

SAS/ETS[®] 14.3 User's Guide The SASECRSP Interface Engine

This document is an individual chapter from *SAS/ETS® 14.3 User's Guide*.

The correct bibliographic citation for this manual is as follows: SAS Institute Inc. 2017. *SAS/ETS® 14.3 User's Guide*. Cary, NC: SAS Institute Inc.

SAS/ETS® 14.3 User's Guide

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September 2017

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Chapter 47

The SASECRSP Interface Engine

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Overview: SASECRSP Interface Engine

Introduction

The SASECRSP interface engine in SAS/ETS software enables SAS users to access and process time series, events, portfolios, and group data that reside in Center for Research in Security Prices databases (CRSPAccess data). It also provides a seamless interface between CRSP and SAS data processing. Currently, the SASECRSP engine supports access of CRSP US Stock Databases and CRSP Indices Databases.

Opening a Database

The SASECRSP interface engine uses the LIBNAME statement to enable you to specify which CRSPAccess database you want to access and how you want to select time series or events from that database.

To specify the database, you supply the combination of a physical path to indicate the location of the CRSPAccess data files and a set identifier (SETID) to identify the selected database from those available at the physical path. Specify one SETID from [Table 47.1](#). Notice that the CRSP environment variable CRSPDB_SASCAL must be defined before the SASECRSP engine can access the CRSPAccess database calendars that provide the time ID variables and enable the libref to be assigned successfully. If your database SETID is 250, use the SASEXCCM interface to access your data. For more information about the SASEXCCM interface engine, see Chapter 55, “[The SASEXCCM Interface Engine](#).” Because CRSP no longer supports the CPZ data format, the SASECRSP engine no longer supports the SETID 200 (CRSP/Compustat Merged, CCM) data access.

Table 47.1 CRSPAccess Databases SETIDs

SETID	Data Set
10	CRSP Stock, daily data
20	CRSP Stock, monthly data
400	CRSP Indices data, monthly index groups
420	CRSP Indices data, monthly index series
440	CRSP Indices data, daily index groups
460	CRSP Indices data, daily index series

Usually you do not want to open the entire CRSPAccess database, so for efficiency and ease of use, the SASECRSP engine supports a variety of options for performing data selection on your CRSPAccess database by using the LIBNAME statement. These options enable you to open and retrieve data for only the portion of the database that you want. The availability of some of these options depends on the type of database that you open.

CRSP US Stock Databases

When accessing the CRSP US Stock Databases, you can select which securities to access by specifying their PERMNOs with the PERMNO= option. A PERMNO is CRSP's unique permanent issue identification number and the primary key for its stock databases. Alternatively, a number of secondary keys can be used to select stock data. For example, you can use the PERMCO= option to read selected securities based on CRSP's unique permanent company identification number, PERMCO. A full list of possible keys for accessing CRSP Stock data is shown in [Table 47.2](#).

Table 47.2 Keys for Accessing CRSP Stock Data

Key	Access By
PERMNO	CRSP's unique permanent issue identification number. This is the primary key for CRSP Stock Databases.
PERMCO	CRSP's unique permanent company identification number
CUSIP	CUSIP number
HCUSIP	Historical CUSIP
SICCD	Standard industrial classification (SIC) code
TICKER	Ticker symbol (for active companies only)

CRSP/Compustat Merged Databases—No Longer Supported by the SASECRSP Engine

Use the SASEXCCM interface engine instead of the SASECRSP interface engine to access your Xpressfeed CCM data. The SASEXCCM interface engine provides data item handling access methods by using CRSPAccess version 3.23. For a detailed description of this new SAS/ETS interface engine, see Chapter 55, “The SASEXCCM Interface Engine.”

Because CRSPAccess version 3.23 does not support CPZ data (legacy Compustat data format for SETID 200), the SASECRSP engine issues the following error messages when you specify the SETID=200 option and/or the CRSPLINKPATH= option:

```
ERROR: Use the SASEXCCM engine instead of the SASECRSP engine for CCM access.
The CPZ data format needed for SETID=200 and the CRSPLINKPATH= options
was last shipped in July 2011 and is no longer supported by CRSP.
Use of the SASECRSP engine for this purpose is not allowed:
Depreciated calendar configurations can result in fatal errors,
corrupted memory, tracebacks, exceptions, or incorrect results
for all libref assignments that follow the deassignment
of a CCM/CRSPLINKPATH libref.
ERROR: Engine is unable to open crspdb CPZ200606
with SETID 200. Check that your CRSP database contains the
crsp_ca_ref_2.bin file.
```

CRSP Indices Databases

When accessing the CRSP Indices Databases, you can select which indices to access by specifying their INDNOs. INDNO is the primary key for the CRSP Indices Databases. You can specify which INDNO to use by specifying the INDNO= option. No secondary key access is supported for CRSP Indices. A full list of possible keys for accessing CRSP Indices data is shown in [Table 47.3](#).

Table 47.3 Keys for Accessing CRSP Indices Data

Key	Access By
INDNO	CRSP's unique permanent index identifier number. This is the primary key for CRSP Indices Databases. It enables you to specify which index series or groups you want to select.

Regardless of which database you access, you can always use the INSET= and RANGE= options for subsetting and selection. The RANGE= option subsets the data by date. The INSET= option enables you to specify which issues or companies to select from the CRSP Indices data by using an input SAS data set.

Using Your Opened Database

After the libref is assigned, the database is opened. You can retrieve data for any member that you want in the opened database. For a complete description of available data sets and their fields, see the section “[Data Elements Reference: SASECRSP Interface Engine](#)” on page 3429. You can also use the SAS DATA step to perform further subsetting and to store the resulting time series in a SAS data set. Because CRSP and SAS use three different date representations, you can use the CRSP date formats, informats, and functions that the SASECRSP engine provides for your data processing needs. For more information about dates in the SASECRSP engine, see the section “[Understanding CRSP Date Formats, Informats, and Functions](#)” on page 3425 and [Example 47.6](#) later in this chapter.

The SASECRSP engine supports Linux X64 (64-bit), Solaris Sun Ultra Sparc, Solaris on Intel x86, and Windows. Windows no longer requires you to install the CRSPAccess API, because it is now distributed automatically by your SAS/ETS installation. Prior to running SASECRSP, your Windows setup requires that the environment variable, CRSPDB_SASCAL, be set to the path where your database calendar files reside.

Getting Started: SASECRSP Interface Engine

Structure of a SAS Data Set That Contains Time Series Data

SAS requires time series data to be in a specific form that is recognizable by the SAS System. This form is a two-dimensional array, called a SAS data set, whose columns correspond to series variables and whose rows correspond to measurements of these variables at certain points in time. The time at which observations are recorded can be included in the data set as a time ID variable. Because CRSP sets the date at the end of a time period instead of at the beginning, the SASECRSP interface engine follows this convention. For example, the time ID variable for any particular month in a monthly time series is set to the last trading day of that month.

The SASECRSP engine provides several different time ID variables, depending on the data member that is opened. For most members, a time ID variable named CALDT is provided. CALDT provides a day-based calendar date and is in a CRSP date format. The dates are stored as an offset in an array of trading days or a trading-day calendar. Five different CRSP trading-day calendars are available; which calendar is used

depends on the frequency of the data member. For example, the CRSP date for a daily time series refers to a daily trading-day calendar.

The five trading-day calendar frequencies are annual, quarterly, monthly, weekly, and daily. For convenience, the format and informat for the frequency field are set so that the CRSP date is automatically converted to an integer date representation when viewed or printed. For data programming, the SASECRSP engine provides 23 different user functions for date conversions between CRSP, SAS, and integer dates.

Reading CRSP Data Files

The SASECRSP engine supports reading time series, events, portfolios, and group data from CRSPAccess databases. The SETID that you specify determines the database that is read. For a list of possible databases, see [Table 47.1](#). The CRSP environment variable CRSPDB_SASCAL must be defined before the SASECRSP engine can access the CRSPAccess database calendars that provide the time ID variables and enable the libref to be successfully assigned.

Using the SAS DATA Step

You can store the selected series in a SAS data set by using the SAS DATA step. You can also perform other operations on your data inside the DATA step. After the data are stored in a SAS data set, you can use them as you would use data in any other SAS data set.

Using SAS Procedures

You can print the output SAS data set by using the PRINT procedure, and you can report information about the contents of your data set by using the CONTENTS procedure.

You can also create a view of the CRSPAccess database by using the SQL procedure in conjunction with a SASECRSP libref.

Using the SAS Windowing Environment

You can see the available data sets in the SAS LIBNAME window of the SAS windowing environment. To do so, select the SASECRSP engine libref in the LIBNAME window that you have previously defined in your LIBNAME statement. You can view your SAS output observations by double-clicking the desired output data set libref in the LIBNAME window of the SAS windowing environment. Type **Viewtable** on the SAS command line to view any of your SASECRSP engine tables, views, or librefs for both input and output data sets.

Before you use the **Viewtable** command, it is recommended that you store your output data sets in a physical folder or library that is separate from the folder or library used for your input databases. (The default location for output data sets is the SAS Work library.)

Using CRSP Date Formats, Informats, and Functions

Historically, CRSP has used two different methods to represent dates, and SAS has used a third. The SASECRSP engine provides 23 functions, 15 informats, and 10 formats to enable you to easily translate the dates from one internal representation to another. For more information, see the section “Understanding CRSP Date Formats, Informats, and Functions” on page 3425.

Syntax: SASECRSP Interface Engine

The SASECRSP engine uses standard engine syntax. The options that the SASECRSP engine uses are summarized in Table 47.4.

Table 47.4 Summary of SASECRSP Engine Options

Option	Description
SETID=	Specifies which CRSP database subset to open. This option is required. See Table 47.1 for a complete list of supported SETIDs
PERMNO=	Specifies a CRSP PERMNO to be selected for access
PERMCO=	Specifies a CRSP PERMCO to be selected for access
CUSIP=	Specifies a current CUSIP to be selected for access
HCUSIP=	Specifies a historic CUSIP to be selected for access
TICKER=	Specifies a ticker to be selected for access (for active companies only)
SICCD=	Specifies a SIC code to be selected for access
INDNO=	Specifies a CRSP INDNO to be selected for access
RANGE=	Specifies the range of data to keep in format 'YYYYMMDD-YYYYMMDD'
INSET=	Uses a SAS data set named Setname as input for issues

The LIBNAME libref SASECRSP Statement

LIBNAME libref SASECRSP 'physical name' options ;

The physical name that the LIBNAME statement requires should point to the directory of CRSPAccess data files where the CRSP database that you want to open is located. Note that the physical name *must* end in a slash for UNIX environments and a backslash for Windows environments.

The CRSP environment variable CRSPDB_SASCAL must be defined before the SASECRSP engine can access the CRSPAccess database calendars. The CRSP environment variable CRSPDB_SASCAL is necessary for the SASECRSP libref to be assigned successfully. This environment variable should be defined automatically either by the CRSP software installation or, in later versions, by the CRSP data installation. Because occasionally the variable is not set properly, always check to ensure that the CRSPDB_SASCAL

environment variable is set to the location where your most recent CRSP data reside. Remember to include the final slash or backslash as required.

After the libref is assigned, you can access any of the available data sets or members within the opened database. For a complete description of available data sets and their fields, see the section “[Data Elements Reference: SASECRSP Interface Engine](#)” on page 3429.

You can specify the following options.

SETID=*crsp_setidnumber*

specifies the CRSP database that you want to read from. SETID= is a required option. Choose one SETID from the six possible values in [Table 47.1](#). The SETID limits the frequency selection of time series that are included in the SAS data set.

For example, to access monthly CRSP US Stock data, you would use the following statements:

```
LIBNAME myLib sasecrsp 'physical-name'
      SETID=20;
```

PERMNO=*crsp_permnumber*

enables you to select data from your CRSP database by the PERMNO (or other keys) that you specify. A PERMNO is CRSP’s unique permanent issue identification number. There is no limit to the number of *crsp_permnumber* options that you can use. By default, the SASECRSP engine reads all keys for the CRSPAccess database that you specified in your SASECRSP libref.

From a performance standpoint, the PERMNO= option enables efficient random access and reads *only* the data for the PERMNOs specified.

For example, the following LIBNAME statement reads data only for Microsoft Corporation (PERMNO=10107) and International Business Machines Corporation (PERMNO=12490) by using the primary PERMNO key and thus is very efficient:

```
LIBNAME myLib sasecrsp 'physical-name'
      SETID=20
      PERMNO=10107
      PERMNO=12490;
```

The PERMCO=, CUSIP=, HCUSIP=, SICCD=, TICKER=, and INDNO= options behave similarly, and you can use them in conjunction with or in place of the PERMNO= option. For example, you could use the following statement to access monthly data for Microsoft and IBM:

```
LIBNAME myLib sasecrsp 'physical-name'
      SETID=20
      TICKER='MSFT'
      CUSIP=59491810;
```

Details about the use of the other key selection options (PERMCO, CUSIP, HCUSIP, TICKER, SICCD, and INDNO) follow.

PERMNOs that you specify by using this option can select the companies or issues to keep for CRSP US Stock data, but PERMNO is not a supported option for CRSP Indices data. Use the INDNO=

option with the CRSP Indices data and use the PERMNO= option with the CRSP US Stock data. Details about the use of key selection options for each type of database follow.

STK Databases

PERMNO is the primary key for CRSP Stock data. Every valid PERMNO that you specify with the PERMNO= option keeps exactly one issue.

IND Databases

INDNO is the primary key for accessing CRSP Indices data. PERMNO is not available as a key for the IND (CRSP Indices) Databases; use INDNO for efficient access of the IND Databases.

PERMCO=*crsp_permcompany*

is similar to the PERMNO= option in that it enables you to use the CRSP's unique permanent company identification key (PERMCO) to select the companies or issues to keep. There is no limit to the number of *crsp_permcompany* options that you can use.

STK Databases

PERMCO is a secondary key for accessing CRSP US Stock data. One PERMCO can map to multiple PERMNOs. Access by a PERMCO key is equivalent to access by all mapped PERMNOs.

IND Databases

Use INDNO for accessing CRSP Indices data. PERMCO is not available as a key for accessing CRSP Indices data; use INDNO instead.

CUSIP=*crsp_cusip*

is similar to the PERMNO= option in that it enables you to use the CUSIP key to select the companies or issues to keep. There is no limit to the number of *crsp_cusip* options that you can use.

STK Databases

CUSIP is a secondary key for accessing CRSP US Stock data. One CUSIP maps to one PERMNO.

IND Databases

Use INDNO for accessing CRSP Indices data. CUSIP is not available as a key for accessing CRSP Indices Databases; use INDNO instead.

HCUSIP=*crsp_hcusip*

is similar to the PERMNO= option in that it enables you to use the historical CUSIP key, HCUSIP, to select the companies or issues to keep. There is no limit to the number of *crsp_hcusip* options that you can use.

STK Databases

HCUSIP is a secondary key for accessing CRSP US Stock Databases. One HCUSIP maps to one PERMNO.

IND Databases

Use INDNO for accessing CRSP Indices Databases. HCUSIP is not available as a key for accessing CRSP Indices Databases; use INDNO instead.

TICKER=*crsp_ticker*

is similar to the PERMNO= option in that it enables you to use the TICKER key to select the companies or issues to keep. There is no limit to the number of *crsp_ticker* options that you can use.

STK Databases

TICKER is a secondary key for accessing CRSP US Stock Databases. One TICKER maps to one PERMNO. **NOTE:** Some PERMNOs are inaccessible by the TICKER key.

IND Databases

Use INDNO for accessing CRSP Indices Databases. TICKER is not available as a key for accessing CRSP Indices Databases; use INDNO instead.

SICCD=*crsp_siccd*

is similar to the `PERMNO=` option in that it enables you to use the Standard Industrial Classification (SIC) code (SICCD) to select the companies or issues to keep. There is no limit to the number of `crsp_siccd` options that you can use.

STK Databases

SICCD is a secondary key for accessing CRSP US Stock Databases. One SICCD can map to multiple PERMNOs. All PERMNOs that have been classified once under the specified SICCD are mapped and the data for them are retrieved. Access by the SICCD key is equivalent to access by all PERMNOs that have ever been classified under the specified SICCD key.

IND Databases

Use INDNO for accessing CRSP Indices Databases. SICCD is not available as a key for accessing CRSP Indices Databases; use INDNO instead.

INDNO=*crsp_indno*

is similar to the PERMNO= option in that it enables you to use CRSP's permanent index number INDNO to select the companies or issues to keep. There is no limit to the number of *crsp_indno* options that you can use.

STK Databases

INDNO is not available as a key for accessing CRSP US Stock Databases, but it can be used in the combined CRSP US Stock and Indices Databases.

IND Databases

INDNO is the primary key for accessing CRSP Indices Databases. Every INDNO that you specify keeps exactly one index series or group.

For example, you can use the following statement to access the CRSP NYSE Value-Weighted and Equal-Weighted daily market indices:

```
LIBNAME myLib3 sasocrsp 'physical-name'
SETID=460
INDNO=1000000 /* Value-Weighted */
INDNO=1000001; /* Equal-Weighted */
```

RANGE='crsp_begdt-crsp_enddt'

limits the time range of data that are read from your CRSPAccess database. Specify this option in your LIBNAME *libref* SASECRSP statement, where *crsp_begdt* is the beginning date of the range in 'YYYYMMDD' format and *crsp_enddt* is the ending date of the range in 'YYYYMMDD' format.

For example, to access monthly stock data for Microsoft Corporation and for International Business Machines Corporation for the first quarter of 1999, you can use the following statement:

```
LIBNAME myLib sasecrsp 'physical-name'
      SETID=20
      PERMNO=10107
      PERMNO=12490
      RANGE='19990101-19990331';
```

The specified beginning and ending dates are interpreted as calendar dates.

You can use the RANGE= option for all members of CRSP US Stock and Indices Databases. CRSP data members are associated with only one date, and all CRSP data members have a date resolution to the day. For example, monthly time series, although they are monthly, resolve to the last trading day of the month.

INSET='setname[,keyfieldname,keyfieldtype,date1field,date2field]'

specifies a SAS data set named *setname* as input for issues. The SASECRSP engine assumes that a default PERMNO field that contains selected CRSP PERMNOs is present in the data set. If optional parameters are used, they must all be specified. The only acceptable shorthand for dropping the parameters is to drop those at the very end, assuming they are all being omitted. Dropped parameters use their defaults.

You can specify the following parameters:

<i>keyfieldname</i>	labels the field that contains the keys to be selected. If unspecified, the default is PERMNO.
<i>keyfieldtype</i>	specifies the CRSPAccess key type of the provided keys. Possible key types are: PERMNO, PERMCO, CUSIP, HCUSIP, TICKER, SICCD, or INDNO. If unspecified, the default is "PERMNO".
<i>date1field</i>	specifies the beginning date of the specific date range restriction being applied to this key. If either <i>date1field</i> or <i>date2field</i> is omitted, then by default there is no date range restriction.
<i>date2field</i>	specifies the ending date of the specific date range restriction being applied to this key. If either <i>date1field</i> or <i>date2field</i> is omitted, then by default there is no date range restriction.

Individual date range restrictions that you specify by using the INSET= option can be used in combination with the RANGE= option in the LIBNAME statement. In such a case, only data from the intersection of the individual date restriction and the global RANGE= option date restriction are read.

Details: SASECRSP Interface Engine

Using the INSET= Option

The following examples illustrate the use of the INSET= option.

Basic INSET= Option Use: Providing a List of PERMNOs

This example uses the INSET= option to extract monthly data for a portfolio of three companies. No date range restriction is used.

```
data testin1;
    permno = 10107; output;
    permno = 12490; output;
    permno = 14322; output;
run;

LIBNAME mstk sasecrsp 'physical-name'
              SETID=20
              INSET='testin1';

proc print data=mstk.stkhead (keep=permno permco begdt enddt hcomnam htick);
run;
```

General Use of the INSET= Option to Specify Lists of Keys

This example illustrates the use of the INSET= option to select a few index series from the CRSP Indices data, and securities from the CRSP US Stock data. The libref **ind2** is used for accessing the CRSP Indices data by using the two specified INDNO keys. The libref **sec3** is used to access the CRSP US Stock data by using the three specified TICKER keys. Note the use of shorthand in specifying the INSET= option. The *date1field*, *date2field*, and *datatype* arguments are all omitted, so the default of no range restriction applies (though the range restriction set by the RANGE= option in the LIBNAME statement still applies). For more information, including sample output, see [Example 47.4](#).

```
data indices;
    indno=1000000; output; /* NYSE Value-Weighted Market Index */
    indno=1000001; output; /* NYSE Equal-Weighted Market Index */
run;

libname ind2 sasecrsp "%sysget(CRSP_MSTK)" setid=420
              inset='indices,INDNO,INDNO' range='1990101-19990401';

title2 'Total Returns for NYSE Value- and Equal-Weighted Market Indices';
proc print data=ind2.tret label;
run;

data securities;
    ticker='BAC'; output; /* Bank of America */
```

```

        ticker='DUK'; output; /* Duke Energy */
        ticker='GSK'; output; /* GlaxoSmithKline */
run;

libname sec3 sasecrsp "%sysget(CRSP_MSTK)" setid=20
              inset='securities,TICKER,TICKER'
              range='19970820-19970920';

title2 'PERMNOs and General Header Info of Selected TICKERs';
proc print data=sec3.stkhead (keep=permno htick htssymbol) label;
run;

title3 'Average Price for Bank of America, Duke and GlaxoSmithKline';
proc print data=sec3.prc label; run;

```

Key-Specific Date Range Restriction with the INSET= Option

Suppose you not only want to select keys with your INSET= option, but you also want to specify a date range restriction for each key individually. The following statements show how to do this. Again, shorthand enables you to omit the *date1field* and *date2field* arguments. The dates that are provided default to a calendar interpretation. For more information, including the sample output, see [Example 47.5](#).

```

title2 'INSET=testin2 uses date ranges along with PERMNOs';
title3 '10107, 12490, 14322, 25788';
title4 'Begin dates and end dates for each permno are used in the INSET';

data testin2;
    permno = 10107; date1 = 19980731; date2 = 19981231; output;
    permno = 12490; date1 = 19970101; date2 = 19971231; output;
    permno = 14322; date1 = 19950731; date2 = 19960131; output;
    permno = 25778; date1 = 19950101; date2 = 19950331; output;
run;

libname mstk2 sasecrsp "%sysget(CRSP_MSTK)" setid=20
              inset='testin2,PERMNO,PERMNO,DATE1,DATE2';

data b;
    set mstk2.prc;
run;

proc print data=b;
run;

```

The SAS Output Data Set

You can use the SAS DATA step to write the selected CRSP data to a SAS data set. This enables you to easily analyze the data by using SAS. When you specify the name of the output data set in the DATA statement, the engine supervisor creates a SAS data set by using the specified name in either the SAS Work library or, if specified, the User library.

The contents of the SAS data set include the date of each observation, the series name of each series read from the CRSPAccess database, event variables, and the label or description of each series/event or array.

You can use PROC PRINT and PROC CONTENTS to print your output data set and its contents. Alternatively, you can view your SAS output observations by opening the desired output data set in a SAS Explorer window. You can also use PROC SQL with the SASECRSP engine libref to create a custom view of your data.

In general, CRSP missing values are represented as ‘.’ in the SAS data set. When accessing the CRSP US STOCK data, the SASECRSP engine uses the mapping shown in [Table 47.5](#) for converting CRSP missing values into SAS missing codes.

Table 47.5 Mapping of CRSP Stock Missing Values to SAS Missing Codes

CRSP Stock	SAS	Condition
–99	.	No valid price
–88	.A	Out of range
–77	.B	Off-exchange
–66	.C	No valid previous price
–55	.D	No delisting information
–44	.E	No valid comparison for an excess return

Understanding CRSP Date Formats, Informats, and Functions

CRSP has historically used two different methods to represent dates, whereas SAS has used a third. The three formats are SAS dates, CRSP dates, and integer dates. The SASECRSP engine provides 23 functions, 15 informats, and 10 formats to enable you to easily translate the dates from one internal representation to another. A SASECRSP engine libref must be assigned prior to your use of the CRSP date formats, informats, and functions. See “[Example 47.6: Converting Dates by Using the CRSP Date Functions](#)” on page 3458.

SAS dates are stored internally as the number of days since January 1, 1960. The SAS method is an industry standard that provides a great deal of flexibility, including a wide variety of informats, formats, and functions.

CRSP dates are designed to ease time series storage and access. Internally, the dates are stored as an offset in an array of trading days or a trading-day calendar. There are five different CRSP trading-day calendars: Annual, Quarterly, Monthly, Weekly, and Daily. In this sense, there are five different types of CRSP dates, one for each frequency of calendar that it references. The CRSP method provides fewer missing values and makes trading period calculations very easy. However, many valid calendar dates are not available in the CRSP trading calendars, and you must be careful when you use other dates.

Integer dates are a way to represent dates that are platform-independent and maintain the correct sort order. However, the distance between dates is not maintained.

The best way to illustrate the various date formats is to use some sample data. [Table 47.6](#) shows date representations for CRSP daily and monthly data.

Table 47.6 Date Representations for Daily and Monthly Data

Date	SAS Date	CRSP Date (Daily)	CRSP Date (Monthly)	Integer Date
July 31, 1962	942	21	440	19620731
August 31, 1962	973	44	441	19620831
Dec. 30, 1998	14,243	9190	NA*	19981230
Dec. 31, 1998	14,244	9191	877	19981231

*Not available if an exact match is requested.

Having an understanding of the internal differences in representing SAS dates, CRSP dates, and CRSP integer dates helps you use the SASECRSP engine formats, informats, and functions effectively. Always keep in mind the frequency of the CRSP calendar that you are accessing when you specify a CRSP date.

The CRSP Date Formats

CRSP dates use two types of formats, and five frequencies are available for each type. The two types are exact dates (CRSPDT*) and range dates (CRSPDR*), where the ‘*’ can be A for annual, Q for quarterly, M for monthly, W for weekly, or D for daily. The ten types are CRSPDTA, CRSPDTQ, CRSPDTM, CRSPDTW, CRSPDTD, CRSPDRA, CRSPDRQ, CRSPDRM, CRSPDRW, and CRSPDRD.

Table 47.7 shows some samples that use the monthly and daily calendar as examples. The Annual (CRSPDTA and CRSPDRA), Quarterly (CRSPDTQ and CRSPDRQ), and Weekly (CRSPDTW and CRSPDRW) formats work analogously.

Table 47.7 Sample CRSPDT Formats for Daily and Monthly Data

Date	CRSP Date Daily, Monthly	CRSPDTD Daily Date	CRSPDRD Daily Range	CRSPDTM Monthly Date	CRSPDRM Monthly Range
July 31, 1962	21, 440	19620731	19620731†	19620731	19620630, 19620731
August 31, 1962	44, 441	19620831	19620831†	19620831	19620801, 19620831
Dec. 30, 1998	9190, NA*	19981230	19981230†	NA*	NA*
Dec. 31, 1998	9191, 877	19981231	19981231†	19981231	19981201, 19981231

†Daily ranges look similar to monthly ranges if they are Mondays or immediately follow a trading holiday.

*When you are working with exact matches, no CRSP monthly date exists for December 30, 1998.

The @CRSP Date Informats

CRSP dates use three types of informats, and five frequencies are available for each type. The three types are exact (@CRSPDT*), range (@CRSPDR*), and backward (@CRSPDB*) dates, where the '*' can be A for annual, Q for quarterly, M for monthly, W for weekly, or D for daily. The 15 formats are @CRSPDTA, @CRSPDTQ, @CRSPDTM, @CRSPDTW, @CRSPDTD, @CRSPDRA, @CRSPDRQ, @CRSPDRM, @CRSPDRW, @CRSPDRD, @CRSPDBA, @CRSPDBQ, @CRSPDBM, @CRSPDBW, and @CRSPDBD.

The five CRSPDT* informats find exact matches only. The five CRSPDR* informats look for an exact match, and if an exact match is not found, they go forward, matching the CRSPDR* formats. The five CRSPDB* informats look for an exact match, and if an exact match is not found, they go backward.

Table 47.8 shows a sample that uses only the CRSP monthly calendar as an example. The daily, weekly, quarterly, and annual frequencies work analogously.

Table 47.8 Sample @CRSP Date Informats Using Monthly Data

Input Date (Integer Date)	CRSP Date CRSPDTM	CRSP Date CRSPDRM	CRSP Date CRSPDBM	CRSPDTM Monthly Date	CRSPDRM Monthly Range
19620731	440	440	440	19620731	19620630 to 19620731
19620815	.(missing)	441	440	See below†	See below*
19620831	441	441	441	19620831	19620801 to 19620831

†Missing values are preserved. If 441, then 19620831. If 440, then 19620731.

*Missing values are preserved. If 441, then 19620801 to 19620831. If 440, then 19620630 to 19620731.

The CRSP Date Functions

Table 47.9 shows the 22 date functions that the SASECRSP engine provides. The engine uses these functions internally, but they are also available to end users. There are seven groups of functions. The first four groups have five functions each, one for each CRSP calendar frequency. The next two functions are for converting between SAS and integer date formats.

Table 47.9 CRSP Date Functions

Function Group	Function Name	Argument One	Argument Two	Return Value
CRSP dates to integer dates for December 31, 1998				
Annual	crspdcia	74	None	19981231
Quarterly	crspdcicq	293	None	19981231
Monthly	crspdcim	877	None	19981231
Weekly	crspdciw	1905	None	19981231
Daily	crspdcid	9191	None	19981231
CRSP dates to SAS dates for December 31, 1998				
Annual	crspdcsa	74	None	14,244
Quarterly	crspdcscq	293	None	14,244
Monthly	crspdcsm	877	None	14,244
Weekly	crspdcsw	1905	None	14,244
Daily	crspdcscd	9191	None	14,244
Integer dates to CRSP dates exact is illustrated, but can be forward or backward				
Annual	crspdica	19981231	0	74
Quarterly	crspdicq	19981231	0	293
Monthly	crspdicm	19981231	0	877
Weekly	crspdicw	19981231	0	1905
Daily	crspdicd	19981231	0	9191
SAS dates to CRSP dates exact is illustrated, but can be forward or backward				
Annual	crspdsca	14,244	0	74
Quarterly	crspdsccq	14,244	0	293
Monthly	crspdsesm	14,244	0	877
Weekly	crspdsesw	14,244	0	1905
Daily	crspdsesd	14,244	0	9191
Integer dates to SAS dates for December 31, 1998				
Integer to SAS	crspdi2s	19981231	None	14,244
SAS dates to integer dates for December 31, 1998				
SAS to Integer	crspds2i	14,244	None	19981231

Data Elements Reference: SASECRSP Interface Engine

Data sets are made available based on the type of CRSP database that you open. Table 47.10 and Table 47.11 show summary views of the two types of CRSP databases (Stock and Indices) and the data sets that they make available. Tables that contain details about the data sets, including their specific fields, immediately follow the summary tables. You can also see the available data sets for an opened database via the SAS Explorer by opening a SASECRSP engine libref that you previously assigned.

Table 47.10 Summary of All Available Data Sets by CRSP Database Type

CRSP Database	Data Set Name	Reference Table Title	Reference Table
CRSP US Stock Database (STOCK)	STKHEAD	Header Identification and Summary Data	Table 47.12
	NAMES	Name History Array	Table 47.13
	DISTS	Distribution Event Array	Table 47.14
	SHARES	Shares Outstanding Observation Array	Table 47.15
	DELIST	Delisting History Array	Table 47.16
	NASDIN	NASDAQ Information Array	Table 47.17
	PRC	Price or Bid/Ask Average Time Series	Table 47.18
	RET	Returns Time Series	Table 47.18
	BIDLO	Bid or Low Price Time Series	Table 47.18
	ASKHI	Ask or High Price Time Series	Table 47.18
	BID	Bid Time Series	Table 47.18
	ASK	Ask Time Series	Table 47.18
	RETX	Returns Without Dividends Time Series	Table 47.18
	SPREAD	Spread Between Bid and Ask	Table 47.18
	ALTPRC	Price Alternate Time Series	Table 47.18
	VOL	Volume Time Series	Table 47.18
	NUMTRD	Number of Trades Time Series	Table 47.18
	ALTPRCDT	Price Alternate Date Time Series	Table 47.18
	PORT1	Portfolio Data for Portfolio Type 1	Table 47.19
	PORT2	Portfolio Data for Portfolio Type 2	Table 47.19
	PORT3	Portfolio Data for Portfolio Type 3	Table 47.19
	PORT4	Portfolio Data for Portfolio Type 4	Table 47.19
	PORT5	Portfolio Data for Portfolio Type 5	Table 47.19
	PORT6	Portfolio Data for Portfolio Type 6	Table 47.19
	PORT7	Portfolio Data for Portfolio Type 7	Table 47.19
	PORT8	Portfolio Data for Portfolio Type 8	Table 47.19
	PORT9	Portfolio Data for Portfolio Type 9	Table 47.19
	GROUP16	Group Data for Group Type 16	Table 47.19

Table 47.11 Summary of All Available Data Sets by CRSP Database Type

CRSP Database	Data Set Name	Reference Table Title	Reference Table
CRSP Indices Database (IND)	INDHEAD	Index Header Data	Table 47.20
	REBAL	Index Rebalancing History Arrays	Table 47.21
	REBAL	Index Rebalancing History Group Arrays	Table 47.22
	LIST	Index Membership List Arrays	Table 47.23
	LIST	Index Membership List Groups Arrays	Table 47.24
	USDCNT	Portfolio Used Count Array	Table 47.25
	TOTCNT	Portfolio Total Count Array	Table 47.26
	USDCNT	Portfolio Used Count Time Series Groups	Table 47.27
	TOTCNT	Portfolio Total Count Time Series Groups	Table 47.28
	USDVAL	Portfolio Used Value Array	Table 47.29
	TOTVAL	Portfolio Total Value Array	Table 47.30
	USDVAL	Portfolio Used Value Time Series Groups	Table 47.31
	TOTVAL	Portfolio Total Value Time Series Groups	Table 47.32
	TRET	Total Returns Time Series	Table 47.33
	ARET	Appreciation Returns Time Series	Table 47.34
	IRET	Income Returns Time Series	Table 47.35
	TRET	Total Returns Time Series Groups	Table 47.36
	ARET	Income Returns Time Series Groups	Table 47.37
	IRET	Income Returns Time Series Groups	Table 47.38
	TIND	Total Return Index Levels Time Series	Table 47.39
	AIND	Appreciation Index Levels Time Series	Table 47.40
	IIND	Income Index Levels Time Series	Table 47.41
	TIND	Total Return Index Levels Groups	Table 47.42
	AIND	Appreciation Index Levels Groups	Table 47.43
	IIND	Income Index Levels Time Series Groups	Table 47.44

Available CRSP Stock Data Sets

STKHEAD Data Set—Header Identification and Summary Data

Table 47.12 STKHEAD Data Set—Header Identification and Summary Data

Field	Label	Type
PERMNO	PERMNO	Numeric
PERMCO	PERMCO	Numeric
COMPNO	NASDAQ Company Number	Numeric
ISSUNO	NASDAQ Issue Number	Numeric
HEXCD	Exchange Code Header	Numeric
HSHRCD	Share Code Header	Numeric
HSICCD	Standard Industrial Classification Code	Numeric

Table 47.12 *continued*

Field	Label	Type
BEGDT	Begin of Stock data	Numeric
ENDDT	End of Stock data	Numeric
DLSTCD	Delisting Code Header	Numeric
HCUSIP	CUSIP Header	Character
HTICK	Ticker Symbol Header	Character
HCOMNAM	Company Name Header	Character
HTSYMBOL	Trading Symbol Header	Character
HNAICS	North American Industry Classification Header	Character
HPRIMEXC	Primary Exchange Header	Character
HTRDSTAT	Trading Status Header	Character
HSECSTAT	Security Status Header	Character

NAMES Data Set—Name History Array**Table 47.13** NAMES Data Set—Name History Array

Field	Label	Type
PERMNO	PERMNO	Numeric
NAMEDT	Names Date	Numeric
NAMEENDT	Names Ending Date	Numeric
SHRCD	Share Code	Numeric
EXCHCD	Exchange Code	Numeric
SICCD	Standard Industrial Classification Code	Numeric
NCUSIP	CUSIP	Numeric
TICKER	Ticker Symbol	Character
COMNAM	Company Name	Character
SHRCLS	Share Class	Numeric
TSYMBOL	Trading Symbol	Character
NAICS	North American Industry Classification System	Character
PRIMEXCH	Primary Exchange	Character
TRDSTAT	Trading Status	Character
SECSTAT	Security Status	Character

DISTS Data Set—Distribution Event Array**Table 47.14** DISTS Data Set—Distribution Event Array

Field	Label	Type
PERMNO	PERMNO	Numeric
DISTCD	Distribution Code	Numeric
DIVAMT	Dividend Cash Amount	Numeric
FACPR	Factor to Adjust Price	Numeric
FACSHR	Factor to Adjust Share	Numeric

Table 47.14 *continued*

Field	Label	Type
DCLRDT	Distribution Declaration Date	Numeric
EXDT	Ex-Distribution Date	Numeric
RCRDDT	Record Date	Numeric
PAYDT	Payment Date	Numeric
ACPERM	Acquiring PERMNO	Numeric
ACCOMP	Acquiring PERMCO	Numeric

SHARES Data Set—Shares Outstanding Observation Array**Table 47.15** SHARES Data Set—Shares Outstanding Observation Array

Field	Label	Type
PERMNO	PERMNO	Numeric
SHROUT	Shares Outstanding	Numeric
SHRSDT	Shares Observation Date	Numeric
SHRENDT	Shares Observation End Date	Numeric
SHRFLG	Shares Outstanding Observation Flag	Numeric

DELIST Data Set—Delisting History Array**Table 47.16** DELIST Data Set—Delisting History Array

Field	Label	Type
PERMNO	PERMNO	Numeric
DLSTDT	Delisting Date	Numeric
DLSTCD	Delisting Code	Numeric
NWPERM	New PERMNO	Numeric
NWCOMP	New PERMCO	Numeric
NEXTD	Delisting Next Price Date	Numeric
DLAMT	Delisting Amount	Numeric
DLRETX	Delisting Return Without Dividends	Numeric
DLPRC	Delisting Price	Numeric
DLPDT	Delisting Amount Date	Numeric
DLRET	Delisting Return	Numeric

NASDIN Data Set—NASDAQ Information Array**Table 47.17** NASDIN Data Set—NASDAQ Information Array

Field	Label	Type
PERMNO	PERMNO	Numeric
TRTSCD	NASDAQ Traits Code	Numeric
TRTSDT	NASDAQ Traits Date	Numeric
TRTSENDT	NASDAQ Traits End Date	Numeric
NMSIND	NASDAQ National Market Indicator	Numeric
MMCNT	Market Maker Count	Numeric
NSDINX	NASD Index Code	Numeric

STOCK Time Series Data Sets**Table 47.18** STOCK Time Series Data Sets

Data Set Name, Long Name	Field	Label	Type
PRC	PERMNO	PERMNO	Numeric
Price or Bid/Ask	CALDT	Calendar Trading Date	Numeric
Average Time Series	PRC	Price or Bid/Ask Aver	Numeric
RET	PERMNO	PERMNO	Numeric
Returns Time Series	CALDT	Calendar Trading Date	Numeric
	RET	Returns	Numeric
ASKHI	PERMNO	PERMNO	Numeric
Ask or High Price	CALDT	Calendar Trading Date	Numeric
Time Series	ASKHI	Ask or High Price	Numeric
BIDLO	PERMNO	PERMNO	Numeric
Bid or Low Price	CALDT	Calendar Trading Date	Numeric
Time Series	BIDLO	Bid or Low Price	Numeric
BID	PERMNO	PERMNO	Numeric
Bid Time Series	CALDT	Calendar Trading Date	Numeric
	BID	Bid	Numeric
ASK	PERMNO	PERMNO	Numeric
Ask Time Series	CALDT	Calendar Trading Date	Numeric
	ASK	Ask	Numeric
RETX	PERMNO	PERMNO	Numeric
Returns without	CALDT	Calendar Trading Date	Numeric
Dividends	RETX	Returns w/o Dividends	Numeric
SPREAD	PERMNO	PERMNO	Numeric
Spread Between Bid	CALDT	Calendar Trading Date	Numeric
and Ask Time Series	SPREAD	Spread Between Bid Ask	Numeric

Table 47.18 *continued*

Data Set Name, Long Name	Field	Label	Type
ALTPRC	PERMNO	PERMNO	Numeric
Price Alternate	CALDT	Calendar Trading Date	Numeric
Time Series	ALTPRC	Price Alternate	Numeric
VOL	PERMNO	PERMNO	Numeric
Volume Time Series	CALDT	Calendar Trading Date	Numeric
	VOL	Volume	Numeric
NUMTRD	PERMNO	PERMNO	Numeric
Number of Trades	CALDT	Calendar Trading Date	Numeric
Time Series	NUMTRD	Number of Trades	Numeric
ALTPRCDT	PERMNO	PERMNO	Numeric
Alternate Price	CALDT	Calendar Trading Date	Numeric
Date Time Series	ALTPRCDT	Alternate Price Date	Numeric

Portfolio and Group Data Sets

Table 47.19 Portfolio and Group Data Sets

Data Set	Fields	Label	Type
PORT1	PERMNO	PERMNO	Numeric
Portfolio data	CALDT	Calendar Trading Date	Numeric
for Portfolio	PORT1	Portfolio Assignment for Portfolio Type 1	Numeric
Type 1	STAT1	Portfolio Statistic for Portfolio Type 1	Numeric
PORT2	PERMNO	PERMNO	Numeric
Portfolio data	CALDT	Calendar Trading Date	Numeric
for Portfolio	PORT2	Portfolio Assignment for Portfolio Type 2	Numeric
Type 2	STAT2	Portfolio Statistic for Portfolio Type 2	Numeric
PORT3	PERMNO	PERMNO	Numeric
Portfolio data	CALDT	Calendar Trading Date	Numeric
for Portfolio	PORT3	Portfolio Assignment for Portfolio Type 3	Numeric
Type 3	STAT3	Portfolio Statistic for Portfolio Type 3	Numeric
PORT4	PERMNO	PERMNO	Numeric
Portfolio data	CALDT	Calendar Trading Date	Numeric
for Portfolio	PORT4	Portfolio Assignment for Portfolio Type 4	Numeric
Type 4	STAT4	Portfolio Statistic for Portfolio Type 4	Numeric
PORT5	PERMNO	PERMNO	Numeric
Portfolio data	CALDT	Calendar Trading Date	Numeric
for Portfolio	PORT5	Portfolio Assignment for Portfolio Type 5	Numeric
Type 5	STAT5	Portfolio Statistic for Portfolio Type 5	Numeric

Table 47.19 *continued*

Data Set	Fields	Label	Type
PORT6 Portfolio data for Portfolio Type 6	PERMNO	PERMNO	Numeric
	CALDT	Calendar Trading Date	Numeric
	PORT6	Portfolio Assignment for Portfolio Type 6	Numeric
	STAT6	Portfolio Statistic for Portfolio Type 6	Numeric
PORT7 Portfolio data for Portfolio Type 7	PERMNO	PERMNO	Numeric
	CALDT	Calendar Trading Date	Numeric
	PORT7	Portfolio Assignment for Portfolio Type 7	Numeric
	STAT7	Portfolio Statistic for Portfolio Type 7	Numeric
PORT8 Portfolio data for Portfolio Type 8	PERMNO	PERMNO	Numeric
	CALDT	Calendar Trading Date	Numeric
	PORT8	Portfolio Assignment for Portfolio Type 8	Numeric
	STAT8	Portfolio Statistic for Portfolio Type 8	Numeric
PORT9 Portfolio data for Portfolio Type 9	PERMNO	PERMNO	Numeric
	CALDT	Calendar Trading Date	Numeric
	PORT9	Portfolio Assignment for Portfolio Type 9	Numeric
	STAT9	Portfolio Statistic for Portfolio Type 9	Numeric
GROUP16 Group data for Group Type 16	PERMNO	PERMNO	Numeric
	GRPDT	Group Beginning Date	Numeric
	GRPENDDT	Group Ending Date	Numeric
	GRPFLAG	Group Flag of Associated Index	Numeric
	GRPSU	Group Subflag	Numeric

Available CRSP Indices Data Sets

INDHEAD Data Set—CRSP Index Header Data

Table 47.20 INDHEAD Data Set—CRSP Index Header Data

Field	Label	Type
INDNO	Permanent index identification number	Numeric
INDCO	Permanent index group identification number	Numeric
PRIMFLAG	Index primary link	Numeric
PORTNUM	Portfolio number if subset series	Numeric
INDNAME	Index Name	Character
GROUPNAM	Index Group Name	Character

REBAL Data Set—Index Rebalancing History Arrays**Table 47.21** REBAL Data Set—Index Rebalancing History Arrays

Field	Label	Type
INDNO	INDNO	Numeric
RBEGDT	Rebalancing beginning date	Numeric
RENDT	Rebalancing ending date	Numeric
USDCNT	Count used as of rebalancing	Numeric
MAXCNT	Maximum count during period	Numeric
TOTCNT	Available count as of rebalancing	Numeric
ENDCNT	Count at end of period	Numeric
MINID	Identifier at minimum value	Numeric
MAXID	Identifier at maximum value	Numeric
MINSTA	Smallest statistic in period	Numeric
MAXSTA	Largest statistic in period	Numeric
MEDSTA	Median statistic in period	Numeric
AVGSTA	Average statistic in period	Numeric

REBAL Group Data Set—Index Rebalancing History Group Array**Table 47.22** REBAL Group Data Set—Index Rebalancing History Group Array

Field	Label	Type
INDNO	INDNO	Numeric
RBEGDT1	Rebalancing beginning date for port 1	Numeric
RBEGDT2	Rebalancing beginning date for port 2	Numeric
RBEGDT3	Rebalancing beginning date for port 3	Numeric
RBEGDT4	Rebalancing beginning date for port 4	Numeric
RBEGDT5	Rebalancing beginning date for port 5	Numeric
RBEGDT6	Rebalancing beginning date for port 6	Numeric
RBEGDT7	Rebalancing beginning date for port 7	Numeric
RBEGDT8	Rebalancing beginning date for port 8	Numeric
RBEGDT9	Rebalancing beginning date for port 9	Numeric
RBEGDT10	Rebalancing beginning date for port 10	Numeric
RENDT1	Rebalancing ending date for port 1	Numeric
RENDT2	Rebalancing ending date for port 2	Numeric
RENDT3	Rebalancing ending date for port 3	Numeric
RENDT4	Rebalancing ending date for port 4	Numeric
RENDT5	Rebalancing ending date for port 5	Numeric
RENDT6	Rebalancing ending date for port 6	Numeric
RENDT7	Rebalancing ending date for port 7	Numeric
RENDT8	Rebalancing ending date for port 8	Numeric
RENDT9	Rebalancing ending date for port 9	Numeric

Table 47.22 *continued*

Field	Label	Type
RENDDT10	Rebalancing ending date for port 10	Numeric
USDCNT1	Count used as of rebalancing for port 1	Numeric
USDCNT2	Count used as of rebalancing for port 2	Numeric
USDCNT3	Count used as of rebalancing for port 3	Numeric
USDCNT4	Count used as of rebalancing for port 4	Numeric
USDCNT5	Count used as of rebalancing for port 5	Numeric
USDCNT6	Count used as of rebalancing for port 6	Numeric
USDCNT7	Count used as of rebalancing for port 7	Numeric
USDCNT8	Count used as of rebalancing for port 8	Numeric
USDCNT9	Count used as of rebalancing for port 9	Numeric
USDCNT10	Count used as of rebalancing for port10	Numeric
MAXCNT1	Maximum count during period for port 1	Numeric
MAXCNT2	Maximum count during period for port 2	Numeric
MAXCNT3	Maximum count during period for port 3	Numeric
MAXCNT4	Maximum count during period for port 4	Numeric
MAXCNT5	Maximum count during period for port 5	Numeric
MAXCNT6	Maximum count during period for port 6	Numeric
MAXCNT7	Maximum count during period for port 7	Numeric
MAXCNT8	Maximum count during period for port 8	Numeric
MAXCNT9	Maximum count during period for port 9	Numeric
MAXCNT10	Maximum count during period for port 10	Numeric
TOTCNT1	Available count as of rebalancing for port 1	Numeric
TOTCNT2	Available count as of rebalancing for port 2	Numeric
TOTCNT3	Available count as of rebalancing for port 3	Numeric
TOTCNT4	Available count as of rebalancing for port 4	Numeric
TOTCNT5	Available count as of rebalancing for port 5	Numeric
TOTCNT6	Available count as of rebalancing for port 6	Numeric
TOTCNT7	Available count as of rebalancing for port 7	Numeric
TOTCNT8	Available count as of rebalancing for port 8	Numeric
TOTCNT9	Available count as of rebalancing for port 9	Numeric
TOTCNT10	Available count as of rebalancing for port10	Numeric
ENDCNT1	Count at end of period for port 1	Numeric
ENDCNT2	Count at end of period for port 2	Numeric
ENDCNT3	Count at end of period for port 3	Numeric
ENDCNT4	Count at end of period for port 4	Numeric
ENDCNT5	Count at end of period for port 5	Numeric
ENDCNT6	Count at end of period for port 6	Numeric
ENDCNT7	Count at end of period for port 7	Numeric
ENDCNT8	Count at end of period for port 8	Numeric
ENDCNT9	Count at end of period for port 9	Numeric
ENDCNT10	Count at end of period for port 10	Numeric
MINID1	Identifier at minimum value for port 1	Numeric
MINID2	Identifier at minimum value for port 2	Numeric
MINID3	Identifier at minimum value for port 3	Numeric

Table 47.22 *continued*

Field	Label	Type
MINID4	Identifier at minimum value for port 4	Numeric
MINID5	Identifier at minimum value for port 5	Numeric
MINID6	Identifier at minimum value for port 6	Numeric
MINID7	Identifier at minimum value for port 7	Numeric
MINID8	Identifier at minimum value for port 8	Numeric
MINID9	Identifier at minimum value for port 9	Numeric
MINID10	Identifier at minimum value for port 10	Numeric
MAXID1	Identifier at maximum value for port 1	Numeric
MAXID2	Identifier at maximum value for port 2	Numeric
MAXID3	Identifier at maximum value for port 3	Numeric
MAXID4	Identifier at maximum value for port 4	Numeric
MAXID5	Identifier at maximum value for port 5	Numeric
MAXID6	Identifier at maximum value for port 6	Numeric
MAXID7	Identifier at maximum value for port 7	Numeric
MAXID8	Identifier at maximum value for port 8	Numeric
MAXID9	Identifier at maximum value for port 9	Numeric
MAXID10	Identifier at maximum value for port 10	Numeric
MINSTA1	Smallest statistic in period for port 1	Numeric
MINSTA2	Smallest statistic in period for port 2	Numeric
MINSTA3	Smallest statistic in period for port 3	Numeric
MINSTA4	Smallest statistic in period for port 4	Numeric
MINSTA5	Smallest statistic in period for port 5	Numeric
MINSTA6	Smallest statistic in period for port 6	Numeric
MINSTA7	Smallest statistic in period for port 7	Numeric
MINSTA8	Smallest statistic in period for port 8	Numeric
MINSTA9	Smallest statistic in period for port 9	Numeric
MINSTA10	Smallest statistic in period for port 10	Numeric
MAXSTA1	Largest statistic in period for port 1	Numeric
MAXSTA2	Largest statistic in period for port 2	Numeric
MAXSTA3	Largest statistic in period for port 3	Numeric
MAXSTA4	Largest statistic in period for port 4	Numeric
MAXSTA5	Largest statistic in period for port 5	Numeric
MAXSTA6	Largest statistic in period for port 6	Numeric
MAXSTA7	Largest statistic in period for port 7	Numeric
MAXSTA8	Largest statistic in period for port 8	Numeric
MAXSTA9	Largest statistic in period for port 9	Numeric
MAXSTA10	Largest statistic in period for port 10	Numeric
MEDSTA1	Median statistic in period for port 1	Numeric
MEDSTA2	Median statistic in period for port 2	Numeric
MEDSTA3	Median statistic in period for port 3	Numeric
MEDSTA4	Median statistic in period for port 4	Numeric
MEDSTA5	Median statistic in period for port 5	Numeric
MEDSTA6	Median statistic in period for port 6	Numeric
MEDSTA7	Median statistic in period for port 7	Numeric

Table 47.22 *continued*

Field	Label	Type
MEDSTA8	Median statistic in period for port 8	Numeric
MEDSTA9	Median statistic in period for port 9	Numeric
MEDSTA10	Median statistic in period for port 10	Numeric
AVGSTA1	Average statistic in period for port 1	Numeric
AVGSTA2	Average statistic in period for port 2	Numeric
AVGSTA3	Average statistic in period for port 3	Numeric
AVGSTA4	Average statistic in period for port 4	Numeric
AVGSTA5	Average statistic in period for port 5	Numeric
AVGSTA6	Average statistic in period for port 6	Numeric
AVGSTA7	Average statistic in period for port 7	Numeric
AVGSTA8	Average statistic in period for port 8	Numeric
AVGSTA9	Average statistic in period for port 9	Numeric
AVGSTA10	Average statistic in period for port 10	Numeric

LIST Data Set—Index Membership List Arrays**Table 47.23** LIST Data Set—Index Membership List Arrays

Field	Label	Type
INDNO	INDNO	Numeric
PERMNO	Issue identifier	Numeric
BEGDT	First date included	Numeric
ENDDT	Last date included	Numeric
SUBIND	Code for subcategory of list	Numeric
WEIGHT	Weight during range	Numeric

LIST Group Data Set—Index Membership List Group Arrays**Table 47.24** LIST Group Data Set—Index Membership List Group Arrays

Field	Label	Type
INDNO	INDNO	Numeric
PERMNO1	Issue identifier	Numeric
BEGDT1	First date included	Numeric
ENDDT1	Last date included	Numeric
SUBIND1	Code for subcategory of list	Numeric
WEIGHT1	Weight during range	Numeric

USDCNT Data Set—Portfolio Used Count Array**Table 47.25** USDCNT Data Set—Portfolio Used Count Array

Field	Label	Type
INDNO	INDNO	Numeric
CALDT	Calendar Trading Date	Numeric
USDCNT	Portfolio Used Count	Numeric

TOTCNT Data Set—Portfolio Total Count Array**Table 47.26** TOTCNT Data Set—Portfolio Total Count Array

Field	Label	Type
INDNO	INDNO	Numeric
CALDT	Calendar Trading Date	Numeric
TOTCNT	Portfolio Used Count	Numeric

USDCNT Group Data Set—Portfolio Used Time Series Group**Table 47.27** USDCNT Group Data Set—Portfolio Used Time Series Group

Field	Label	Type
INDNO	INDNO	Numeric
CALDT	Calendar Trading Date	Numeric
USDCNT1	Used Count for Port 1	Numeric
USDCNT2	Used Count for Port 2	Numeric
USDCNT3	Used Count for Port 3	Numeric
USDCNT4	Used Count for Port 4	Numeric
USDCNT5	Used Count for Port 5	Numeric
USDCNT6	Used Count for Port 6	Numeric
USDCNT7	Used Count for Port 7	Numeric
USDCNT8	Used Count for Port 8	Numeric
USDCNT9	Used Count for Port 9	Numeric
USDCNT10	Used Count for Port 10	Numeric
USDCNT11	Used Count for Port 11	Numeric
USDCNT12	Used Count for Port 12	Numeric
USDCNT13	Used Count for Port 13	Numeric
USDCNT14	Used Count for Port 14	Numeric
USDCNT15	Used Count for Port 15	Numeric
USDCNT16	Used Count for Port 16	Numeric
USDCNT17	Used Count for Port 17	Numeric

TOTCNT Group Data Set—Portfolio Total Count Time Series Groups**Table 47.28** TOTCNT Group Data Set—Portfolio Total Count Time Series Groups

Field	Label	Type
INDNO	INDNO	Numeric
CALDT	Calendar Trading Date	Numeric
TOTCNT1	Total Count for Port 1	Numeric
TOTCNT2	Total Count for Port 2	Numeric
TOTCNT3	Total Count for Port 3	Numeric
TOTCNT4	Total Count for Port 4	Numeric
TOTCNT5	Total Count for Port 5	Numeric
TOTCNT6	Total Count for Port 6	Numeric
TOTCNT7	Total Count for Port 7	Numeric
TOTCNT8	Total Count for Port 8	Numeric
TOTCNT9	Total Count for Port 9	Numeric
TOTCNT10	Total Count for Port10	Numeric
TOTCNT11	Total Count for Port11	Numeric
TOTCNT12	Total Count for Port12	Numeric
TOTCNT13	Total Count for Port13	Numeric
TOTCNT14	Total Count for Port14	Numeric
TOTCNT15	Total Count for Port15	Numeric
TOTCNT16	Total Count for Port16	Numeric
TOTCNT17	Total Count for Port17	Numeric

USDVAL Data Set—Portfolio Used Value Array**Table 47.29** USDVAL Data Set—Portfolio Used Value Array

Field	Label	Type
INDNO	INDNO	Numeric
CALDT	Calendar Trading Date	Numeric
USDVAL	Portfolio Used Value	Numeric

TOTVAL Data Set—Portfolio Total Value Array**Table 47.30** TOTVAL Data Set—Portfolio Total Value Array

Field	Label	Type
INDNO	INDNO	Numeric
CALDT	Calendar Trading Date	Numeric
TOTVAL	Portfolio Total Value	Numeric

USDVAL Group Data Set—Portfolio Used Value Time Series Groups**Table 47.31** USDVAL Group Data Set—Portfolio Used Value Time Series Groups

Field	Label	Type
INDNO	INDNO	Numeric
CALDT	Calendar Trading Date	Numeric
USDVAL1	Used Value for Port 1	Numeric
USDVAL2	Used Value for Port 2	Numeric
USDVAL3	Used Value for Port 3	Numeric
USDVAL4	Used Value for Port 4	Numeric
USDVAL5	Used Value for Port 5	Numeric
USDVAL6	Used Value for Port 6	Numeric
USDVAL7	Used Value for Port 7	Numeric
USDVAL8	Used Value for Port 8	Numeric
USDVAL9	Used Value for Port 9	Numeric
USDVAL10	Used Value for Port 10	Numeric
USDVAL11	Used Value for Port 11	Numeric
USDVAL12	Used Value for Port 12	Numeric
USDVAL13	Used Value for Port 13	Numeric
USDVAL14	Used Value for Port 14	Numeric
USDVAL15	Used Value for Port 15	Numeric
USDVAL16	Used Value for Port 16	Numeric
USDVAL17	Used Value for Port 17	Numeric

TOTVAL Group Data Set—Portfolio Total Value Time Series Groups**Table 47.32** TOTVAL Group Data Set—Portfolio Total Value Time Series Groups

Field	Label	Type
INDNO	INDNO	Numeric
CALDT	Calendar Trading Date	Numeric
TOTVAL1	Total Value for Port 1	Numeric
TOTVAL2	Total Value for Port 2	Numeric
TOTVAL3	Total Value for Port 3	Numeric
TOTVAL4	Total Value for Port 4	Numeric
TOTVAL5	Total Value for Port 5	Numeric
TOTVAL6	Total Value for Port 6	Numeric
TOTVAL7	Total Value for Port 7	Numeric
TOTVAL8	Total Value for Port 8	Numeric
TOTVAL9	Total Value for Port 9	Numeric
TOTVAL10	Total Value for Port10	Numeric
TOTVAL11	Total Value for Port11	Numeric
TOTVAL12	Total Value for Port12	Numeric

Table 47.32 *continued*

Field	Label	Type
TOTVAL13	Total Value for Port13	Numeric
TOTVAL14	Total Value for Port14	Numeric
TOTVAL15	Total Value for Port15	Numeric
TOTVAL16	Total Value for Port16	Numeric
TOTVAL17	Total Value for Port17	Numeric

TRET Data Set—Total Returns Time Series**Table 47.33** TRET Data Set—Total Returns Time Series

Field	Label	Type
INDNO	INDNO	Numeric
CALDT	Calendar Trading Date	Numeric
TRET	Total Returns	Numeric

ARET Data Set—Appreciation Returns Time Series**Table 47.34** ARET Data Set—Appreciation Returns Time Series

Field	Label	Type
INDNO	INDNO	Numeric
CALDT	Calendar Trading Date	Numeric
ARET	Appreciation Returns Time Series	Numeric

IRET Data Set—Income Returns Time Series**Table 47.35** IRET Data Set—Income Returns Time Series

Field	Label	Type
INDNO	INDNO	Numeric
CALDT	Calendar Trading Date	Numeric
IRET	Income Returns	Numeric

TRET Group Data Set—Total Returns Time Series Groups**Table 47.36** TRET Group Data Set—Total Returns Time Series Groups

Field	Label	Type
INDNO	INDNO	Numeric
CALDT	Calendar Trading Date	Numeric
TRET1	Total Returns for Port 1	Numeric
TRET2	Total Returns for Port 2	Numeric
TRET3	Total Returns for Port 3	Numeric
TRET4	Total Returns for Port 4	Numeric
TRET5	Total Returns for Port 5	Numeric
TRET6	Total Returns for Port 6	Numeric
TRET7	Total Returns for Port 7	Numeric
TRET8	Total Returns for Port 8	Numeric
TRET9	Total Returns for Port 9	Numeric
TRET10	Total Returns for Port 10	Numeric
TRET11	Total Returns for Port 11	Numeric
TRET12	Total Returns for Port 12	Numeric
TRET13	Total Returns for Port 13	Numeric
TRET14	Total Returns for Port 14	Numeric
TRET15	Total Returns for Port 15	Numeric
TRET16	Total Returns for Port 16	Numeric
TRET17	Total Returns for Port 17	Numeric

ARET Group Data Set—Appreciation Returns Time Series Groups**Table 47.37** ARET Group Data Set—Appreciation Returns Time Series Groups

Field	Label	Type
INDNO	INDNO	Numeric
CALDT	Calendar Trading Date	Numeric
ARET1	Appreciation Returns for Port 1	Numeric
ARET2	Appreciation Returns for Port 2	Numeric
ARET3	Appreciation Returns for Port 3	Numeric
ARET4	Appreciation Returns for Port 4	Numeric
ARET5	Appreciation Returns for Port 5	Numeric
ARET6	Appreciation Returns for Port 6	Numeric
ARET7	Appreciation Returns for Port 7	Numeric
ARET8	Appreciation Returns for Port 8	Numeric
ARET9	Appreciation Returns for Port 9	Numeric
ARET10	Appreciation Returns for Port 10	Numeric
ARET11	Appreciation Returns for Port 11	Numeric
ARET12	Appreciation Returns for Port 12	Numeric

Table 47.37 *continued*

Field	Label	Type
ARET13	Appreciation Returns for Port 13	Numeric
ARET14	Appreciation Returns for Port 14	Numeric
ARET15	Appreciation Returns for Port 15	Numeric
ARET16	Appreciation Returns for Port 16	Numeric
ARET17	Appreciation Returns for Port 17	Numeric

IRET Group Data Set—Income Returns Time Series Groups**Table 47.38** IRET Group Data Set—Income Returns Time Series Groups

Field	Label	Type
INDNO	INDNO	Numeric
CALDT	Calendar Trading Date	Numeric
IRET1	Income Returns for Port 1	Numeric
IRET2	Income Returns for Port 2	Numeric
IRET3	Income Returns for Port 3	Numeric
IRET4	Income Returns for Port 4	Numeric
IRET5	Income Returns for Port 5	Numeric
IRET6	Income Returns for Port 6	Numeric
IRET7	Income Returns for Port 7	Numeric
IRET8	Income Returns for Port 8	Numeric
IRET9	Income Returns for Port 9	Numeric
IRET10	Income Returns for Port 10	Numeric
IRET11	Income Returns for Port 11	Numeric
IRET12	Income Returns for Port 12	Numeric
IRET13	Income Returns for Port 13	Numeric
IRET14	Income Returns for Port 14	Numeric
IRET15	Income Returns for Port 15	Numeric
IRET16	Income Returns for Port 16	Numeric
IRET17	Income Returns for Port 17	Numeric

TIND Data Set—Total Return Index Levels Time Series**Table 47.39** TIND Data Set—Total Return Index Levels Time Series

Field	Label	Type
INDNO	INDNO	Numeric
CALDT	Calendar Trading Date	Numeric
TIND	Total Return Index Levels	Numeric

AIND Data Set—Appreciation Index Levels Time Series**Table 47.40** AIND Data Set—Appreciation Index Levels Time Series

Field	Label	Type
INDNO	INDNO	Numeric
CALDT	Calendar Trading Date	Numeric
AIND	Appreciation Index Levels	Numeric

IIND Data Set—Income Index Levels Time Series**Table 47.41** IIND Data Set—Income Index Levels Time Series

Field	Label	Type
INDNO	INDNO	Numeric
CALDT	Calendar Trading Date	Numeric
IIND	Income Index Levels	Numeric

TIND Group Data Set—Total Return Index Levels Time Series Groups**Table 47.42** TIND Group Data Set—Total Return Index Levels Time Series Groups

Field	Label	Type
INDNO	INDNO	Numeric
CALDT	Calendar Trading Date	Numeric
TIND1	Total Return Index Levels for Port 1	Numeric
TIND2	Total Return Index Levels for Port 2	Numeric
TIND3	Total Return Index Levels for Port 3	Numeric
TIND4	Total Return Index Levels for Port 4	Numeric
TIND5	Total Return Index Levels for Port 5	Numeric
TIND6	Total Return Index Levels for Port 6	Numeric
TIND7	Total Return Index Levels for Port 7	Numeric
TIND8	Total Return Index Levels for Port 8	Numeric
TIND9	Total Return Index Levels for Port 9	Numeric
TIND10	Total Return Index Levels for Port 10	Numeric
TIND11	Total Return Index Levels for Port 11	Numeric
TIND12	Total Return Index Levels for Port 12	Numeric
TIND13	Total Return Index Levels for Port 13	Numeric
TIND14	Total Return Index Levels for Port 14	Numeric
TIND15	Total Return Index Levels for Port 15	Numeric
TIND16	Total Return Index Levels for Port 16	Numeric
TIND17	Total Return Index Levels for Port 17	Numeric

AIND Group Data Set—Appreciation Index Levels Groups**Table 47.43** AIND Group Data Set—Appreciation Index Levels Groups

Field	Label	Type
INDNO	INDNO	Numeric
CALDT	Calendar Trading Date	Numeric
AIND1	Appreciation Index Levels for Port 1	Numeric
AIND2	Appreciation Index Levels for Port 2	Numeric
AIND3	Appreciation Index Levels for Port 3	Numeric
AIND4	Appreciation Index Levels for Port 4	Numeric
AIND5	Appreciation Index Levels for Port 5	Numeric
AIND6	Appreciation Index Levels for Port 6	Numeric
AIND7	Appreciation Index Levels for Port 7	Numeric
AIND8	Appreciation Index Levels for Port 8	Numeric
AIND9	Appreciation Index Levels for Port 9	Numeric
AIND10	Appreciation Index Levels for Port 10	Numeric
AIND11	Appreciation Index Levels for Port 11	Numeric
AIND12	Appreciation Index Levels for Port 12	Numeric
AIND13	Appreciation Index Levels for Port 13	Numeric
AIND14	Appreciation Index Levels for Port 14	Numeric
AIND15	Appreciation Index Levels for Port 15	Numeric
AIND16	Appreciation Index Levels for Port 16	Numeric
AIND17	Appreciation Index Levels for Port 17	Numeric

IIND Group Data Set—Income Index Levels Time Series Groups**Table 47.44** IIND Group Data Set—Income Index Levels Time Series Groups

Field	Label	Type
INDNO	INDNO	Numeric
CALDT	Calendar Trading Date	Numeric
IIND1	Income Index Levels for Port 1	Numeric
IIND2	Income Index Levels for Port 2	Numeric
IIND3	Income Index Levels for Port 3	Numeric
IIND4	Income Index Levels for Port 4	Numeric
IIND5	Income Index Levels for Port 5	Numeric
IIND6	Income Index Levels for Port 6	Numeric
IIND7	Income Index Levels for Port 7	Numeric
IIND8	Income Index Levels for Port 8	Numeric
IIND9	Income Index Levels for Port 9	Numeric
IIND10	Income Index Levels for Port 10	Numeric
IIND11	Income Index Levels for Port 11	Numeric
IIND12	Income Index Levels for Port 12	Numeric

Table 47.44 *continued*

Field	Label	Type
IIND13	Income Index Levels for Port 13	Numeric
IIND14	Income Index Levels for Port 14	Numeric
IIND15	Income Index Levels for Port 15	Numeric
IIND16	Income Index Levels for Port 16	Numeric
IIND17	Income Index Levels for Port 17	Numeric

Examples: SASECRSP Interface Engine

Example 47.1: Specifying PERMNOs and Range in the LIBNAME Statement

The following statements show how to set up a LIBNAME statement to extract data for certain selected PERMNOs during a specific time period. The result is shown in [Output 47.1.1](#).

```

title2 'Define a range inside the data range';
title3 'My range is ( 19950101-19960630 )';

libname _all_ clear;
libname testit1 sasecrsp "/r/tappan/vol/vol1/crsp1/data201212/MIZ201212/"
    setid=20
    permno=81871      /* Desired PERMNOs are selected */
    permno=82200      /* via the libname PERMNO= option */
    permno=82224
    permno=83435
    permno=83696
    permno=83776
    permno=84788
    range='19950101-19960630';

proc print data=testit1.ask;
run;
```

Output 47.1.1 ASK Monthly Time Series Data with RANGE= Option

Define a range inside the data range
My range is (19950101-19960630)

Obs	PERMNO	CALDT	ASK
1	81871	19950731	18.25000
2	81871	19950831	19.25000
3	81871	19950929	26.00000
4	81871	19951031	26.00000
5	81871	19951130	25.50000
6	81871	19951229	24.25000
7	81871	19960131	22.00000
8	81871	19960229	32.50000
9	81871	19960329	30.25000
10	81871	19960430	33.75000
11	81871	19960531	27.50000
12	81871	19960628	30.50000
13	82200	19950831	49.50000
14	82200	19950929	62.75000
15	82200	19951031	88.00000
16	82200	19951130	138.50000
17	82200	19951229	139.25000
18	82200	19960131	164.25000
19	82200	19960229	51.00000
20	82200	19960329	41.62500
21	82200	19960430	61.25000
22	82200	19960531	68.25000
23	82200	19960628	62.50000
24	82224	19950929	46.50000
25	82224	19951031	48.50000
26	82224	19951130	47.75000
27	82224	19951229	49.75000
28	82224	19960131	49.00000
29	82224	19960229	47.00000
30	82224	19960329	53.00000
31	82224	19960430	55.50000
32	82224	19960531	54.25000
33	82224	19960628	51.00000
34	83435	19960430	30.25000
35	83435	19960531	28.00000
36	83435	19960628	21.00000
37	83696	19960628	19.12500

Example 47.2: Using the LIBNAME Statement to Access All Keys

To set up the libref to access all keys, no key options such as PERMNO=, TICKER=, or GVKEY= are specified in the LIBNAME statement and no INSET= option is used. Any of these options cause the SASECRSP engine to limit access to specified keys or specified insets. When no such options are specified, the SASECRSP engine correctly defaults to selecting all keys in the database. Other LIBNAME statement options, such as the RANGE= option, can still be used normally to limit the time span of the data—in other words, to define the date range of observations.

This example does not use key-specifying options. This forces the engine to default to all PERMNOs in the monthly STK database. The range that is specified in the LIBNAME statement behaves normally, and data are limited to the first two months of 1995.

```
title2 'Define a range inside the data range ';
title3 'My range is ( 19950101-19950228 )';

libname _all_ clear;
libname testit2 sasecrsp "/r/tappan/vol/vol1/crsp1/data201212/MIZ201212/"
    setid=20
    range='19950101-19950228';
data a;
    set testit2.ask(obs=30);
run;

proc print data=a;
run;
```

The result is shown in [Output 47.2.1](#).

Output 47.2.1 All PERMNOs of ASK Monthly Time Series Data with RANGE= Option

Define a range inside the data range
My range is (19950101-19950228)

Obs	PERMNO	CALDT	ASK
1	10001	19950131	8.00000
2	10001	19950228	8.00000
3	10002	19950131	13.50000
4	10002	19950228	13.50000
5	10003	19950131	2.12500
6	10003	19950228	2.25000
7	10009	19950131	18.00000
8	10009	19950228	18.75000
9	10010	19950131	5.37500
10	10010	19950228	4.87500
11	10011	19950131	14.62500
12	10011	19950228	13.50000
13	10012	19950131	2.25000
14	10012	19950228	2.12500
15	10016	19950131	7.00000
16	10016	19950228	8.50000
17	10018	19950131	1.12500
18	10018	19950228	1.12500
19	10019	19950131	10.62500
20	10019	19950228	11.62500
21	10021	19950131	11.75000
22	10021	19950228	12.00000
23	10025	19950131	18.50000
24	10025	19950228	19.00000
25	10026	19950131	11.00000
26	10026	19950228	11.75000
27	10028	19950131	1.87500
28	10028	19950228	2.00000
29	10032	19950131	12.50000
30	10032	19950228	12.75000

Example 47.3: Accessing One PERMNO without the RANGE= Option

The SASECRSP engine defaults to providing access to the entire range of available data when you do not restrict the range (that is, when you do not use the RANGE= option).

This example shows access of the entire range of available data for one particular PERMNO extracted from the monthly data set.

```
title2 'Select only PERMNO = 81871';
title3 'Valid trading dates (19890131--19981231)';
title4 'No range option, leave wide open';

libname _all_ clear;
libname testit3 sasecrsp "/r/tappan/vol/vol1/crsp1/data201212/MIZ201212/"
      setid=20
      permno=81871;

data c;
    set testit3.ask;
run;

proc print data=c;
run;
```

The result is shown in [Output 47.3.1](#).

Output 47.3.1 PERMNO=81871 of ASK Monthly Time Series Data without RANGE= Option

Select only PERMNO = 81871
Valid trading dates (19890131--19981231)
No range option, leave wide open

Obs	PERMNO	CALDT	ASK
1	81871	19950731	18.25000
2	81871	19950831	19.25000
3	81871	19950929	26.00000
4	81871	19951031	26.00000
5	81871	19951130	25.50000
6	81871	19951229	24.25000
7	81871	19960131	22.00000
8	81871	19960229	32.50000
9	81871	19960329	30.25000
10	81871	19960430	33.75000
11	81871	19960531	27.50000
12	81871	19960628	30.50000
13	81871	19960731	26.12500
14	81871	19960830	19.12500
15	81871	19960930	19.50000
16	81871	19961031	14.00000
17	81871	19961129	18.75000
18	81871	19961231	24.25000
19	81871	19970131	29.75000
20	81871	19970228	24.37500
21	81871	19970331	15.00000
22	81871	19970430	18.25000
23	81871	19970530	25.12500
24	81871	19970630	31.12500
25	81871	19970731	35.00000
26	81871	19970829	33.00000
27	81871	19970930	26.81250
28	81871	19971031	18.37500
29	81871	19971128	16.50000
30	81871	19971231	16.25000
31	81871	19980130	22.75000
32	81871	19980227	21.00000
33	81871	19980331	22.50000
34	81871	19980430	16.12500
35	81871	19980529	11.12500
36	81871	19980630	13.43750
37	81871	19980731	22.87500
38	81871	19980831	17.75000
39	81871	19980930	24.25000
40	81871	19981030	26.00000

Example 47.4: Specifying Keys by Using the INSET= Option

The INSET= option enables you to select any companies or issues for which you want data. This example selects two CRSP Index Series from the CRSP Indices data, and four securities from the CRSP US Stock data for data extraction. Note that because each CRSP database might be in a different location and must be opened separately, a total of two different librefs are used, one for each database.

```
data indices;
    indno=1000000; output; /* NYSE Value-Weighted Market Index */
    indno=1000001; output; /* NYSE Equal-Weighted Market Index */
run;

libname _all_ clear;
libname ind2 sasocrsp "/r/tappan/vol/vol1/crsp1/data201212/MIZ201212/"
    setid=420
    inset='indices,INDNO,INDNO'
    range='19990101-19990401';

title2 'Total Returns for NYSE Value- and Equal-Weighted Market Indices';
proc print data=ind2.tret label;
run;
```

Output 47.4.1 shows the result of selecting two CRSP Index Series from the CRSP Indices data.

Output 47.4.1 IND Data Extracted Using INSET= Option

Total Returns for NYSE Value- and Equal-Weighted Market Indices

Obs	INDNO	Calendar Trading Date	Total Returns
1	1000000	19990129	0.012583
2	1000000	19990226	-0.024169
3	1000000	19990331	0.028691
4	1000001	19990129	-0.007700
5	1000001	19990226	-0.041183
6	1000001	19990331	0.015101

The following statements select three securities from the CRSP US Stock data by using TICKER keys in the INSET= option for data extraction:

```
data securities;
    ticker='BAC'; output; /* Bank of America */
    ticker='DUK'; output; /* Duke Energy */
    ticker='GSK'; output; /* GlaxoSmithKline */
run;

libname sec3 sasocrsp "/r/tappan/vol/vol1/crsp1/data201212/MIZ201212/"
    setid=20
    inset='securities,TICKER,TICKER'
    range='19970820-19970920';
```

```

title2 'PERMNOs and General Header Info of Selected TICKERs';
proc print data=sec3.stkhead(keep=permno htick htssymbol) label;
run;
title3 'Average Price for Bank of America, Duke and GlaxoSmithKline';
proc print data=sec3.prc label;
run;

```

Output 47.4.2 shows the STK header data for the TICKER keys that are specified by using the INSET= option.

Output 47.4.2 STK Header Data Extracted Using INSET= Option

PERMNOs and General Header Info of Selected TICKERs

		Ticker Symbol	Trading Symbol
Obs	PERMNO	Header	Header
1	59408	BAC	BAC
2	27959	DUK	DUK
3	75064	GSK	GSK

Output 47.4.3 shows the STK price data for the TICKER keys that are specified by using the INSET= option.

Output 47.4.3 STK Price Data Extracted Using INSET= Option

PERMNOs and General Header Info of Selected TICKERs
Average Price for Bank of America, Duke and GlaxoSmithKline

		Calendar Trading Date	Price or Bid/Ask Average
Obs	PERMNO		
1	59408	19970829	59.75000
2	27959	19970829	48.43750
3	75064	19970829	39.93750

Example 47.5: Specifying Ranges for Individual Keys with the INSET= Option

Insets enable you to define options that are specific to each individual key. This example uses an inset to select four PERMNOs and specifies a different date restriction for each PERMNO.

```

title2 'INSET=testin2 uses date ranges along with PERMNOs: ';
title3 '10107, 12490, 14322, 25788';
title4 'Begin dates and end dates for each permno are used in the INSET';

data testin2;
    permno = 10107; date1 = 19980731; date2 = 19981231; output;
    permno = 12490; date1 = 19970101; date2 = 19971231; output;
    permno = 14322; date1 = 19950731; date2 = 19960131; output;
    permno = 25778; date1 = 19950101; date2 = 19950331; output;
run;

libname _all_ clear;
libname mstk2 sasecrsp "/r/tappan/vol/vol1/crsp1/data201212/MIZ201212/"
    setid=20
    inset='testin2,PERMNO,PERMNO,DATE1,DATE2';

data b;
    set mstk2.prc;
run;

proc print data=b;
run;

```

Output 47.5.1 shows CRSP US Stock price time series data selected by PERMNO in the INSET= option, where each PERMNO has its own time span specified in the INSET= option.

Output 47.5.1 PRC Monthly Time Series Using the INSET= Option

**INSET=testin2 uses date ranges along with PERMNOs:
10107, 12490, 14322, 25788**

Begin dates and end dates for each permno are used in the INSET

Obs	PERMNO	CALDT	PRC
1	10107	19980731	109.93750
2	10107	19980831	95.93750
3	10107	19980930	110.06250
4	10107	19981030	105.87500
5	10107	19981130	122.00000
6	10107	19981231	138.68750
7	12490	19970131	156.87500
8	12490	19970228	143.75000
9	12490	19970331	137.25000
10	12490	19970430	160.50000
11	12490	19970530	86.50000
12	12490	19970630	90.25000
13	12490	19970731	105.75000
14	12490	19970829	101.37500
15	12490	19970930	106.00000
16	12490	19971031	98.50000
17	12490	19971128	109.50000
18	12490	19971231	104.62500
19	14322	19950731	32.62500
20	14322	19950831	32.37500
21	14322	19950929	36.87500
22	14322	19951031	34.00000
23	14322	19951130	39.37500
24	14322	19951229	39.00000
25	14322	19960131	41.50000
26	25778	19950131	49.87500
27	25778	19950228	57.25000
28	25778	19950331	59.37500

Example 47.6: Converting Dates by Using the CRSP Date Functions

This example shows how to use the CRSP date functions and formats. The CRSPDTD formats are used for all the crspdt variables, and the 'YYMMDD' format is used for the sasdt variables.

```

title2 'OUT= Data Set';
title3 'CRSP Functions for sasecrsp';

libname _all_ clear;

/* Always assign the LIBNAME sasecrsp first */
libname mstk sasecrsp "/r/tappan/vol/vol1/crsp1/data201212/MIZ201212/"
    setid=20;

data a (keep = crspdt crspdt2 crspdt3
            sasdt sasdt2 sasdt3
            intdt intdt2 intdt3);
    format crspdt crspdt2 crspdt3 crspdtd8.;
    format sasdt sasdt2 sasdt3 yymmdd6.;
    format intdt intdt2 intdt3 8.;
    format exact 2.;
    crspdt = 1;
    sasdt = '2jul1962'd;
    intdt = 19620702;
    exact = 0;

/* Call the CRSP date to Integer function*/
    intdt2 = crspdcid(crspdt);

/* Call the SAS date to Integer function*/
    intdt3 = crspds2i(sasdt);

/* Call the Integer to CRSP date function*/
    crspdt2 = crspdicd(intdt,exact);

/* Call the SAS date to CRSP date conversion function*/
    crspdt3 = crspdsd(sasdt,exact);

/* Call the CRSP date to SAS date conversion function*/
    sasdt2 = crspdcscd(crspdt);

/* Call the Integer to SAS date conversion function*/
    sasdt3 = crspdi2s(intdt);
run;

title3 'PROC PRINT showing data for sasecrsp';
proc print data=a;
run;

title3 'PROC CONTENTS showing formats for sasecrsp';
proc contents data=a;
run;

```

Output 47.6.1 shows the OUT= data set that is created by the DATA step.

Output 47.6.1 Date Conversions by Using the CRSP Date Functions

OUT= Data Set
PROC PRINT showing data for sasecrsp

Obs	crspdt	crspdt2	crspdt3	sasdt	sasdt2	sasdt3	intdt	intdt2	intdt3
1	19251231	19620702	19620702	620702	251231	620702	19620702	19251231	19620702

Output 47.6.2 shows the contents of the OUT= data set by alphabetically listing the variables and their attributes.

Output 47.6.2 Contents of Date Conversions by Using the CRSP Date Functions

Alphabetic List of Variables and Attributes				
#	Variable	Type	Len	Format
1	crspdt	Num	8	CRSPDTD8.
2	crspdt2	Num	8	CRSPDTD8.
3	crspdt3	Num	8	CRSPDTD8.
7	intdt	Num	8	8.
8	intdt2	Num	8	8.
9	intdt3	Num	8	8.
4	sasdt	Num	8	YYMMDD6.
5	sasdt2	Num	8	YYMMDD6.
6	sasdt3	Num	8	YYMMDD6.

References

- Center for Research in Security Prices (2002a). *CRSP Programmer's Guide*. Chicago: CRSP, Chicago Booth. <http://www.crsp.chicagobooth.edu/documentation/>.
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