

## CHAPTER

## 1

# Introducing the SAS/ACCESS Interface to PC File Formats

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## Overview of SAS/ACCESS Software

SAS/ACCESS software provides an interface between the SAS System and data from other software vendors' database management systems (DBMS), including PC file formats, such as DBF, DIF, WK1, WK3, WK4, and Excel 4 and 5. The SAS/ACCESS interface to PC file formats consists of two procedures and an interface view engine that perform these tasks:

- ACCESS procedure
  - creates SAS/ACCESS descriptor files that describe data in a PC file to the SAS System
  - creates a SAS data file from data that are stored in a PC file.
- interface view engine
  - enables you to use descriptor files in SAS programs to directly read data that are stored in PC files
  - enables you to specify descriptor files in SAS programs to update, insert, or delete data that are stored in some PC files.
- DBLOAD procedure
  - loads SAS data or other database-product data into PC files.
- DBF and DIF procedures
  - enable Windows, OS/2, and UNIX users to read and write to DBF and DIF files directly without using access and view descriptors. OS/390 users also have read and write access through the DBF procedure.
- Import/Export Facility and the IMPORT and EXPORT Procedures
  - enables you to transfer data between SAS and certain PC file formats that are not available through the ACCESS and DBLOAD procedures.

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## ACCESS Procedure: Creating and Using SAS/ACCESS Descriptor Files

SAS/ACCESS descriptor files are the tools that the SAS System uses to establish a connection to a PC file. To create descriptor files, use the ACCESS procedure. There are two kinds of descriptor files: access descriptors and view descriptors. The following sections give a brief overview of these files.

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### Access Descriptors

An *access descriptor* holds essential information about the structure of the PC file that you want to access. For example, you can access the file's format and name, its database field or column names, and its data types. Access descriptors can also contain the corresponding SAS System information such as the SAS variable names and formats. Typically, you have only one access descriptor for each PC file.

An access descriptor only describes a PC file's format and contents to the SAS System; that is, it is a master description file of the PC file for the SAS System. You cannot use an access descriptor in a SAS program. Rather, you use an access descriptor to create other SAS files, called view descriptors, that you use in SAS programs.

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### View Descriptors

A *view descriptor* defines some or all of the data that are described by one access descriptor (and, therefore, one PC file). For example, you may want to use only three of nine possible database columns and only some of the rows in a PC file. The view descriptor enables you to do this by selecting the database fields or columns that you want to use and specifying criteria to retrieve only the rows you want. Typically, you create several view descriptors based on one access descriptor, where each view descriptor selects a different subset of the PC file data.

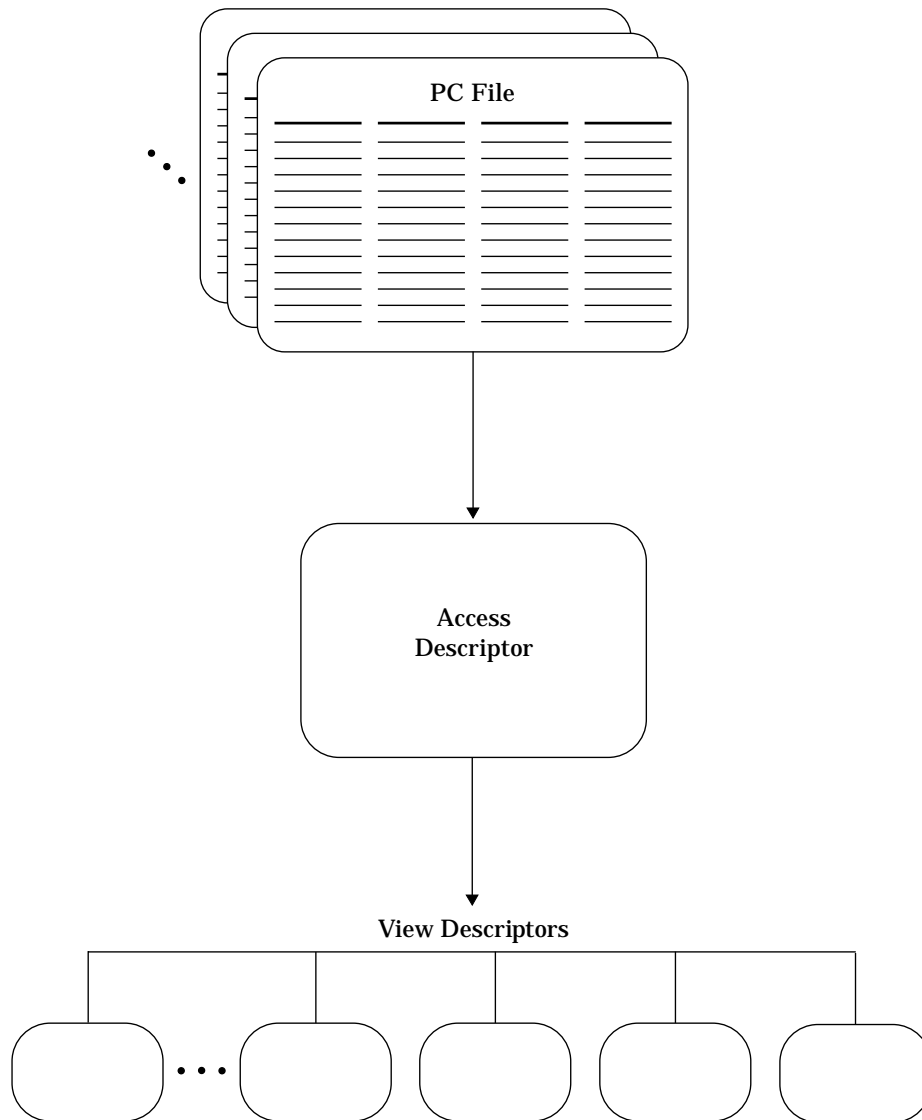
A view descriptor is a SAS data set or, more specifically, a SAS data view. You use a view descriptor in a SAS program much as you would any SAS data set. For example, you can specify a view descriptor in the DATA= statement of a SAS procedure or the SET statement of a DATA step. You can use a view descriptor in a SELECT statement of the SQL procedure to join, for example, the view descriptor's data with SAS data.

You can use a view descriptor to update data directly in some of the PC file formats, such as the DBF file format. For example, you can use a view descriptor to add records or mark records for deletion in a DBF file or to change the values in a DBF file field by using the FSEDIT or SQL procedures. You can also modify DBF file data by specifying a view descriptor in the MODIFY or REPLACE statements in a DATA step. See the "Essentials" section in the appropriate chapter for information on whether a PC file format allows updates.

In some cases, you may also want to create a SAS data file from data stored in a PC file. Using a view descriptor to copy PC file data into a SAS data file is called *extracting* the data. You can extract PC file data in a number of ways, for example, by specifying a view descriptor when using various methods within the ACCESS procedure. Or you could specify a view descriptor in a DATA step or in a SAS procedure's OUT= option. (See "PROC ACCESS Statement Options" on page 13 for information about extracting PC file data.) When you need to use the same PC file data in a number of SAS procedures or DATA steps, extracting the PC file data into a SAS data file might use fewer resources than directly accessing the data repeatedly.

Figure 1.1 on page 5 illustrates the relationships among a PC file, an access descriptor, and one or more view descriptors.

**Figure 1.1** Relationships among a PC File, an Access Descriptor, and View Descriptors




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## Interface View Engine: Reading and Sending Data Transparently

All SAS data sets, including view descriptors, use a SAS engine to retrieve data. Each SAS/ACCESS interface has its own *interface view engine*, which enables it to retrieve or send data between the SAS System and a PC file or database product. Whereas the interface view engine is an integral part of the SAS/ACCESS interface, the interface's design is transparent, so you seldom have to deal directly with the engine.

The name of your interface view engine is stored in SAS/ACCESS descriptor files when you create them. When you specify a view descriptor in a SAS program, the SAS System automatically interacts with the interface view engine to access the PC file data.

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## DBLOAD Procedure: Creating and Loading a PC File

The DBLOAD procedure enables you to create and load data into a new PC file. The data can be read from any SAS data file, DATA step view, PROC SQL view, or another view descriptor. The DBLOAD procedure gives you flexibility to retrieve and load data from any SAS data set or database product to which you have a SAS/ACCESS interface. See the "Essentials" section in the appropriate chapter for information on whether a PC file format allows you to load data.

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## DBF and DIF Procedures: Accessing DBF and DIF Files from PCs, UNIX, and OS/390

The DBF and DIF procedures give Windows, OS/2, OS/390, and UNIX users an alternative way of accessing DBF and DIF files. Instead of creating access descriptors and view descriptors, these users can convert these PC file types to SAS data sets, or vice versa. See Chapter 3, "DBF and DIF Procedures," on page 33 for more information.

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## Import/Export Facility and Procedures

The Import/Export Facility and the IMPORT and EXPORT procedures provide two ways in which to transfer data between SAS and external data sources. These external data sources can include PC file formats, database files, spreadsheets, and delimited files. The facility and procedures run under the Windows, OS/2, OpenVMS, and UNIX operating environments.

Whereas the Import/Export facility and procedures are part of base SAS software, a license to SAS/ACCESS software for PC File Formats is required in order to access certain PC formats. The facility and procedures also enable you to transfer data between SAS and certain files, such as Excel 97 and MS Access, that are not available through the ACCESS and DBLOAD procedures. See Chapter 5, "Import/Export Facility and Procedures," on page 51 for more information.

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## Sample Data in This Book

This book uses sample PC files that show you how to use the SAS/ACCESS interface to PC file formats. The PC files were created for a fictitious international textile manufacturer. This company's product line includes some special fabrics that are made to precise specifications. All the data in the files are fictitious.

*Note:* The files are designed to show how the SAS/ACCESS interface treats data stored in PC files. They are not meant as examples for you to follow in designing files for any purpose.  $\triangle$

Appendix 1, "Sample Data," on page 151 shows you the data in these sample PC files. The SAS/ACCESS software sample library contains the following files for your use. These files enable you to create the PC files and SAS/ACCESS descriptors and to run the examples.

**PCFFDBL.SAS**

contains the DATA steps and PROC DBLOAD statements to create the PC files.

**PCFFSAMP.SAS**

contains the SAS code of the examples in “Examples” on page 19.

**PCFFMACS.SAS**

contains macros that enable any SAS/ACCESS interface for a PC file format to create database-description statements; these statements are used in the PROC DBLOAD and the PROC ACCESS code in PCDBL.SAS and PCSAMP.SAS files.

**PCFFSCL.SAS**

contains the Screen Control Language (SCL) examples used in this book to create SAS/AF software examples.

These files are shipped with your SAS/ACCESS software. Check with your SAS system administrator or SAS Software Consultant for access to these files.



The correct bibliographic citation for this manual is as follows: SAS Institute Inc., *SAS/ACCESS<sup>®</sup> Software for PC File Formats: Reference, Version 8*, Cary, NC: SAS Institute Inc., 1999.

**SAS/ACCESS<sup>®</sup> Software for PC File Formats: Reference, Version 8**

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ISBN 1-58025-544-2

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SAS Institute Inc., SAS Campus Drive, Cary, North Carolina 27513.

1st printing, October 1999

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