Welcome to the Output Delivery System

Before SAS 7, most SAS procedures generated output that was designed for a traditional line-printer. This type of output has limitations that prevent you from getting the most value from your results:

- Traditional SAS output is limited to monospace fonts. In a time of desktop document editors and publishing systems, you want more versatility in printed output.

- Some commonly used procedures produce printed output but do not create an output data set. Many times it would be very convenient to produce not only printed output but also an output data set that you could use as input to another SAS procedure or to a DATA step.

ODS is designed to overcome these limitations and make it easier for you to format your output. The SAS Output Delivery System (ODS) gives you greater flexibility in generating, storing, and reproducing SAS procedure and DATA step output along with a wide range of formatting options. ODS provides formatting functionality that is not available when using individual procedures or the DATA step without ODS.

Accessibility Features in ODS

The Output Delivery System conforms to the U.S. Section 508 guidelines for Web-based content. If you have specific questions about the accessibility of SAS products, send them to accessibility@sas.com or call SAS Technical Support.

The following additional accessibility items are available as programming options:

“Event Variables” on page 833

ABBR
specifies an abbreviation for the event variable.
ACRONYM
   specifies an acronym for an event variable.

ALT
   specifies an alternate description of an event variable.

CAPTION
   specifies the caption for a table.

LONGDESC
   specifies the long description of an event variable.

SUMMARY
   specifies a summary of a table.

Style Template:

  stylesheet.hightcontrast
   creates the same output as the default output except all of the colors are
   black on white.

“Header Attributes” on page 628

   abbr= on page 630
      specifies an abbreviation for the header.

   acronym= on page 630
      specifies an acronym for the header.

   alt= on page 630
      specifies an alternate description of the header.

   generic on page 632
      specifies whether multiple columns can use the header.

   longdesc= on page 632
      specifies the long description of the header.

“Table Attributes” on page 642

   longdesc= on page 648
      specifies a long description of a table.

   alt= on page 645
      specifies an alternate description of a table.

The following tagsets and ODS statements are 508 compliant:

“ODS PHTML Statement” on page 215
   opens, manages, or closes the PHTML destination, which produces simple
   HTML output that uses twelve style elements and no class attributes.

“ODS HTMLCSS Statement” on page 135
   opens, manages, or closes the HTMLCSS destination, which produces HTML
   output with cascading style sheets.

“ODS HTML Statement” on page 124
   opens, manages, or closes the HTML destination, which produces HTML 4.0
   output that contains embedded style sheets.

MSOFFICE2K on page 282 tagset
   produces HTML code for output generated by ODS for Microsoft Office
   products.
In SAS 9.1 and later releases, all of the accessibility enhancements have been merged into the ODS HTML tagsets. No additional steps are required.

A Quick Start to Using ODS

The Purpose of These Examples

The following examples are designed to help you to begin using ODS quickly. Use them to learn how to produce output that contains more interesting formatting. Then, to learn more about the depth, breadth, and true power of ODS, see “Introduction to the Output Delivery System” on page 16.

Creating Listing Output

Creating the listing output is simple—just run a DATA step or PROC step as usual. By default, the LISTING destination is on, and the DATA step and Base SAS procedures create listing output through ODS:

```sas
options source pagesize=60 linesize=80 nodate;

data employee_data;
  input IDNumber $ 1-4 LastName $ 9-19 FirstName $ 20-29 City $ 30-42 State $ 43-44 /
  Gender $ 1 JobCode $ 9-11 Salary 20-29 @30 Birth date9.
  @43 Hired date9. HomePhone $ 54-65;
  format birth hired date9.;

datalines;
  1919 Adams Gerald Stamford CT 07JUN75 0203/781-1255
  1653 Alexander Susan Bridgeport CT 12AUG78 0203/675-7715
  1400 Apple Troy New York NY 19OCT78 212/586-0808
  1350 Arthur Barbara New York NY 01AUG78 718/383-1549
  1401 Avery Jerry Paterson NJ 2071/322-8787
  1499 Barefoot Joseph Princeton NJ 021/812-5665
  1101 Bucom Walter New York NY 021/812-5665
  1333 Blair Justin Stamford CT 021/781-1777
  1402 Blalock Ralph New York NY 718/384-2849
  1479 Bostic Marie New York NY 718/384-8816
  1403 Bowden Earl Bridgeport CT 0203/781-1777
  28072 ME1 31JAN57 24DEC79 203/675-3434

```

Creating Listing Output 5
Listing output is the default format; therefore, when you request another format, your programs will create both listing output and output in the requested format. To prevent listing output from being created, use this statement:

```sql
ods listing close;
```
Creating Output in HTML Format

If you want to display output from a SAS program from the Web, you can use ODS to create output that is formatted in Hypertext Markup Language (HTML). To create HTML output, use the ODS HTML statement:

```sas
ods html file='external-file-for-HTML-output';
```

If you do not want to generate listing output in addition to the HTML output, then use this statement:

```sas
ods listing close;
```

The following program contains a PROC PRINT step that produces output in HTML, but does not produce the default listing output. You can browse this output with Internet Explorer, Netscape, or any other browser that fully supports HTML 3.2 or later.

```sas
ods listing close;
ods html file='external-file-for-HTML-output';
```

```sas
proc print data=employee_data(obs=12);
    id idnumber;
    title 'Personnel Data';
run;
```

```sas
ods html close;
ods listing;
```

Note the two ODS statements that follow the PROC PRINT step. To be able to browse your HTML files in a browser, you must execute the ODS HTML CLOSE statement. It is simply good practice to reset ODS to listing output, which is the default setting.

**Display 1.1  HTML 3.2 Output**

The following output is formatted in HTML 3.2 output and viewed in an Internet Explorer 5.0 browser.
Chapter 1

Producing Output in Multiple Formats at the Same Time

A simple way to produce output in multiple formats at one time is to produce the default listing output and then request an additional format, such as HTML, PDF, RTF, or PostScript.

```sas
ods html file='HTML-file-pathname.html';
ods pdf file='PDF-file-pathname.pdf';
ods rtf file='RTF-file-pathname.rtf';
ods ps file='PS-file-pathname.ps';

proc print data=employee_data(obs=12);
  id idnumber;
  title 'Personnel Data';
run;

ods _all_ close;
ods listing;
```

Note the two ODS statements that follow the PROC statement. The first one closes all files so that you can use them (for example, you could browse the HTML file or send the PDF file to a printer). The final statement opens the LISTING destination so that ODS returns to producing listing output for subsequent DATA or PROC steps in the current session.

Display 1.2  HTML 3.2 Output

The following output is formatted in HTML 3.2 output and viewed in an Internet Explorer 5.0 browser.
Display 1.3  PDF Output

The following output is formatted in PDF and viewed with Adobe Acrobat Reader.

![PDF Output](image)

Display 1.4  RTF Output

The following RTF output is viewed with Microsoft Word 2000.

![RTF Output](image)
Display 1.5  PostScript Output

The following PostScript output is viewed with Ghostview.

Output 1.2  Listing Output

This output is traditional SAS listing output.

Where to Go from Here

- **Examples of ODS output**: To see the types of output that you can create with ODS, see “Gallery of ODS Samples” on page 16.
- **Essential concepts in ODS**: For concepts that will help you to understand and to use ODS to your best advantage, see “Introduction to the Output Delivery System” on page 16.
- **Creating more complex HTML pages**: With ODS, you can create HTML pages that include a frame and a table of contents. For more information, see “ODS HTML
Statement” on page 124 and Appendix 2, “ODS and the HTML Destination,” on page 891. You can see many examples of HTML output in the *Base SAS Procedures Guide* online documentation.

- **ODS statements**: For reference information on the ODS statements, see Chapter 5, “Dictionary of ODS Language Statements,” on page 67. These statements control the many features of the Output Delivery System.

- **Using ODS with the DATA step**: With the addition of ODS-related options to the FILE and PUT statements, you can use ODS to produce enhanced DATA step reports. See Chapter 3, “Output Delivery System and the DATA Step,” on page 39.

- **Creating your own templates**: For even more control over formatting, you can create your own templates for formatting output. See Chapter 7, “TEMPLATE Procedure: Overview,” on page 395.