University Park, New Mexico

Category: *Building Maintenance*

date	amount	balance	supplier
JAN 01 84	100.00	0.00	<i>Ccc Investments</i>
FEB 01 84	100.00	0.00	<i>Ccc Investments</i>
MAR 01 84	100.00	0.00	<i>Ccc Investments</i>
APR 01 84	100.00	0.00	<i>Ccc Investments</i>
APR 18 84	10.40	0.00	<i>Marion H. Phares</i>
APR 29 84	51.21	0.00	<i>Home Centers/Western Region</i>
MAY 01 84	100.00	0.00	<i>Ccc Investments</i>
MAY 24 84	71.96	0.00	<i>Ccc Investments</i>
MAY 31 84	166.27	0.00	<i>Ccc Investments</i>
JUL 01 84	100.00	0.00	<i>Ccc Investments</i>
JUL 24 84	152.21	0.00	<i>Hargraves Drilling</i>
AUG 01 84	100.00	0.00	<i>Ccc Investments</i>
AUG 02 84	34.35	0.00	<i>Metal Craft Company</i>
AUG 31 84	59.90	0.00	<i>Metal Craft Company</i>
	-----	-----	
Total:	1,246.30	0.00	

Count:	14.00	14.00
Average:	89.02	0.00
Maximum:	166.27	0.00
Minimum:	10.40	0.00
Variance:	1,734.08	0.00
Deviation:	41.64	0.00

Printing to Preprinted Forms

The printout for Page D looks very much like the format which would be used to fill in a standard invoice. With the use of the `SKIPTO` command phrase, printing can be commanded to occur at any specific location on a preprinted form. Because you rarely know beforehand how many items will fill the invoice, the use of the `UNIFY` command phrase will allow you to set an artificial "bottom of page", thus protecting a print area which would normally contain summations, taxes, etc. Using the `ONNEWPAGE` clause, a continuation header can be printed at the top of each new page of an invoice which has too many items to fit on just one page.

Similarly, filling out other preprinted forms, such as W-2 reports, unemployment reports, wage withholding reports, etc. are as easily done.

Check Registers & Repeating Dataitems

Check reconciliation registers are also readily programmable. In a check register, items from several groups are often desired to be printed on the same line. That's possible in QueryCalc, given a few constraints. The first constraint is that higher group level items can be printed in lower groups, but the reverse is not true (the reason: a higher group value will always be known by the time the lower group element is to be printed, but QueryCalc cannot know in advance the value of the lower group item before it is encountered). The syntax checker in `/LAYOUT` will prevent you from describing a format so that you would violate this rule. The second constraint is that all of the items must be capable of appearing on the same line(s). There is no way in QueryCalc for you to have a column of check amounts printed at the right and on the left print a shorter multi-line description of the account, such that both columns will be flush at the top. To do that would require multiple data files with synchronizing print control structures, a feature QueryCalc does not possess.

However the use of the non-repeating (**NR**) modifier offers a range of possibilities. The default layout of Page C (`DEMORPRT`) was modified to produce the output on the opposite page. The item value `CATEGORY`, a Group 1 item, has been moved down to Group 2. This will cause the current value of `CATEGORY` to be printed on every Group 2 line. By specifying the **NR** modifier for `CATEGORY`, its value is only printed once at every group value change. This allows different group item values to be printed simultaneously on the same line. Notice too that the `SUPPLIER` item value is also printed with the **NR** modifier. This allows the opportunity to easily recognize a change in vendors.

Category	Date	Amount	Balance	Supplier
Building Maintenance	JAN 01 84	100.00	0.00	Ccc Investments
	FEB 01 84	100.00	0.00	
	MAR 01 84	100.00	0.00	
	APR 01 84	100.00	0.00	
	APR 18 84	10.40	0.00	Marion H. Phares
	APR 29 84	51.21	0.00	Home Centers/Western R
	MAY 01 84	100.00	0.00	Ccc Investments
	MAY 24 84	71.96	0.00	
	MAY 31 84	166.27	0.00	
	JUL 01 84	100.00	0.00	
	JUL 24 84	152.21	0.00	Hargraves Drilling
	AUG 01 84	100.00	0.00	Ccc Investments
	AUG 02 84	34.35	0.00	Metal Craft Company
	AUG 31 84	59.90	0.00	
Cleaning Service	JAN 03 84	15.00	0.00	Natalia Vasquez
	JAN 09 84	15.00	0.00	
	JAN 16 84	15.00	0.00	
	JAN 23 84	15.00	0.00	
	JAN 30 84	10.00	0.00	
	FEB 06 84	15.00	0.00	
	FEB 13 84	15.00	0.00	
	FEB 20 84	15.00	0.00	
	FEB 27 84	20.00	0.00	
	MAR 05 84	15.00	0.00	
	MAR 12 84	20.00	0.00	
	MAR 19 84	15.00	0.00	
	MAR 26 84	15.00	0.00	
	APR 03 84	10.00	0.00	
	APR 09 84	10.00	0.00	
	APR 16 84	20.00	0.00	
APR 23 84	15.00	0.00		

```

QCREPRTC
10  GROUP 1
20  H
30  H,"Category",1;"Date",27;"Amount",-45;"Balance",&
    -55;"Supplier",57
40  H
50  GROUP 2
60  D,CATEGORY,1,NR;DATE,27;AMOUNT,-45;BALANCE,&
    -55;SUPPLIER,57,NR
70  F
80  ONNEWPAGE
90  H
100 H,"Category",1;"Date",27;"Amount",-45;"Balance",&
    -55;"Supplier",57
110 H
120 ENDPAGE
130 ENDGROUP
140 ENDGROUP

```

Control Breaks

Quite often, you will need to impose additional subtotals and print controls in the report that can't be generated by a group break. Consider the single group report shown here:

F	_____equation (a)_____	____name (b)____	__sort (c)__	__width (d)
1	_____ find when jobnum is 8404 _____			
2	(Fa2)			
3	(Fa3)		2a	10
4	(Fa4)	amount		
5	(Fa5)	company	1a	20
6	(Fa6)	date		10
7	(Fa7)	year		

```
(Fa1): @Using qcdemo.invoices, find when jobnum is 8404
(Fa2): @rereading, val of acctcode
(Fa3): @rereading, val of date
(Fa4): @rereading, val of amount
(Fa5): @Using qcdemo.accounts, val of keyname when acctcode
       is [a2]
(Fa6): $DAT$5(A3)
(Fa7): YEAR(A3)
```

Four items, ACCTCODE, DATE, AMOUNT, and YEAR, are generated on the report page. The only total that's possible without a control break is a group total, as seen in the layout file below. But what we require are company totals to be inserted when the company name changes.

```
QCREPRTF
 10  GROUP 1
 20  H, "-----", 1
 30  H, "company", 1; "date", 23; "amount", -42
 40  H, "-----", 1
 50  H
 60  D, COMPANY, 1, NR; DATE, 23; AMOUNT, -42
 70  F, "-----", -42
 80  F, "job total:", -30; AMOUNT, -42, SUM
 90  F
100  ONNEWPAGE
110  H, "-----", 1
120  H, "company", 1; "date", 23; "amount", -42
130  H, "-----", 1
140  H
150  ENDPAGE
160  ENDGROUP
```

The layout file without control breaks.

company	date	amount
ARTGLASS	01-MAR-95	1,321.45
	30-APR-95	317.00
BORDERMACHINE	26-FEB-95	46.09
BOTSFORD	30-APR-94	256.94
	01-JUN-95	73.33
BUILDERSBLOCK	25-APR-94	158.06
	31-MAY-94	16.68
	25-JUN-94	2,487.22
	25-AUG-94	15,372.90
	25-AUG-94	6,441.00
	25-SEP-94	2,660.00
	25-SEP-94	11.18
	25-OCT-94	28,311.90
	25-OCT-94	12,001.35
	25-NOV-94	24,852.00
	25-DEC-94	5.50
	25-DEC-94	11,207.15
	25-JAN-95	11,044.70
	25-JAN-95	21.24
	25-FEB-95	22.36
	25-FEB-95	13,841.50
	25-FEB-95	1,500.32
	25-FEB-95	550.00
	24-MAY-95	9,424.23
	25-MAY-95	21.08
	25-MAY-95	299.53
	25-MAY-95	1,491.50
	25-JUL-95	18.00
BURNCO	04-APR-94	42,481.80
	03-MAY-94	12,234.60
	05-JUN-94	2,833.65
	06-SEP-94	1,450.35
	06-SEP-94	10,053.00
	12-MAR-95	31,476.60
BUSINESSPROD	10-APR-95	23.13
CAMERASHOP	26-MAR-94	4.17
	01-MAY-94	25.66
CASHWAY	27-JAN-94	35.01
	26-FEB-94	49.43
	29-APR-94	51.38
	27-MAY-94	64.40
	01-JUL-94	61.03
	01-JUL-94	13.11
	29-JUL-94	47.76
	26-AUG-94	7.54

The printout of a single group report without control breaks.

The BREAKON Clause

A control break may be typed into the layout file in the following fashion:

```
D , COMPANY , 1 , NR ; DATE , 23 ; AMOUNT , -42
BREAKON COMPANY
    F , "-----" , -42
    F , AMOUNT , -42 , SUM
    F
ENDBREAK
F
```

The **BREAKON** clause is triggered by a change in the dataitem specified. The process is somewhat similar in effect to the non-repeating modifier (**NR**) that was discussed just a few pages ago.

```
QCREPRTF
10  GROUP 1
20  H , "-----" , 1
30  H , "company" , 1 ; "date" , 23 ; "amount" , -42
40  H , "-----" , 1
50  H
60  D , UNIFY 8 ; COMPANY , 1 , NR ; DATE , 23 ; AMOUNT , -42
70  BREAKON COMPANY
80  F , "-----" , -42
90  F , "company total:" , -30 ; AMOUNT , -42 , SUM
100 F , "company average:" , -30 ; AMOUNT , -42 , AVG
110 F
120 F , "-----" , 1
130 F
140 ENDBREAK
150 F , "-----" , -42
160 F , "job total:" , -30 ; AMOUNT , -42 , SUM
170 F
180 ONNEWPAGE
190 H , "-----" , 1
200 H , "company" , 1 ; "date" , 23 ; "amount" , -42
210 H , "-----" , 1
220 H
230 ENDPAGE
240 ENDGROUP
```

The layout file has now been modified to have one control break. The resulting output is shown on the opposite page. The /REPORT page was not recalculated to generate this new printout. Only the layout file was modified.

company	date	amount

BOTSFORD	30-APR-94	256.94
	01-JUN-95	73.33

	company total:	330.27
	company average:	165.14

BUILDERSBLOCK	25-APR-94	158.06
	31-MAY-94	16.68
	25-JUN-94	2,487.22
	25-AUG-94	15,372.90
	25-AUG-94	6,441.00
	25-SEP-94	2,660.00
	25-SEP-94	11.18
	25-OCT-94	28,311.90
	25-OCT-94	12,001.35
	25-NOV-94	24,852.00
	25-DEC-94	5.50
	25-DEC-94	11,207.15
	25-JAN-95	11,044.70
	25-JAN-95	21.24
	25-FEB-95	22.36
	25-FEB-95	13,841.50
	25-FEB-95	1,500.32
	25-FEB-95	550.00
	24-MAY-95	9,424.23
	25-MAY-95	21.08
	25-MAY-95	299.53
	25-MAY-95	1,491.50
	25-JUL-95	18.00

	company total:	141,759.40
	company average:	6,163.45

BURNCO	04-APR-94	42,481.80
	03-MAY-94	12,234.60
	05-JUN-94	2,833.65
	06-SEP-94	1,450.35
	06-SEP-94	10,053.00
	12-MAR-95	31,476.60

	company total:	100,530.00

The report with one control break.

Multiple Control Breaks

Multiple control breaks may be specified for a single report. The breaks are typed in a nested order such that the item that changes most often is specified first and the most major summarization appears last. A 2-break example is shown here:

```

QCREPRTF
 10  GROUP 1
 20  H, "-----" , 1
 30  H, "company" , 1 ; "date" , 23 ; "amount" , -42
 40  H, "-----" , 1
 50  H
 60  D, UNIFY 8 ; COMPANY , 1 , NR ; DATE , 23 ; AMOUNT , -42
 70  BREAKON YEAR
 80  F, "-----" , -52
 90  F, AMOUNT , -52 , SUM
100  F
110  BREAKON COMPANY
120  F, "company total:" , -40 ; AMOUNT , -52 , SUM
130  F, "company average:" , -40 ; AMOUNT , -52 , AVG
140  F
150  F, "-----" , 1
160  F
170  ENDBREAK
180  ENDBREAK
190  F, "-----" , -52
200  F, "job total:" , -40 ; AMOUNT , -52 , SUM
210  F
220  ONNEWPAGE
230  H, "-----" , 1
240  H, "company" , 1 ; "date" , 23 ; "amount" , -42
250  H, "-----" , 1
260  H
270  ENDPAGE
280  ENDGROUP

```

The layout file modified a second time. Two control breaks are now used, the first (minor) for the year and the second (major) for the company. Notice that YEAR is a dataitem that was calculated on the /REPORT page but is not otherwise used in the layout. This is perfectly legitimate.

company	date	amount
BUILDERSBLOCK	25-APR-94	158.06
	31-MAY-94	16.68
	25-JUN-94	2,487.22
	25-AUG-94	15,372.90
	25-AUG-94	6,441.00
	25-SEP-94	2,660.00
	25-SEP-94	11.18
	25-OCT-94	28,311.90
	25-OCT-94	12,001.35
	25-NOV-94	24,852.00
	25-DEC-94	5.50
	25-DEC-94	11,207.15

		103,524.94
	25-JAN-95	11,044.70
	25-JAN-95	21.24
	25-FEB-95	22.36
	25-FEB-95	13,841.50
	25-FEB-95	1,500.32
	25-FEB-95	550.00
	24-MAY-95	9,424.23
	25-MAY-95	21.08
	25-MAY-95	299.53
	25-MAY-95	1,491.50
	25-JUL-95	18.00

		38,234.46
	company total:	141,759.40
	company average:	6,163.45
BURNCO	04-APR-94	42,481.80
	03-MAY-94	12,234.60
	05-JUN-94	2,833.65
	06-SEP-94	1,450.35
	06-SEP-94	10,053.00

		69,053.40
	12-MAR-95	31,476.60

		31,476.60

The report with control breaks for year and company.

Suppressing Detail Lines

In a "flat", one-group report, you may often wish to not only generate control break summaries, but also suppress the detail entries that contribute to those summary values. The suppression of this unwanted information can be accomplished with the use of the "print-once" (**PO**) modifier as shown in line 60 of the /LAYOUT file below. The PO modifier works similarly to the NR modifier, but with PO, all further detail lines will be suppressed from printing until the specified item changes in value.

```

QCREPRTF
 10  GROUP 1
 20  H, "-----" ,1
 30  H, "company",1;"year",-40;"amount",-52
 40  H, "-----" ,1
 50  H
 60  D,UNIFY 8;COMPANY,1,PO
 70  D,ADDRESS,1
 80  BREAKON YEAR
 90  F, YEAR, -40;AMOUNT, -52,SUM
100  BREAKON COMPANY
110  F
120  F, "total:", -40;AMOUNT, -52,SUM
130  F, "average invoice:", -40;AMOUNT, -52,AVG
140  F
150  F, "-----" ,1
160  F
170  ENDBREAK
180  ENDBREAK
190  F, "-----" , -52
200  F, "job total:", -40;AMOUNT, -52,SUM
210  F
220  ONNEWPAGE
230  H, "-----" ,1
240  H, "company",1;"year",-40;"amount",-52
250  H, "-----" ,1
260  H
270  ENDPAGE
280  ENDGROUP

```

The layout file modified a third time. The control breaks in this example are only very slightly modified from the previous example, but the detail lines have been print-suppressed. The detail lines now print only once, when the company name changes, the same condition that the major control break operates on.

company	year	amount

BORDERMACHINE		
4545 E. AMADOR, LAS CRUCES 88001		
	1995	46.09
	total:	46.09
	average invoice:	46.09

BOTSFORD		
1326 FENTON, UNIVERSITY PARK 88003		
	1994	256.94
	1995	73.33
	total:	330.27
	average invoice:	165.14

BUILDERSBLOCK		
1200 LOHMAN, LAS CRUCES 88005		
	1994	103,524.94
	1995	38,234.46
	total:	141,759.40
	average invoice:	6,163.45

BURNCO		
HWY 70 AT EVANS, CHAMBERINO 88127		
	1994	69,053.40
	1995	31,476.60
	total:	100,530.00
	average invoice:	16,755.00

BUSINESSPROD		
12901 ESPINA, UNIVERSITY PARK 88003		
	1995	23.13
	total:	23.13
	average invoice:	23.13

Freedom of Suppress

If you wish to completely suppress the printing of detail lines, use the suppress (**SUPPRESS**) modifier. If the suppress modifier appears anywhere in a detail line, that line will not print.

When using the SUPPRESS modifier, you will almost certainly want the variable(s) that set the control break(s) to appear in one of the control break footer lines. In this example, YEAR appears in footer line 80 and COMPANY appears in line 110.

```

QCREPRTF
 10  GROUP 1
 20  H, "-----" ,1
 30  H, "company",1;"year",-40;"amount",-52
 40  H, "-----" ,1
 50  H
 60  D,UNIFY 8;SUPPRESS
 70  BREAKON YEAR
 80  F, YEAR,-40;AMOUNT,-52,SUM
 90  BREAKON COMPANY
100  F
110  F,COMPANY,1;"total:",-40;AMOUNT,-52,SUM
120  F,"average invoice:",-40;AMOUNT,-52,AVG
130  F
140  F, "-----" ,1
150  F
160  ENDBREAK
170  ENDBREAK
180  F, "-----" , -52
190  F, "job total:",-40;AMOUNT,-52,SUM
200  F
210  ONNEWPAGE
220  H, "-----" ,1
230  H, "company",1;"year",-40;"amount",-52
240  H, "-----" ,1
250  H
260  ENDPAGE
270  ENDGROUP

```

The layout file modified a fourth time. In this fourth example, the detail line has been completely suppressed from printing. However, the detail lines cannot simply be dropped. At least one detail line must still appear in the /LAYOUT file. No report variables need to appear on the detail line. Indeed, should they be present, they will merely represent wasted processing time.

company	year	amount
	1995	46.09
BORDERMACHINE	total:	46.09
	average invoice:	46.09
	1994	256.94
	1995	73.33
BOTSFORD	total:	330.27
	average invoice:	165.14
	1994	103,524.94
	1995	38,234.46
BUILDERSBLOCK	total:	141,759.40
	average invoice:	6,163.45
	1994	69,053.40
	1995	31,476.60
BURNCO	total:	100,530.00
	average invoice:	16,755.00
	1995	23.13
BUSINESSPROD	total:	23.13
	average invoice:	23.13
	1994	29.83
CAMERASHOP	total:	29.83
	average invoice:	14.91

The report modified so that detail lines have been completely suppressed.

Rules for Control Breaks

There are only a very few rules for the use of control breaks in a layout file. You do not need to memorize them. QueryCalc will, as it does elsewhere, warn you if you violate them.

- The BREAKON clause may appear only after the lowest group's last detail line and just before the lowest group's first footer line, as shown in the previous examples.
- The items summed in the BREAKON clause may only reference items in the lowest level group (referencing higher level groups makes no logical sense).
- The number of groups and control breaks cannot exceed a total of 5 levels.
- Only footer lines may appear in a BREAKON clause.
- Summations in a BREAKON clause are identical to standard footers, thus you may ask for either the SUM, AVG, MAX, MIN, DEV or VAR of the item (or any combination of these items in one or more footer lines).
- The BREAKON item does not need to be a sorted item on the /REPORT page, but a report would rarely have a control break specified for a non-sorted item.

Final Thoughts

Information for use in a report page may be extracted from any other cell in any spreadsheet or graphics definition page in the current file. However, the reverse is not true. In general, standard spreadsheet or graphic definition pages cannot extract information from a report page. The information in the cells of the report page is transitory and exists for only a short time. If you wish to use summarizations which were calculated during the course of calculation of a report page, no easy alternative exists but to recalculate those summaries in individual cells on a standard spreadsheet.

Concepts Introduced in Chapter 13

REPORT PAGE	the third page type in QueryCalc. The definition of a report page allows for the construction of a single, independent detail list report. Up to 26 such reports may be created in one QueryCalc file.
GROUP	a defined level of detail (one "indentation" in an outline). Sorting occurs within a group. A group is defined on a /REPORT page by a new @FIND statement.
"LINKING" ITEM	a dataitem value which is common to two or more datasets (in the same or different databases). The "linking" item value logically "relates" the different datasets.
LAYOUT FILE	the format description file
UNIFY	a command which demands that a specified number of print lines exist before the bottom of page is to be encountered, otherwise it commands a skip to the top of the next page and resumes the print there.
ONNEWPAGE	a conditional print clause which activates a secondary header whenever printing "walks" into a new page.
