

Spectrum Writer[®]

**Easy, Powerful
4GL Report Writer!**

**Spectrum Writer turns
any mainframe data into:**

Custom Reports & Files!

OR

ASCII Files for PCs!

OR

Web Reports!

Overview of Features Booklet

Table of Contents

Chapter 1. About Spectrum Writer	1
What Is Spectrum Writer?	1
Why You Need Spectrum Writer	1
Spectrum Writer Pays for Itself Fast!	2
Spectrum Writer Features	3
Chapter 2. Report Writing Examples	6
How to Produce a Report in 5 Minutes	6
How Spectrum Writer Works	8
Another Report Example	8
Using Multiple Input Files	10
A DB2 Example	12
Chapter 3. Creating ASCII Files	14
Why PC Formatting Is Necessary	14
How to Create a PC File in 5 Minutes	14
Translating the PC File to ASCII	16
Creating Native ASCII Files on the Mainframe	16
Chapter 4. Web Report Examples	18
How to Create a Web Report in 5 Minutes	18
Writing your own HTML Tags	20

Our Customers Say It Best!

"Everything we hoped it would be. In fact, I can honestly say it exceeded our initial expectations."

"Once you've used Spectrum Writer to prepare a few reports, you'll never go back to coding report programs in a 3GL."

"I can create reports in a few minutes. I don't know what I'd do without it."

"Spectrum Writer is a must-have tool for any installation that generates reports."

"It is easy to use, flexible and has all the features needed to produce virtually any type of report."

"The syntax is straightforward, the documentation is good, the support is good."

Copyright 2005 Pacific Systems Group. All Rights Reserved. While every effort has been made to ensure the accuracy of the material in this publication, Pacific Systems Group shall not be liable for any errors contained herein, or for incidental or consequential damages resulting from the performance, furnishing or use of this manual.

Pacific Systems Group
32533 Regents Boulevard
Union City, CA 94587
1-800-572-5517
www.pacsys.com

Chapter 1. About Spectrum Writer

What Is Spectrum Writer?

Spectrum Writer is a program that makes it *easy* to produce custom reports and files from your company's existing mainframe data.

With Spectrum Writer at your fingertips, both your end users and your boss will soon be amazed and delighted with your quick results. And you'll have the satisfaction of accomplishing more than ever before — with less effort!

Why You Need Spectrum Writer

Easy New Production Reports

The reports produced by Spectrum Writer look every bit as professional as those produced by individual report programs. Titles are perfectly centered. Column headings are neatly aligned above the data, and underlined. Totals are aligned under the numeric columns. This careful attention to detail means you can use Spectrum Writer to quickly produce your regular production reports. Its usefulness is not limited to ad hoc reports.

Fast One-Time Queries

Spectrum Writer is also great for those frequent "one-shot" requests. Now you'll be able to satisfy requests that there just wasn't time for without Spectrum Writer. You'll wonder how you ever got along without it.

Delight Your PC End-Users

When the users would really prefer to manipulate the mainframe data themselves, Spectrum Writer allows you to give it to them in PC format. The users can then process the mainframe data themselves in their spreadsheet, database or word processing program. And the programmers can get back to programming.

Create ASCII Files for Servers, Databases, Networks

Easily create comma-delimited or fixed-format ASCII files. Now your mainframe data can be used on all of the ASCII-based platforms at your shop.

Web Reports for your "Paperless Office"

Spectrum Writer can format your reports especially for viewing on Web browsers. You can put such reports on your company's Intranet or Internet site for easy company-wide (or public) viewing. Or, send the report to your colleagues as an e-mail attachment that they can automatically view from their e-mail reader. Spectrum Writer is a powerful tool in the move toward paperless "enterprise" reporting.

Perfect for Downsizing Applications

Use Spectrum Writer for one-time file conversions when downsizing mainframe applications to run on PC or client-server systems. Spectrum Writer converts the packed, binary, date, and bit fields to the kind of ASCII data needed on the new system.

Why You Need Spectrum Writer

Reduce Your CPU Usage

We hate to mention this, but some report writers are real "CPU Hogs." No wonder systems programmers tremble when programmers develop new applications with them. But, because Spectrum Writer is written entirely in efficient assembly language, its reports run amazingly fast. In many cases, there is no significant difference between Spectrum Writer's run time, and the run time of a COBOL program written to produce the same report. And when you consider the CPU cycles saved in development (fewer compiles, test runs, debugging, etc.), Spectrum Writer may actually lighten the load on your CPU.

Plus, Spectrum Writer can produce multiple reports (or output files) during a single pass of the input file. That can vastly reduce the total I/O, speeding things up even more.

Reduce PC Download Time and Hard Disk Usage

Spectrum Writer's PC files reduce download time and hard disk usage by letting you download only the data you actually need (not the entire mainframe file.) Why slow down your PC (and waste hard disk space) downloading records and fields that won't even be used?

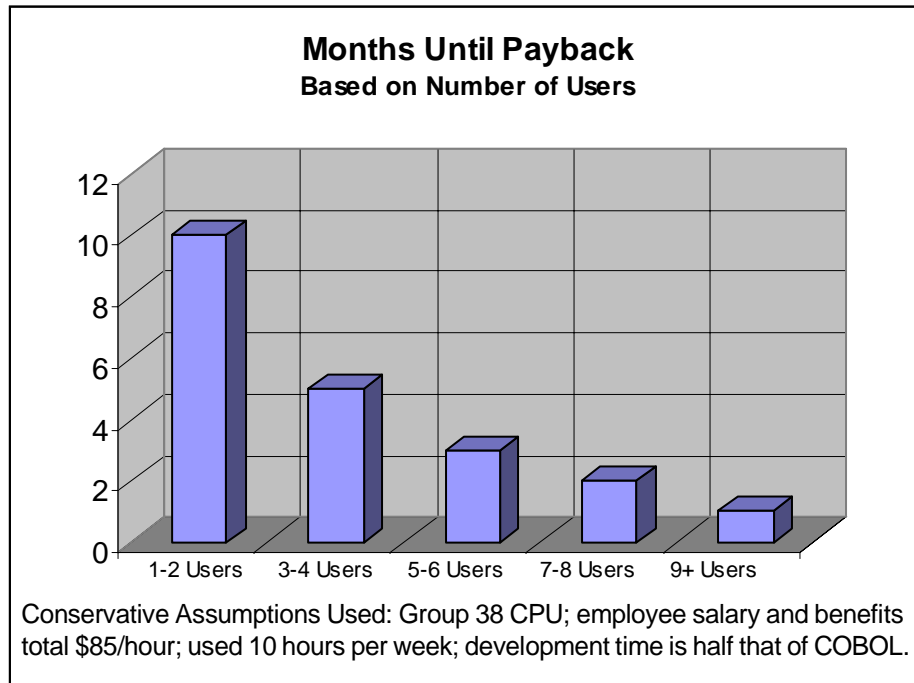
Spectrum Writer Pays for Itself Fast!

Spectrum Writer quickly pays its own way in a shop — maybe even with the first project you use it on!

Spectrum Writer greatly increases programmers' productivity. It can slash the programming effort required to create new reports by as much as 90%. That means more completed projects, in less time. And without an increase in staff. And if Spectrum Writer eliminates the need, even once, to bring in contract programmers to relieve overburdened staff, you'll recover its cost from that alone.

Spectrum Writer also increases the productivity of your PC users. If they are manually entering data now, the time savings from automating will be enormous. But even if you have an existing download application, Spectrum Writer reduces the "dead-time" associated with it. You'll eliminate the wasted time spent downloading unnecessary data. And you'll shift much of the slower sorting and number-crunching functions from the PC back up to the mainframe. And with Spectrum Writer, there are no expensive PC components to purchase, install and maintain. All you need is Spectrum Writer and your existing file transfer facility.

Add together the cumulative value of the hours saved by the programming staff and your end-users. You'll see that it won't take long to recoup your modest investment in Spectrum Writer.



Spectrum Writer Features

Spectrum Writer has the following main features:

- control statements use an easy, free format, English-like syntax that's easily learned by non-technical users
- allows long, user-friendly field names (unlike some report writers that restrict you to cryptic 8-byte names)
- easily combines data from flat files, VSAM files and DB2 tables
- use your existing COBOL or Assembler record layouts instead of creating a data dictionary. Or, use Spectrum Writer's simple data dictionary for added functionality.
- no data definition required for DB2 tables — Spectrum Writer accesses the definition from your DB2 system
- create multiple reports and output files from a single pass of the input file
- produces efficient internal machine code that is easy on your CPU
- formats output files into many standard PC formats, so that mainframe data can be easily imported into PC spreadsheet, database, word processing and presentation programs
- create comma-delimited ASCII files or fixed-format ASCII files
- produces output files for mainframe or Unix applications
- automatically produces HTML-formatted Web reports

Spectrum Writer Features

- report lines are not limited to 132 characters. Spectrum Writer can format a report as wide as your laser printer supports
- automatically prints bar graphs
- ability to print full-page forms
- ability to skip to a new sheet of paper at control breaks (not just the next "page")
- has a logical default for every aspect of the report, from the report titles, to how to format numeric and date fields, to the Grand Total line
- allows complete control over formatting of numeric fields, including handling of special cases like telephone numbers, social security numbers, etc.
- lets you format dates in any of over 40 different ways, including MM/DD/YY, DD/MM/YY, MM/DD/YYYY, etc. Or, with the month name spelled out, or abbreviated, and many more.
- has special numeric, date and time formatting options for international users
- allows complete control over report titles, column headings, and footnotes
- has a "forgiving" error philosophy which produces as much output as it reliably can, even when minor errors are encountered
- has thorough, clear documentation, including a User's Guide in non-technical language for end users
- validity-checks numeric data before processing it, so that no S0C7 abends occur
- ability to display file data in hexadecimal format, for analyzing invalid data
- converts fields from EBCDIC to ASCII and vice versa
- special features for speedy report development, such as limiting the number of records processed, or the number of report lines printed
- supports full "boolean logic" (the use of AND, OR and NOT) in conditional expressions
- ability to scan free format fields, to look for a certain text anywhere within the field
- comparisons and computations are allowed among *all* numeric fields (even if some are packed, some are binary, and others are character, etc.)
- comparisons are allowed among *all* date fields (even if some are Julian and some are Gregorian, some packed, others character, etc.)
- supports dates with 2–digit or 4–digit years
- supports century windowing for dates with 2–digit years
- supports every imaginable type of mainframe data, including over 30 kinds of date fields and over 20 kinds of time fields
- lets you create your own new fields
- full mathematical calculations are supported when creating new fields, including the use of many built-in functions

- supports a full range of functions to manipulate string data, including powerful parsing features
- a "compress" formatting feature lets you, for example, compress separate city, state and ZIP fields into a formatted address line
- lets you use data from existing mainframe reports (rather than mainframe files) in PC programs
- handles complicated record layouts, including variably-located fields, fields located by pointer or pointer expressions, etc.
- supports records that contain arrays with varying number of entries
- lets you specify your own spreadsheet column headings, or use defaults
- easily summarizes data
- automatically computes statistics (such as total, average, maximum, minimum)
- allows an unlimited number of input files for a single report or PC file
- allows an unlimited number of control breaks
- allows an unlimited number of print lines per input record
- allows complete customization of control breaks
- allows complete customization of Grand Totals at end of report
- built-in fields provide the system date, time, jobname, etc.
- can limit input file processing to a certain key range, to eliminate unnecessary I/O
- can halt input processing as soon as a user-defined condition is met, to eliminate unnecessary I/O
- has user exit interfaces for any special data handling required at the field level or record level
- has an I/O exit interface to allow access to files that use non-standard access methods
- prints end of job statistics, such as how many records read from each input file, and how many records included in report

Chapter 2. Report Writing Examples

To produce a new report without Spectrum Writer, a programmer has to write a new program. Even for relatively simple reports, the cycle of coding, testing and debugging can take days or even weeks. With Spectrum Writer, you no longer write detailed programming instructions to produce a new report. Just describe the desired report to Spectrum Writer with a few simple control statements.

Spectrum Writer quickly does all the hard work for you. It handles the I/O routines, error exits, selection tests, detail line formatting, date routines, page breaks and page heading routines, totalling, statistics, sorts, control breaks, etc. With Spectrum Writer your new report is ready right away.

How to Produce a Report in 5 Minutes

When you use Spectrum Writer to produce a report, you specify what you want — not how to produce it. That means you can produce new reports in just minutes.

Just describe the report you want with a few simple "control statements." Each statement tells Spectrum Writer about one aspect of the report that you want. You can produce a complete report with only two statements:

```
INPUT:  SALES-FILE
COLUMNS:  EMPL-NAME  EMPL-NUM  SALES-DATE  CUSTOMER  REGION  AMOUNT  TAX
```

The INPUT statement tells Spectrum Writer which of your company's files contains the data needed in your report. In the example above, we requested a report using data from a "Sales File."

The COLUMNS statement tells Spectrum Writer which fields from that file should appear in the report. Each field named in that statement will appear as one column of data in the report. In the example above, we requested report columns showing the employee name, employee number, sales date, customer's name, sales region, amount of the sale, and tax amount.

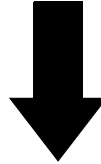
With just these two statements, we have given Spectrum Writer everything it needs to produce a report. You can see the report in [Figure 1](#).

You now see how easy it is to produce reports with Spectrum Writer. With just two simple statements we produced an attractive report that has:

- a default title containing the name of the input file, as well as the date, time, day of the week, and page number
- the columns of data that we requested, appearing in the order we specified
- neat, underlined column headings identifying each column of data
- the date and numeric fields attractively formatted
- a Grand Totals line with totals for each of the numeric columns
- an item count, showing the number of records included in the report

These Control Statements:

```
INPUT:   SALES-FILE
COLUMNS: EMPL-NAME EMPL-NUM SALES-DATE CUSTOMER REGION AMOUNT TAX
```



Produce this Report:

TUE 05/11/04	9:02 AM	DATA FROM SALES-FILE			PAGE	1
<u>EMPL</u>	<u>EMPL</u>	<u>SALES</u>				
<u>NAME</u>	<u>NUM</u>	<u>DATE</u>	<u>CUSTOMER</u>	<u>REGION</u>	<u>AMOUNT</u>	<u>TAX</u>
BAKER	044	03/26/04	JACKS CAFE	WEST	137.00	8.22
BAKER	044	04/12/04	JACKS CAFE	WEST	135.75	8.15
JOHNSON	037	03/12/04	ACE ELECTRICAL	SOUTH	101.38	6.09
JOHNSON	037	04/01/04	VILLA HOTEL	NORTH	234.45	14.07
JOHNSON	039	04/05/04	MARYS ANTIQUES	NORTH	9.98	0.60
JOHNSON	039	04/16/04	ACME BUILDING	SOUTH	500.00	30.00
JONES	036	04/15/04	EZ GROCERY	NORTH	10.25	0.62
JONES	036	04/15/04	TOY TOWN	NORTH	10.25	0.62
JONES	036	04/15/04	TOY TOWN	NORTH	121.76	7.31
MORRISON	042	03/29/04	STAR MARKET	EAST	44.35	2.66
MORRISON	042	03/30/04	A1 PHOTOGRAPHY	EAST	29.65	1.78
SIMPSON	041	04/01/04	EUROPEAN DELI	EAST	14.99	0.90
SIMPSON	041	04/30/04	J & S LUMBER	EAST	23.87	1.43
THOMAS	045	04/14/04	YOGURT CITY	WEST	9.98	0.60
*** GRAND TOTAL (14 ITEMS)					1,383.66	83.05

Remarks:

- this report was produced from just two statements: the INPUT and the COLUMNS statements
- the data used in this report comes from the SALES-FILE
- the seven columns of data in the report correspond to the field names in the COLUMNS statement
- the default column headings used are the field names themselves, broken apart at each dash
- the report has a default title which includes the name of the input file
- the report has a Grand Total line showing totals for the two numeric columns
- the number of items listed in the report is shown

Figure 1. A Spectrum Writer report produced with just two control statements

How Spectrum Writer Works

Spectrum Writer runs as a batch job under OS/390 or VSE. To produce a report, just type your control statements into a dataset. Then submit a simple batch job for execution. Spectrum Writer reads the control statements describing your report. It also automatically reads the statements that define your input file. (These can be a COBOL or Assembler record layout, or Spectrum Writer's own file definition statements.) Spectrum Writer then quickly produces the desired report.

Another Report Example

In this example, we'll add a few more control statements to illustrate additional Spectrum Writer features.

First, let's add a COMPUTE statement. COMPUTE statements let you compute your own new fields.

```
COMPUTE: TOTAL-DUE = AMOUNT + TAX
```

The above statement creates a new field named TOTAL-DUE. Its value is the sum of the AMOUNT and the TAX fields.

The COMPUTE statement is a very powerful feature of Spectrum Writer. Computed fields can be used in any way that other fields can be used: as data in the body of the report; in report titles; as sort fields; as control break fields; within conditional expressions; even as operands in other COMPUTE statements.

Let's also add a SORT statement to this example. The SORT statement tells Spectrum Writer what order you want the report lines to appear in.

```
SORT: REGION
```

The above statement specifies that the report should be sorted on the REGION field. You can also use the SORT statement to print subtotals in your report. For example:

```
SORT: REGION(TOTAL)
```

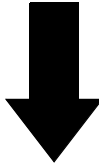
The above statement sorts the report by region and prints subtotals whenever the value of the REGION field changes.

Figure 2 shows a report that uses these new statements. (We also added a TITLE statement to specify the report title.)

These Control Statements:

```

INPUT: SALES-FILE
TITLE: 'SALES BY REGION, WITH REGION TOTALS'
COMPUTE: TOTAL-DUE = AMOUNT + TAX
COLUMNS: EMPL-NAME SALES-DATE CUSTOMER REGION AMOUNT TAX TOTAL-DUE
SORT: REGION(TOTAL)
    
```



Produce this Report:

SALES BY REGION, WITH REGION TOTALS						
EMPL NAME	SALES DATE	CUSTOMER	REGION	AMOUNT	TAX	TOTAL DUE
MORRISON	03/29/04	STAR MARKET	EAST	44.35	2.66	47.01
MORRISON	03/30/04	A1 PHOTOGRAPHY	EAST	29.65	1.78	31.43
SIMPSON	04/01/04	EUROPEAN DELI	EAST	14.99	0.90	15.89
SIMPSON	04/30/04	J & S LUMBER	EAST	23.87	1.43	25.30
*** TOTAL FOR EAST (4 ITEMS)				112.86	6.77	119.63
JOHNSON	04/01/04	VILLA HOTEL	NORTH	234.45	14.07	248.52
JOHNSON	04/05/04	MARYS ANTIQUES	NORTH	9.98	0.60	10.58
JONES	04/15/04	EZ GROCERY	NORTH	10.25	0.62	10.87
JONES	04/15/04	TOY TOWN	NORTH	10.25	0.62	10.87
JONES	04/15/04	TOY TOWN	NORTH	121.76	7.31	129.07
*** TOTAL FOR NORTH (5 ITEMS)				386.69	23.22	409.91
JOHNSON	03/12/04	ACE ELECTRICAL	SOUTH	101.38	6.09	107.47
JOHNSON	04/16/04	ACME BUILDING	SOUTH	500.00	30.00	530.00
*** TOTAL FOR SOUTH (2 ITEMS)				601.38	36.09	637.47
BAKER	03/26/04	JACKS CAFE	WEST	137.00	8.22	145.22
BAKER	04/12/04	JACKS CAFE	WEST	135.75	8.15	143.90
THOMAS	04/14/04	YOGURT CITY	WEST	9.98	0.60	10.58
*** TOTAL FOR WEST (3 ITEMS)				282.73	16.97	299.70
***** GRAND TOTAL (14 ITEMS)				1,383.66	83.05	1,466.71

Remarks:

- the report now includes a TOTAL-DUE column, which we created with a COMPUTE statement
- the TOTAL parm (in the SORT statement) makes REGION a control break field
- whenever the value in the REGION column changes, a control break occurs
- at each control break a total line prints, followed by two blank lines (as the default)

Figure 2. A sorted report with a title, computed fields and subtotals

Using Multiple Input Files

So far our reports have used data from a single input file, the one named in the INPUT statement. Now let's look at an example of using data from multiple files in a report. One of Spectrum Writer's most powerful features is its ability to easily read records from any number of additional files when producing a report.

Consider the first report example shown back on [page 7](#). That report uses only the SALES-FILE as input. It shows information about each sale made by an employee.

Now let's modify that report to also show each employee's department number and social security number. Our sample SALES-FILE does not contain that information. But our imaginary shop has another file: the employee file, which does contain this information about each employee. That file, named EMPL-FILE, is a keyed VSAM file containing one record for each employee. The key to that file is the employee number. Since our SALES-FILE also contains employee numbers, we have a way to link these two files. To use data from the EMPL-FILE, we simply add a READ statement like this:

```
READ:  EMPL-FILE  READKEY(EMPL-NUM)
```

The READ statement above tells Spectrum Writer to use the EMPL-NUM field from each record in the SALES-FILE as the key to read a record from the EMPL-FILE. Just by adding one READ statement we now have all of the fields from the EMPL-FILE available for use in our report. So, we can now add the DEPT-NUM and SOCIAL-SEC-NUM fields (from the EMPL-FILE) to the COLUMNS statement for our new report:

```
INPUT:  SALES-FILE
READ:   EMPL-FILE  READKEY(EMPL-NUM)
COLUMNS:  DEPT-NUM  EMPL-NAME  SOCIAL-SEC-NUM  SALES-DATE  CUSTOMER  AMOUNT  TAX
```

Figure 3 shows a report which uses the above statements. The report now has columns showing each employee's department number and social security number.

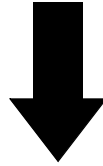
The fields from additional input files can be used in any way that fields from the primary input file are used. You can even use data from one READ file to read records from another file (to any level).

These Control Statements:

```

INPUT:    SALES-FILE
READ:     EMPL-FILE  READKEY(EMPL-NUM)
TITLE:    'LISTING OF RECENT SALES, BY DEPARTMENT'
SORT:     DEPT-NUM
COLUMNS: DEPT-NUM  EMPL-NAME  SOCIAL-SEC-NUM
          SALES-DATE  CUSTOMER  AMOUNT  TAX

```

**Produce this Report:**

LISTING OF RECENT SALES, BY DEPARTMENT						
DEPT NUM	EMPL NAME	SOCIAL SEC NUM	SALES DATE	CUSTOMER	AMOUNT	TAX
1	JOHNSON	999-04-0334	03/12/04	ACE ELECTRICAL	101.38	6.09
1	JOHNSON	999-04-0334	04/16/04	ACME BUILDING	500.00	30.00
2	JOHNSON	999-77-9981	04/01/04	VILLA HOTEL	234.45	14.07
2	JOHNSON	999-77-9981	04/05/04	MARYS ANTIQUES	9.98	0.60
2	JONES	999-09-8765	04/15/04	TOY TOWN	121.76	7.31
2	JONES	999-09-8765	04/15/04	EZ GROCERY	10.25	0.62
2	JONES	999-09-8765	04/15/04	TOY TOWN	10.25	0.62
3	MORRISON	999-12-0556	03/29/04	STAR MARKET	44.35	2.66
3	MORRISON	999-12-0556	03/30/04	A1 PHOTOGRAPHY	29.65	1.78
3	SIMPSON	999-05-0456	04/01/04	EUROPEAN DELI	14.99	0.90
3	SIMPSON	999-05-0456	04/30/04	J & S LUMBER	23.87	1.43
4	BAKER	999-19-0156	03/26/04	JACKS CAFE	137.00	8.22
4	BAKER	999-19-0156	04/12/04	JACKS CAFE	135.75	8.15
4	THOMAS	999-83-8221	04/14/04	YOGURT CITY	9.98	0.60
*** GRAND TOTAL (14 ITEMS)					1,383.66	83.05

Remarks:

- the READ statement makes all of the fields from the EMPL-FILE available for use in the report
- the COLUMNS statement uses the DEPT-NUM and SOCIAL-SEC-NUM fields from the EMPL-FILE
- we sorted the report on DEPT-NUM, a field from the second input file

Figure 3. A Spectrum Writer report with multiple input files

A DB2 Example

Spectrum Writer's DB2 Option lets you use DB2 data with Spectrum Writer exactly like any other mainframe data. That means you can:

- produce attractive custom reports from DB2 tables in just minutes.
- turn DB2 data into PC files designed especially for PC spreadsheet, database and graphics programs.
- turn DB2 data into any custom file format you need for use on Unix machines, database servers, other mainframe applications, etc.
- use DB2 data to create Web reports.

Spectrum Writer's DB2 Option has these features:

- no data dictionary is required when using DB2 data. You just use the standard DB2 names for your DB2 tables, views, and columns. This means you can start using Spectrum Writer with all of your DB2 tables right away.
- you can combine data from multiple DB2 tables to create your report or output file.
- you can also mix DB2 data with data from non-DB2 files. For example, you might have a tape file as the primary input to a Spectrum Writer job. Using data from that file, you could read additional data from VSAM files and/or DB2 tables. Or, you could use a DB2 table as your primary input and use data from it to read from additional DB2 tables or VSAM files. The possibilities are endless.

It's easy to use DB2 data with Spectrum Writer. You use the same control statements that you've already seen.

Figure 4 shows a report from one of the sample DB2 tables that IBM supplies with DB2.

Notice that we added an `OPTIONS` statement to tell Spectrum Writer which DB2 subsystem to access. Many shops have multiple DB2 subsystems (for example, a test subsystem and a production subsystem.) This option tells Spectrum Writer which subsystem to access for a particular run.

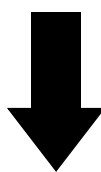
Of course, you can also use all of Spectrum Writer's other powerful features when working with DB2 data. For example, you can compute your own new fields, sort the report as desired, produce control breaks and subtotals, merge data from other inputs, and so on.

These Control Statements:

```

OPTION:  DB2SUBSYS('DB2T')
INPUT:   PROJECT
         DB2NAME('DSN8230.PROJ')
TITLE:   'LISTING OF PROJECT DB2 TABLE'
COLUMNS: PROJNO
          PROJNAME
          DEPTNO
          RESPEMP
          PRSTDATE
          PRSTAFF

```

**Produce this Report:**

LISTING OF PROJECT DB2 TABLE					
<u>PROJNO</u>	<u>PROJNAME</u>	<u>DEPTNO</u>	<u>RESPEMP</u>	<u>PRSTDATE</u>	<u>PRSTAFF</u>
AD3100	ADMIN SERVICES	D01	000010	01/01/82	6.50
AD3110	GENERAL AD SYSTEMS	D21	000070	01/01/82	6.00
AD3111	PAYROLL PROGRAMMING	D21	000230	01/01/82	2.00
AD3112	PERSONNEL PROGRAMMG	D21	000250	01/01/82	1.00
AD3113	ACCOUNT. PROGRAMMING	D21	000270	01/01/82	2.00
IF1000	QUERY SERVICES	C01	000030	01/01/82	2.00
IF2000	USER EDUCATION	C01	000030	01/01/82	1.00
MA2100	WELD LINE AUTOMATION	D01	000010	01/01/82	12.00
MA2110	W L PROGRAMMING	D11	000060	01/01/82	9.00
MA2111	W L PROGRAM DESIGN	D11	000220	01/01/82	2.00
MA2112	W L ROBOT DESIGN	D11	000150	01/01/82	3.00
MA2113	W L PROD CONT PROGS	D11	000160	02/15/82	3.00
OP1000	OPERATION SUPPORT	E01	000050	01/01/82	6.00
OP1010	OPERATION	E11	000090	01/01/82	5.00
OP2000	GEN SYSTEMS SERVICES	E01	000050	01/01/82	5.00
OP2010	SYSTEMS SUPPORT	E21	000100	01/01/82	4.00
OP2011	SCP SYSTEMS SUPPORT	E21	000320	01/01/82	1.00
OP2012	APPLICATIONS SUPPORT	E21	000330	01/01/82	1.00
OP2013	DB/DC SUPPORT	E21	000340	01/01/82	1.00
PL2100	WELD LINE PLANNING	B01	000020	01/01/82	1.00
*** GRAND TOTAL (20 ITEMS)					73.50

Figure 4. A Spectrum Writer DB2 report

Chapter 3. Creating ASCII Files

Spectrum Writer's easy 4GL language is also perfect for quickly producing custom output files. You can produce files for further use on the mainframe. Or for use on PCs or other ASCII-based platforms. For example, with just one command Spectrum Writer will automatically format your mainframe data as a comma delimited PC file. Such files can be downloaded to your PC and imported directly into virtually any spreadsheet, database, presentation, or word processor program.

Producing PC files with Spectrum Writer is easy — you simply add an `OPTIONS` statement that causes the "report" to be specially formatted as a PC file:

```
OPTIONS: PC
```

Why PC Formatting Is Necessary

The PC option tells Spectrum Writer to format your mainframe data so that PC programs can use it. Why is this special formatting necessary? Because most mainframe files contain fields that are formatted in ways that cannot be used by PC programs.

For example, the following types of mainframe data are not acceptable to most PC programs: packed or binary numeric fields; fields with implied decimal points; numeric fields with internal signs in the last digit (produced by many COBOL programs); date fields stored in packed, binary, or hexadecimal format; Julian date fields; and bit fields.

Naturally, as a mainframe report writer, Spectrum Writer *can* process these kinds of data. The PC option tells Spectrum Writer to reformat your mainframe data into the kind of character data that PC programs can process. Spectrum Writer also delimits your output file, putting quotation marks around character strings, and separating each field with a comma. Files in this standard format (often called "delimited ASCII" or "comma-delimited" files) can be imported into virtually all popular PC programs.

How to Create a PC File in 5 Minutes

To create a PC file, simply add an `OPTIONS` statement to your other statements.

Figure 5 illustrates this. The Lotus spreadsheet contains the mainframe data we requested, properly laid out into rows and columns. There are even column headings for each column. (Once imported into Lotus, we used its graphing facility to graph the AMOUNT and TAX columns.)

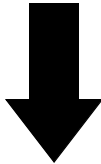
That's all there is to creating custom PC files with Spectrum Writer. With three simple statements we did all of the data selection and reformatting that would otherwise have taken an entire COBOL program to do.

Of course, you can also use all of Spectrum Writer's other powerful features when creating PC files. For example, you can compute your own new fields, sort your PC file, produce control breaks and subtotals, merge data from multiple input files, and so on.

These Control Statements:

```

OPTIONS: PC
INPUT: SALES-FILE
COLUMNS: REGION EMPL-NAME SALES-DATE SALES-TIME CUSTOMER AMOUNT TAX
    
```



Result in this Lotus 1-2-3 Spreadsheet:

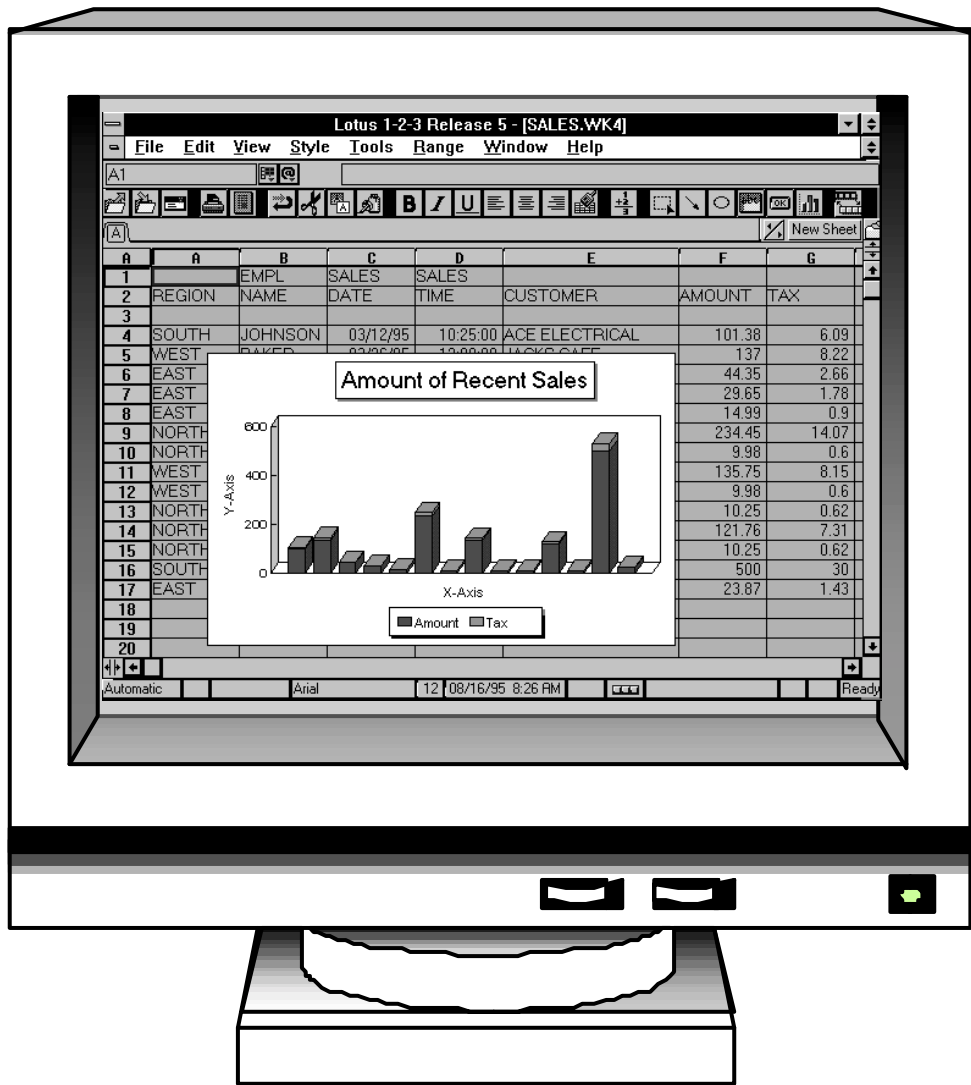


Figure 5. Using mainframe data in a Lotus 1-2-3 spreadsheet

Translating the PC File to ASCII

In the preceding example, the PC file that Spectrum Writer created was an EBCDIC file. That makes it easy to work with on the mainframe. (For example, you can browse it with ISPF to verify the contents and format.) So how was Lotus 1-2-3 able to use this EBCDIC file? The *file transfer program* translated it to ASCII during the download.

Tip: When downloading PC files, look for a "Translate ASCII" or similar option and make sure it is selected. Also, select the "CRLF" option. It adds ASCII carriage-return/line-feed bytes to the end of each record, which most PC programs expect.

This is a very convenient way to convert your EBCDIC mainframe data to ASCII. While on the mainframe, you can use mainframe tools to examine it. Then convert the file to ASCII as you transfer it to your PC. There you can use standard PC tools to work with it.

You may wonder why you couldn't just translate the whole, raw mainframe data file this same way. The answer is that you could do that, *as long as* the mainframe file doesn't contain any binary fields. (The binary fields would also get "translated" during the transfer, resulting in garbage appearing in those fields on your PC.) If the mainframe file has any binary fields (such as packed, binary integer or bit fields) then you need Spectrum Writer to first reformat the data into a PC file. All of the binary fields will be expanded into EBCDIC character fields. The resulting PC file will be pure EBCDIC — no binary data in it. Now it's safe to download it to your PC using the ASCII translation option.

Creating Native ASCII Files on the Mainframe

If you prefer, Spectrum Writer can also produce true ASCII files directly on the mainframe. This is useful if you want to build an output record that contains some ASCII character data along with some binary data. Such mixed records can't simply be translated as a whole.

Figure 6 shows an example of creating a native ASCII file with Spectrum Writer. In this example, we want to produce an output file containing the same data as in **Figure 5**. However, this time we want fixed-format records rather than a comma-delimited file. We want the character fields to be in ASCII. However, we want the AMOUNT and TAX fields to be 4-byte binary integer fields in the output file.

The MAINFRAME option in **Figure 6** tells Spectrum Writer that we are producing a mainframe-type file (not a comma-delimited PC file). This option sets the inter-column spacing to zero bytes. It also suppresses titles, column headings and totals.

On the COLUMNS statement, we specify the ASCII option for the fields that we want to be written in ASCII character format. For the SALES-DATE and SALES-TIME fields, we also specified the date and time formats that we wanted for the output file. All of these fields will now be written in ASCII rather than EBCDIC. The AMOUNT and TAX fields will be written as 4-byte binary integer fields.

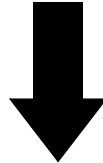
The lower box in **Figure 6** shows some of the resulting records (in hex format). That's all there is to writing ASCII files directly on your mainframe with Spectrum Writer.

Tip: When downloading ASCII files like this one to your PC, remember to perform a *binary* download. That is, turn off the ASCII translation option. However, you may still want to use the "CRLF" option (depending on how you will use the file on the PC). This option adds carriage-return/line-feed bytes to the end of each downloaded record.

These Control Statements:

```

OPTIONS: MAINFRAME
INPUT: SALES-FILE
COLUMNS: REGION(ASCII)
           EMPL-NAME(ASCII)
           SALES-DATE(ASCII MM-DD-YYYY)
           SALES-TIME(ASCII HH-MM-SS)
           AMOUNT(BINARY 4)
           TAX(BINARY 4)
    
```



Produce These Output Records (shown in hex dump format):

```

      . . . . 5 . . . 10 . . . 15 . . . 20 . . . 25 . . . 30 . . . 35 . . . 40 .
CHAR SOUTHJOHNSON  03/12/199510:25:00 ' s a
ZONE 545544445442223323323333333333333300290006
NUM  3F548AF8E3FE00003F12F199510A25A00007A0021
    
```

```

      . . . . 5 . . . 10 . . . 15 . . . 20 . . . 25 . . . 30 . . . 35 . . . 40 .
CHAR WEST BAKER   03/26/199512:09:09 5, 6
ZONE 545524444522223323323333333333333300380003
NUM  7534021B520000003F26F199512A09A0900540036
    
```

```

      . . . . 5 . . . 10 . . . 15 . . . 20 . . . 25 . . . 30 . . . 35 . . . 40 .
CHAR EAST MORRISON 03/29/199515:30:22 S
ZONE 445524455454422233233233333333333300150000
NUM  51340DF2293FE0003F29F199515A30A220013001A
    
```

```

      . . . . 5 . . . 10 . . . 15 . . . 20 . . . 25 . . . 30 . . . 35 . . . 40 .
CHAR EAST MORRISON 03/30/199519:05:41 • ²
ZONE 44552445545442223323323333333333330009000B
NUM  51340DF2293FE0003F30F199519A05A4100B50002
    
```

```

      . . . . 5 . . . 10 . . . 15 . . . 20 . . . 25 . . . 30 . . . 35 . . . 40 .
CHAR EAST SIMPSON  04/01/199508:17:57 Û Z
ZONE 4455254455442223323323333333333333000D0005
NUM  5134039D03FE00004F01F199508A17A57005B000A
    
```

```

      . . . . 5 . . . 10 . . . 15 . . . 20 . . . 25 . . . 30 . . . 35 . . . 40 .
CHAR NORTHJOHNSON 04/01/199517:02:47 [•
ZONE 445544444544222332332333333333333300590007
NUM  EF248AF8E3FE00004F01F199517A02A4700B5005F
    
```

(additional records not shown)

Figure 6. Creating a native ASCII output file

Chapter 4. Web Report Examples

Spectrum Writer can also format your reports especially for viewing on Web browsers. You can put such reports on your company's Intranet or Internet site for easy company-wide (or public) viewing. Or, send your report as an e-mail attachment to colleagues. They can automatically view the report right from their e-mail reader. Spectrum Writer is a powerful tool in the move toward paperless delivery of reports.

How to Create a Web Report in 5 Minutes

To change a regular Spectrum Writer report into a Web report, once again we simply add one statement:

```
OPTION: HTML
```

The above statement tells Spectrum Writer to add HTML formatting codes to your report so that it will display properly on a Web browser. You can then upload the report file to your Web site or attach it to an e-mail message. The report will be viewable on any PC with a Web browser.

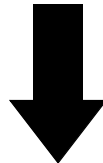
The HTML option also lets you specify a title for your Web page, if you like:

```
OPTION: HTML('ABC COMPANY SALES REPORT')
```

Figure 7 shows a Web page created using the above statement.

These Control Statements:

```
OPTION: HTML('ABC COMPANY SALES REPORT')
TITLE: 'SALES REPORT'
INPUT: SALES-FILE
COLUMNS: REGION EMPL-NAME SALES-DATE SALES-TIME CUSTOMER AMOUNT TAX
```



Result in this Web Report:

The screenshot shows a web browser window with the title 'ABC COMPANY SALES REPORT - Microsoft Internet Explorer'. The report content is as follows:

REGION	EMPL NAME	SALES DATE	SALES TIME	CUSTOMER	AMOUNT	TAX
SOUTH	JOHNSON	03/12/95	10:25:00	ACE ELECTRICAL	101.38	6.09
WEST	BAKER	03/26/95	12:09:09	JACKS CAFE	137.00	8.22
EAST	MORRISON	03/29/95	15:30:22	STAR MARKET	44.35	2.66
EAST	MORRISON	03/30/95	19:05:41	A1 PHOTOGRAPHY	29.65	1.78
EAST	SIMPSON	04/01/95	08:17:57	EUROPEAN DELI	14.99	0.90
NORTH	JOHNSON	04/01/95	17:02:47	VILLA HOTEL	234.45	14.07
NORTH	JOHNSON	04/05/95	14:33:10	MARYS ANTIQUES	9.98	0.60
WEST	BAKER	04/12/95	14:31:12	JACKS CAFE	135.75	8.15
WEST	THOMAS	04/14/95	15:41:38	YOGURT CITY	9.98	0.60
NORTH	JONES	04/15/95	07:58:32	EE GROCERY	10.25	0.62
NORTH	JONES	04/15/95	08:01:59	TOY TOWN	121.76	7.31
NORTH	JONES	04/15/95	13:52:41	TOY TOWN	10.25	0.62
SOUTH	JOHNSON	04/16/95	11:48:33	ACME BUILDING	500.00	30.00
EAST	SIMPSON	04/30/95	15:30:21	J & S LUMBER	23.87	1.43
*** GRAND TOTAL (14 ITEMS)					1,383.66	83.05

Figure 7. A basic Web report viewed with Internet Explorer

Writing your own HTML Tags

For users who know the HTML language, Spectrum Writer also lets you specify your own HTML tags directly within the Web report. By specifying your own HTML tags, you can create very impressive Web reports like the ones shown below and on the following page.

Writing your own HTML commands lets you take advantage of such powerful Web features as:

- Custom fonts, font sizes, and colors, as well as bold, italic and underlined text.
- Special effects like animation, blinking text or text that scrolls marquee-like across the screen.
- Logos, graphics, charts and photographs. For example, you can include employee photographs in a personnel directory.
- "Hot links" that help viewers navigate within your report — or which let them jump to external Web pages.
- Playing audio or video clips. For example, a viewer could click on a product number in an inventory report and automatically see a video clip demonstrating the product in use!

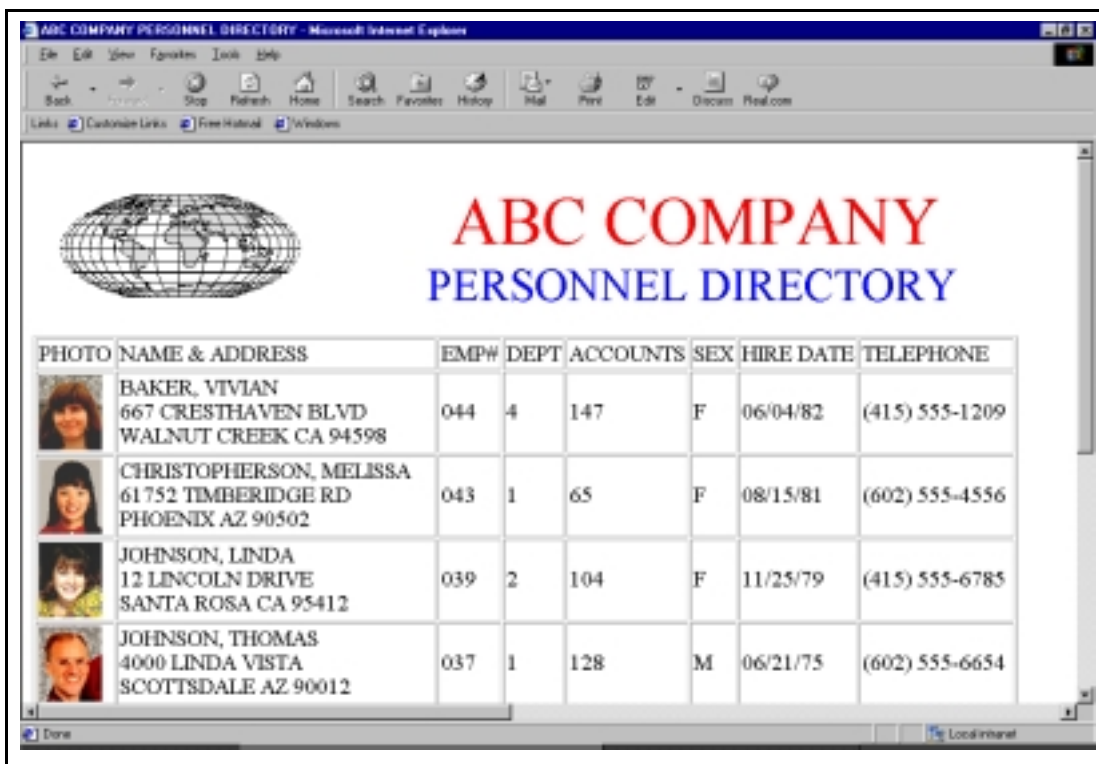


Figure 8. A Web report that uses graphics and tables

[CLICK HERE TO JUMP TO EAST REGION](#)
[CLICK HERE TO JUMP TO NORTH REGION](#)
[CLICK HERE TO JUMP TO SOUTH REGION](#)
[CLICK HERE TO JUMP TO WEST REGION](#)
[CLICK HERE TO JUMP TO GRAND TOTALS](#)

ABC COMPANY SALES BY REGION

REGION	EMPL NAME	SALES DATE	SALES TIME	CUSTOMER	AMOUNT	TAX
 <i>Eastern Region</i> ▼ ▼ ▼ ▼						
EAST	SIMPSON	04/30/95	15:30:21	J & S LUMBER	23.87	1.43
	SIMPSON	04/01/95	08:17:57	EUROPEAN DELI	14.99	0.90
	MORRISON	03/30/95	19:05:41	A1 PHOTOGRAPHY	29.65	1.78
	MORRISON	03/29/95	15:30:22	STAR MARKET	44.35	2.66
TOTALS FOR EAST REGION					112.86	6.77


SOUTH	JOHNSON	04/16/95	11:48:33	ACME BUILDING	500.00	30.00
	JOHNSON	03/12/95	10:25:00	ACE ELECTRICAL	101.38	6.09
TOTALS FOR SOUTH REGION					601.38	36.09
 <i>Western Region</i> ▼ ▼ ▼ ▼						
WEST	THOMAS	04/14/95	15:41:38	YOGURT CITY	9.98	0.60
	BAKER	04/12/95	14:31:12	JACKS CAFE	135.75	8.15
	BAKER	03/26/95	12:09:09	JACKS CAFE	137.00	8.22
TOTALS FOR WEST REGION					282.73	16.97
***** GRAND TOTAL (14 ITEMS)					1,383.66	83.05
CLICK HERE TO RETURN TO TOP OF REPORT						

Figure 9. A Web report using graphics at control breaks, and internal “hot links”

The Next Step

Now you've seen how easy it is to create custom reports and PC files with Spectrum Writer. The next step is to try it out with the files in your own shop, absolutely free for 30 days. Use the same easy language you've just read about with your own files and watch productivity soar! Amaze your end-users with your quick turnaround. Bask in your boss's praise for meeting "impossible" deadlines time after time.

You can download a free 30-day trial from our Web site. Spectrum Writer installs easily in under 30 minutes. Start producing custom reports and files today!



**Download Your
Free 30-Day Trial Now!**

www.pacsys.com