

## CHAPTER 1

# **Introduction to the Annotate Facility**

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## **1.1 Chapter Overview**

The Annotate facility allows the user to create customized modifications to the graphic output. These modifications can be either predetermined or data driven. This means that, through the use of Annotate, you can greatly extend the already powerful capabilities of SAS/GRAFH.

This chapter introduces the basic concepts associated with the Annotate facility and gives you some background into how we will use Annotate to communicate with the SAS/GRAFH procedures used to produce graphs and charts. If you already have an initial understanding of the concept of the Annotate data set, you may skip this chapter.

You may use Annotate with the following SAS/GRAFH procedures:

GANNO displays the output from Annotate data sets.

GCHART produces histograms and charts.

GCONTOUR creates contour plots.

GMAP uses coordinate data sets to produce maps.

GPLOT produces scatter plots.

GPRINT displays printed output.

GSLIDE creates panels that primarily contain textual information.

G3D creates three-dimensional plots.

Many users of SAS/GRAPH have avoided using Annotate because of what they perceive to be a rather steep and long learning curve. This is an unfortunate misconception. Using Annotate need not be difficult and can be easily introduced by presenting the different fundamentals of the specialized Annotate data set.

## **1.2 What Is the Annotate Facility?**

The Annotate facility is included within SAS/GRAPH and acts as a bridge between the procedure selected by the user and the user's desire to customize the graphics output.

The Annotate Facility can be used to

- position text or symbols anywhere on the graph
- control text color, font, and size
- draw line segments of any length or thickness
- draw polygons of any style, size, or shape
- otherwise enhance your graph.

The power of the Annotate facility is accessed through the use of a specialized data set. When using this data set Annotate looks for variables with specific names and attributes, and the values taken on by these variables let Annotate know what your intentions are.

## **1.3 Annotate Data Set**

The Annotate data set is an ordinary SAS data set. It in no way differs from any other SAS data set. Unlike most SAS data sets, however, the Annotate data set is more rigidly defined in terms of the variables that it is to contain and the attributes that these variables must have.

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Although the construction of Annotate data sets is often viewed as a daunting task for users who are unfamiliar with the way SAS/GRAPH assimilates the Annotate commands, the Annotate data set can actually be created in any of the ways that any SAS data set is created. Usually a DATA step is used with one of the following techniques:

- Small control data sets can be created using assignment statements.
- Flat files or raw data can be read into an Annotate data set.
- Existing SAS data sets can be restructured into Annotate data sets.

Although at first it seems clumsy to pass specific information to a procedure through the use of dedicated data sets, procedures are designed to accept, interpret, and respond to SAS data sets. Therefore, an Annotate data set can contain the functional information and procedure statements that could not be included in the PROC step itself. The result is a stronger and more flexible approach.

##### **More Information**

*SAS/GRAPH Software: Usage, Version 6, Chapter 54* provides a good overview of the Annotate data set as well as several important Annotate variables.

Version 7 and 8 users should consult *SAS OnlineDoc*.

### 1.3.1 Structure of the Annotate data set

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The SAS/GRAPH procedures sequentially read the observations from the Annotate data set and search for specific variables. The values taken on by these variables direct the Annotate facility to perform the desired actions.

Each observation requests that Annotate perform a particular function. The requested function causes Annotate to look for those variables that can be used to modify that particular function. Other variables that do not relate to that function for that Annotate observation are ignored.

### 1.3.2 Types of Annotate variables

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An Annotate data set can contain over 20 variables that have specific meanings. Fortunately, the new user need not master all of them prior to creating an annotated plot or graph. Basically, three questions need to be answered. What to do? How to do it? Where to do it?

The three primary Annotate variables, **FUNCTION**, **X**, and **Y**, are needed for most Annotate observations. **FUNCTION** tells Annotate *what to do*, and **X** and **Y** tell Annotate *where to do it*. Most of the other Annotate variables are used to enhance or supplement these three by providing information on *how to do it*.

### 1.3.3 Using variables to control tasks

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Because the Annotate data set is processed one observation at a time, the value of the variable **FUNCTION** is evaluated for each observation. The value that **FUNCTION** takes on determines which of the other variables in the observation may have information applicable to the **FUNCTION** and, therefore, to the observation being processed. The action specified by the **FUNCTION**, along with whatever modifiers are appropriate, takes place before the next observation is read.

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WHAT	WHERE	HOW
FUNCTION	X Y XSYS YSYS	POSITION SIZE STYLE LINE TEXT
LABEL	* * * *	* * * *
MOVE	* * * *	
DRAW	* * * *	* *

**Table 1.3.3** Selected Annotate variables and whether they are used when FUNCTION is equal to LABEL, MOVE, or DRAW

Table 1.3.3 shows several typical Annotate variables and whether they are used (indicated with an asterisk) with various values of the FUNCTION variable. Shown are three possible values of the variable FUNCTION ('LABEL', 'MOVE', and 'DRAW'). On an observation that has FUNCTION='DRAW', for instance, the variables SIZE and LINE will be used when defined. However, when an observation has FUNCTION='MOVE', the variables SIZE and LINE will be ignored.

Some of the supporting variables convey different information to Annotate depending on the value of the variable FUNCTION. When FUNCTION='LABEL', the variable SIZE refers to the height of the text to be printed, but when FUNCTION='DRAW', SIZE relates to the width of the line to be drawn.

The construction of the data set is fairly straightforward as long as you start with the definition of the FUNCTION for each observation in the Annotate data set. The selected FUNCTION determines what other variables will be needed. After you select the value of FUNCTION and appropriate support variables, the coordinates (X and Y) need to be supplied. These coordinates may be in the units of the plotted data or in units that define the graphics window itself. You will need to use the variables XSYS and YSYS to help set up the coordinate system for X and Y.

**See Also**

Section 2.4 provides more detailed information about the values taken on by XSYS and YSYS.

**More Information**

*SAS/GRAF Software: Usage, Version 6*, pp. 754–755 contains additional information on the coordinate systems and using XSYS and YSYS.

Version 7 and 8 users should consult *SAS OnlineDoc*.

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