Construct Spectrum and SDK

Installation Guide for Mainframes

Manual Order Number: SPE451-010IBM

This document applies to Construct Spectrum and SDK Version 4.5 and to all subsequent releases.

Specifications contained herein are subject to change and these changes will be reported in subsequent release notes or new editions.

Readers' comments are welcomed. Comments may be addressed to the Documentation Department at the address on the back cover or to the following e-mail address:

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2. INSTALLING THE MAINFRAME COMPONENTS

PREFACE

The *Construct Spectrum and SDK Installation Guide for Mainframes* describes the installation of the server components of Construct Spectrum and Construct Spectrum SDK. Natural Construct V4.5 must already be installed. This preface will help you get the most benefit from this guide, as well as find other sources of information about Construct Spectrum.

The following topics are covered:

Purpose and Structure of this Documentation

This guide describes how to install and set up the Construct Spectrum runtime and SDK components on the mainframe. The information in this guide is intended for Natural administrators and others who are responsible for installing, maintaining, and monitoring the Natural application development and production environments. You will learn how to install and operate the Spectrum Administration subsystem on mainframe platforms.

The following table describes the information contained in each chapter:

Chapter	Title	Description
1	**Before You Begin**, page 13	Describes the installation prerequisites and the installation tape for the Construct Spectrum Administration subsystem and SDK.
2	**Installing the Mainframe Components**, page 29	Describes how to install the mainframe components of the Spectrum Administration subsystem and SDK.

Document Conventions

This guide uses the following typographical conventions:

Example	Description
Introduction	Bolded text in cross references indicates chapter and section titles.
"A"	Items within quotation marks indicate values you must enter.
Browse model, GotFocus, Enter	Mixed case text indicates names of: • Natural Construct and Construct Spectrum editors, fields, files, functions, models, panels, parameters, subsystems, variables, and dialogs • Visual Basic classes, constants, controls, dialogs, events, files, menus, methods, properties, and variables • Keys
Alt+F1	A plus sign (+) between two key names indicates that you must press the keys together to invoke a function. For example, Alt+F1 means hold down the Alt key while pressing the F1 key.
CHANGE-HISTORY	Uppercase text indicates the names of Natural command keywords, command operands, data areas, helproutines, libraries, members, parameters, programs, statements, subprograms, subroutines, user exits, and utilities.
Construct Spectrum and SDK Installation Guide, *variable name*	Italicized text indicates: • Book titles • Placeholders for information you must supply
[*variable*]	In syntax and code examples, values within square brackets indicate optional items.
{WHILE|UNTIL}	In syntax examples, values within brace brackets indicate a choice between two or more items; each item is separated by a vertical bar (|).

Other Resources

This section provides information about other resources you can use to learn more about Construct Spectrum and Natural Construct. For more information about these documents and courses, contact the nearest Software AG office or visit the website at www.softwareag.com to order documents or view course schedules and locations. You can also use the website to email questions to Customer Support.

Related Documentation

This section lists other documentation in the Construct Spectrum and Natural Construct documentation set.

Construct Spectrum SDK

- *Construct Spectrum SDK Reference*
  This guide is for developers creating Natural modules and ActiveX Business Objects to support applications that will run in the Natural mainframe environment and a Windows environment and/or an internet server.
- *Construct Spectrum SDK for Microsoft .NET Framework*
  This guide is for developers creating Microsoft .NET Web services to invoke Natural subprograms (business objects) over the Inter/Intranet via the W3C SOAP standard.
- *Construct Spectrum SDK for Web Applications*
  This guide is for developers creating the web components of applications. It describes how to use the Construct Spectrum wizards in Visual Basic to generate HTML templates, page handlers, and object factory entries. It also contains detailed information about customizing, debugging, deploying, and securing web applications.
- *Construct Spectrum SDK for Client/Server Applications*
  This guide is for developers creating client components for applications that will run in the Natural mainframe environment (server) and a Windows environment (client).
- *Construct Spectrum Messages*
  This documentation is for application developers, application administrators, and system administrators who want to investigate messages returned by Construct Spectrum runtime and SDK components.

Construct Spectrum

- *Construct Spectrum Reference*
  This documentation is for application developers and administrators who need quick access to information about Construct Spectrum application programming interfaces (APIs) and utilities.
- *Construct Spectrum Administration*
  This guide is for administrators who want to use the Construct Spectrum Administration subsystem to set up and manage Construct Spectrum applications.
- *Construct Spectrum and SDK Vn Release Notes*
  This document describes the new features, support requirements, and changes in this release of Construct Spectrum and Construct Spectrum SDK.
- *Construct Spectrum and SDK Installation Guide for Windows*
  This guide describes how to install and set up the Construct Spectrum runtime and SDK components on the client.

Natural Construct

- *Natural Construct Generation*
  This documentation describes how to use the Natural Construct models to generate applications that will run in a mainframe environment.
- *Natural Construct Administration and Modeling*
  This documentation describes how to use the Administration subsystem of Natural Construct and how to create new models.
- *Natural Construct Help Text*
  This documentation describes how to create online help for applications that run on server platforms.
- *Natural Construct Getting Started Guide*
  This guide introduces new users to Natural Construct and provides step-by-step instructions to create several common processes.

Other Documentation

This section lists documents published by WH&O International:

- *Natural Construct Tips & Techniques*
  This book provides a reference of tips and techniques for developing and supporting Natural Construct applications.
- *Natural Construct Application Development User's Guide*
  This guide describes the basics of generating Natural Construct modules using the supplied models.
- *Natural Construct Study Guide*
  This guide is intended for programmers who have never used Natural Construct.

Related Courses

In addition to the documentation, the following courses are available from Software AG:

- A self-study course on Natural Construct fundamentals
- An instructor-led course on building applications with Natural Construct
- An instructor-led course on modifying the existing Natural Construct models or creating your own models

BEFORE YOU BEGIN

This chapter describes the installation prerequisites and the installation tape for the Construct Spectrum Administration subsystem and SDK. It includes a description of the dataset-naming conventions, as well as sample JCL you can use to copy the datasets from tape to disk.

The following topics are covered:

Prerequisites

The following sections describe the prerequisites for installing the Construct Spectrum Administration subsystem on the mainframe. This documentation assumes you are installing Construct Spectrum for the first time or upgrading from Construct Spectrum V4.3.1 or V4.4.1. If you are upgrading from any other version, read the release notes and installation guides for all versions between your current version and V4.4.1 and perform the required procedures.

To use the online job submission features, the NATRJE module must be installed and operational (see your Natural Installation and Operations documentation).

Construct Spectrum

Before installing Construct Spectrum, the following products must be installed on your server:

- Natural Construct V4.5.1 or higher
- Natural V3.1.6 or higher
- (Optional) Natural Security V3.1 or higher

The Spectrum Administration subsystem installation tape includes sample JCL for the installation (see the SPE*nnn*.JOBS dataset).

Construct Spectrum SDKs

Before installing the Construct Spectrum software development kits (SDKs), the following products must be installed on your server:

- Adabas V7.1 or higher
- Construct Spectrum V4.5.1 or higher
- EntireX Broker V6.2.1 or higher (OS/390)
- Entire Net-Work V5.5.1 or EntireX configured to use TCP/IP as the network transport protocol
- EntireX Message Broker V4.2.1 (OS/390)

Operating Environments

This section describes the operating environments for Construct Spectrum and includes a listing of the operating systems on which you can run Construct Spectrum.

Operating Systems

The Spectrum Administration subsystem V4.5 functions in any environment that supports Natural V3.1.6 or higher, including the following operating systems:

- OS/390
- VSE/ESA
- BS2000/OSD

Like Natural, the Spectrum Administration subsystem runs under the following teleprocessing monitors:

- Com-plete
- IMS/DC
- CICS
- TSO

Dataset-Naming Conventions

The Spectrum Administration subsystem and Construct Spectrum SDK installation tapes use a dataset-naming convention that identifies the product, version number, release number, system maintenance level, and dataset type. For example, the Construct Spectrum installation tape includes the following dataset:

`SPE`*`nnn`*`.INPL`

This dataset name consists of the following components:

Component	Description
SPE	Product code
n	Version number
n	Release number
n	System maintenance level
INPL	Dataset type

Spectrum Administration Installation Tape

The Spectrum Administration subsystem installation tape contains the datasets described in this section. The *Report of Tape Creation* lists the volume serial number, media type, dataset names, and dataset sequence numbers. It also indicates the record layouts and disk storage required for each dataset.

The installation tape contains the following common datasets (applicable to all environments), where *nnn* indicates the version number, release number, and system maintenance (SM) level of Construct Spectrum:

Dataset Name	Description
SPE*nnn*.INPL	INPL dataset containing the Spectrum Administration subsystem modules.
SPE*nnn*.IUPD	INPL dataset containing updates and fixes to the main INPL dataset. Load this dataset after loading the SPE*nnn*.INPL dataset.
Note:	This dataset is only supplied if there are updates or fixes to the main INPL dataset.
SPE*nnn*.SYSF	Dataset containing the Natural Construct file definition required to load help text for the Spectrum Administration subsystem. Use this dataset as input to the Adabas ADALOD load utility.
SPE*nnn*.ERRN	SYSERR dataset containing messages used by the Spectrum Administration subsystem.
SPE*nnn*.SYSH	Dataset containing help text used by the Spectrum Administration subsystem.
SPE*nnn*.SYS1	Dataset containing the Spectrum Administration subsystem file. This file contains secured data used as input to the Adabas ADALOD load utility.
SPE*nnn*.SYS2	Dataset containing the Spectrum Administration subsystem data file. This file contains unsecured data used as input to the Adabas ADALOD load utility.

OS/390 and BS2000/OSD Users

For OS/390 and BS2000/OSD users, the installation tape contains the following additional datasets:

Dataset Name	Description
SPE*nnn*.JOBS	Dataset containing sample OS JCL for all functions required to install the Spectrum Administration subsystem.
SPE*nnn*.SRCE	Dataset containing a sample Natural parameter module for use by Construct Spectrum.

VSE/ESA Users

For VSE/ESA users, the installation tape contains the following additional dataset:

Dataset Name	Description
SPE*nnn*.LIBJ	Dataset containing three kinds of books: books containing all source members (Source books), books containing all sample JCL (JCL books), and books containing all object code (Object books).

Construct Spectrum SDK Installation Tape

The Construct Spectrum SDK installation tape contains the datasets described in this section. The *Report of Tape Creation* lists the volume serial number, media type, dataset names, and dataset sequence numbers. It also indicates the record layouts and disk storage required for each dataset.

The installation tape contains the following datasets, where *nnn* indicates the version number, release number, and system maintenance (SM) level of Construct Spectrum SDK:

Name	Description
SPV*nnn*.INPL	INPL dataset containing all Natural Construct V4.5 model subprograms and data areas required for the Subprogram-Proxy model, Visual Basic models, and the VB-Client-Server-Super-Model model. It also contains the Construct Spectrum demo application.
SPV*nnn*.SYSM	Dataset containing the Natural Construct V4.5 model definitions for the Subprogram-Proxy model, the Visual Basic models, and the VB-Client-Server-Super-Model model.
SPV*nnn*.SYSR	Dataset containing the Natural Construct V4.5 code frames for models included in the SPV*nnn*.SYSM dataset.
SPV*nnn*.LIBJ	Dataset containing JCL samples to install the Construct Spectrum SDK for VSE/ESA users.
SPV*nnn*.JOBS	Dataset containing JCL samples for all functions required to install Construct Spectrum SDK.

Installation Jobs

To install Software AG products, use installation jobs created:

- Using System Maintenance Aid (SMA)
- Manually using JCL

If you create the installation jobs manually, use the JCL sample described in **Copying the Datasets to Disk**, page 23. Adapt the sample job to your requirements.

Using System Maintenance Aid (SMA)

You can install Construct Spectrum and the Construct Spectrum SDK using Software AG's System Maintenance Aid (SMA); the Construct Spectrum SDK has no special parameter requirements.

Note: SMA is not available for the CMS operating system.

➢ To use SMA for the installation process, perform the following steps before generating the jobs:

1 Load the SMA table data as described in the System Maintenance Aid (SMA) documentation.

2 In the list of available products for your environment, set one of the following to TO BE INSTALLED:

– If installing Construct Spectrum, specify SPE45*n*, where *n* is the system maintenance level.

– If installing the Construct Spectrum SDK, specify SPV45*n*, where *n* is the system maintenance level.

Note: If you are installing the product for the first time, adapt the FSPE1, FSPE2, and FSPE-DBID parameters in the FILNUM parameter group to the required values.

For information about using SMA, see **Using System Maintenance Aid**, page 19, *Natural Construct Installation Guide for Mainframes.*

To use SMA to install Construct Spectrum, set the following options in your SMA environment (on the Environment Values panel). Since options may be set from a previous installation, ensure that you check all options before generating the jobs:

SMA Name	Description
SPE-SECDATA-CIPHERED	To cipher the Construct Spectrum secured data, specify “Y”. If you do not want to cipher secured data, specify “N”.
Note:	If SPE-SECDATA-CIPHERED=Y and SMS=N, set VOL-AUSBA and VOL-FEHL (OS/390).
SPE-FIRST-INSTALL	To install Construct Spectrum for the first time (never installed before), specify “Y”. To install Construct Spectrum to update a previous version, specify “N”.
SPE-ASSEMBLE-ADALNK (OS/390)	To create a reentrant Natural nucleus (allows multiple dispatchers to run in a batch region), link the nucleus with ADALNKR or a reentrant ADALNK. For details, see **Step 3: Create a New Reentrant Natural Nucleus (Batch)**, page 33.
FSPE1	File number for the Construct Spectrum secured data file.
FSPE2	File number for the Construct Spectrum unsecured data file.
FSPE-DBID	Database number for the Construct Spectrum system files.
ESIZE-NAT (BS2000/OSD only)	ESIZE for batch environments (minimum is 120).
ESIZE-NRT (BS2000/OSD only)	ESIZE for TIAM environments (minimum is 120).
ESIZE-NUT (BS2000/OSD only)	ESIZE for UTM environments (minimum is 120).
ESIZE-BATCH (OS/390 only)	ESIZE for batch environments (minimum is 120).
ESIZE-ONLINE (OS/390 only)	ESIZE for online environments (minimum is 120).
DATSIZE-BATCH	DATSIZE for batch environments (minimum is 180).

SMA Name	Description (continued)
DATSIZE-ONLINE	DATSIZE for online environments (minimum is 180).
SYNERR	SYNERR option, which must be set to “ON”.
SSIZE	SSIZE value (minimum is 40).
SPV-FIRST-INSTALL	To install the Construct Spectrum SDK for the first time (never installed before), specify “Y”. To install the Construct Spectrum SDK to update a previous version, specify “N”.

Copying the Datasets to Disk

You may want to copy the datasets on the installation tapes to disk. The disk storage required for each dataset is given in the *Report of Tape Creation.*

The procedure to copy the datasets to disk differs, depending on whether you are using System Maintenance Aid (SMA). If you are using SMA, refer to the System Maintenance Aid (SMA) documentation (included on the current edition of the Natural documentation CD).

If you are not using SMA, see the following sections.

Note: Under Natural Security, you may have to supply a user ID in the JCL.

OS/390

Note: If the datasets for more than one product are on the tape, the COPY.JOB dataset contains the JCL to unload the datasets for all products. You must then perform the individual installation procedure for each component.

Step 1: Copy the COPY.JOB Dataset from Tape to Disk

The COPY.JOB dataset (label 2) contains the JCL to unload all other datasets from the installation tape to disk. To unload COPY.JOB, use the following sample JCL:

```
//SAGTAPE JOB SAG,CLASS=1,MSGCLASS=X
//* --------------------------------
//COPY EXEC PGM=IEBGENER
//SYSUT1 DD DSN=COPY.JOB,
// DISP=(OLD,PASS),
// UNIT=(CASS,,DEFER),
// VOL=(,RETAIN,SER=<Tnnnnn>),
// LABEL=(2,SL)
//SYSUT2 DD DSN=<hilev>.COPY.JOB,
// DISP=(NEW,CATLG,DELETE),
// UNIT=3390,VOL=SER=<vvvvvv>,
// SPACE=(TRK,(1,1),RLSE),
// DCB=*.SYSUT1
//SYSPRINT DD SYSOUT=*
//SYSIN DD DUMMY
//
```

where:

`<hilev>`	is a valid high level qualifier
`<Tnnnnn>`	is the tape number
`<vvvvvv>`	is the desired volser

Step 2: Modify COPY.JOB to Conform to Your Naming Conventions

Before submitting this job, set the following parameters:

- Set HILEV to a valid high-level qualifier.
- Set LOCATION to a storage location.
- Set EXPDT to a valid expiration date.

Step 3: Submit the Job

To unload all other datasets from the tape to your disk, submit COPY.JOB.

VSE/ESA

Note: If the datasets for more than one product are on the tape, the COPYTAPE.JOB member contains the JCL to unload the datasets for all delivered products (except datasets you can install directly from tape, such as INPL objects). You must then perform the individual installation procedure for each component.

Step 1: Copy the COPYTAPE.JOB Dataset from Tape to Disk

The COPYTAPE.JOB dataset (file 5) contains the JCL to unload all other datasets from tape to disk. To unload COPYTAPE.JOB, use the following sample JCL:

```
* $$ JOB JNM=LIBRCAT,CLASS=0,                                          +
* $$ DISP=D,LDEST=(*,UID),SYSID=1
* $$ LST CLASS=A,DISP=D
// JOB LIBRCAT
* ***************************************
*     CATALOG COPYTAPE.JOB TO LIBRARY
* ***************************************
// ASSGN SYS004,NNN                                <------  tape address
// MTC REW,SYS004
// MTC FSF,SYS004,4
ASSGN SYSIPT,SYS004
// TLBL IJSYSIN,'COPYTAPE.JOB'
// EXEC LIBR,PARM='MSHP; ACC S=lib.sublib'         <------- for catalog
/*
// MTC REW,SYS004
ASSGN SYSIPT,FEC
/*
/&
* $$ EOJ
```

where:

`NNN`	is the tape address
`lib.sublib`	is the library and sublibrary of the catalog

Step 2: Modify COPYTAPE.JOB to Conform to Your Naming Conventions

Before submitting this job, modify COPYTAPE.JOB to conform to your local naming conventions and set the disk space parameters.

Step 3: Submit COPYTAPE.JOB

To unload all other datasets from the tape to your disk, submit COPYTAPE.JOB.

BS2000/OSD

To copy the tape to disk, perform the following steps.

Step 1: Copy the SRVnnn.LIB Library from Tape to Disk

Note: This step is not required if you have already copied the SRVnnn.LIB library from another Software AG tape. For more information, see the #READ-ME file in this library.

The SRVnnn.LIB library is stored on the tape as the SRVnnn.LIBS sequential file containing LMS commands. The current version nnn can be obtained from the *Report of Tape Creation*.

To convert the SRVnnn.LIBS sequential file into an LMS-library, execute the following commands:

```
/IMPORT-FILE  SUPPORT=*TAPE(FILE-NAME=SRVnnn.LIBS, -
/   VOLUME=<volser>, DEV-TYPE=<tape-device>)
/ADD-FILE-LINK  LINK-NAME=EDTSAM, FILE-NAME=SRVnnn.LIBS, -
/   SUPPORT=*TAPE(FILE-SEQ=3), ACC-METH=*BY-CAT, -
/   BUF-LEN=*BY-CAT, REC-FORM=*BY-CAT, REC-SIZE=*BY-CAT
/START-EDT
@READ  '/'
@SYSTEM 'REMOVE-FILE-LINK  EDTSAM'
@SYSTEM 'EXPORT-FILE  FILE-NAME=SRVnnn.LIBS'
@WRITE  'SRVnnn.LIBS'
@HALT
/ASS-SYSDTA  SRVnnn.LIBS
/MOD-JOB-SW  ON=1
/START-PROG  $LMS
/MOD-JOB-SW  OFF=1
/ASS-SYSDTA  *PRIMARY
```

where:

`<tape-device>`	is the device-type of the tape (for example, TAPE-C4)
`<volser>`	is the VOLSER of the tape (see the *Report of Tape Creation*)

Step 2: Copy the COPY.PROC Procedure from Tape to Disk

To copy the COPY.PROC procedure to disk, call the P.COPYTAPE procedure in the SRVnnn.LIB library:

```
/CALL-PROCEDURE  (SRVnnn.LIB,P.COPYTAPE), -
/   (VSNT=<volser>, DEVT=<tape-device>)
```

Note: If you use a TAPE-C4 device, you can omit the DEVT parameter.

Step 3: Copy all Product Files from Tape to Disk

To copy all Software AG product files from tape to disk, enter the COPY.PROC procedure:

```
/ENTER-PROCEDURE  COPY.PROC, DEVT=<tape-device>
```

Note: If you use a TAPE-C4 device, you can omit the DEVT parameter. The result from this procedure is written to the 'L.REPORT.SRV' file.

VM/CMS

To copy the tape to disk, perform the following steps.

Step 1: Position the Tape for the TAPE LOAD Command

To position the tape for the TAPE LOAD command, calculate the number of tape marks as follows:

If the sequence number of SPE*nnn*.TAPE, as shown in the *Report of Tape Creation*, is n, you must position over 3n - 2 tape marks (i.e., FSF 1 for the first dataset, FSF 4 for the second, etc.).

Step 2: Access the Disk

Access the disk that is to contain the installation files as disk A. The disk size must be at least 1500 4-KB blocks (for example, 10 cylinders on 3380-type disks or 12000 blocks FB-512).

Step 3: Attach a Tape Drive to Your Virtual Machine

Ask the system operator to attach a tape drive to your virtual machine at address X'181' and mount the Construct Spectrum installation tape.

Step 4: Position the Tape for the CMS Command

Position the tape by issuing the CMS command:

```
TAPE FSF fsfs
```

where:

`fsfs` is the number of tape marks and is calculated as described above

Step 5: Load Construct Spectrum under CMS

Load Construct Spectrum under CMS installation material by issuing the CMS command:

```
TAPE LOAD * * A
```

Step 6: Keep the Tape Drive Attached to Your Virtual Machine

Keep the tape drive attached to your virtual machine, as the tape is required during the installation procedure.

INSTALLING THE MAINFRAME COMPONENTS

This chapter describes how to install the mainframe components of the Construct Spectrum Administration subsystem and the Construct Spectrum SDK.

The following topics are covered:

Installing Construct Spectrum

This section describes how to install Construct Spectrum for the first time (product has never been installed before) or over an earlier version of the product (upgrading). Steps required for upgrading purposes have “Upgrade Only” in their titles.

➢ To install the Spectrum Administration subsystem:

Each step is described in detail in the following sections.

Step 1: Create Administration Subsystem Data Files

- Job I050, Step 1370

  To create the Spectrum Administration subsystem data files, load two files from the installation tape: one contains security-related data (secured data) and the other contains all other data (unsecured data).

  Because the data is contained in two files, you can cipher secured data without ciphering all Spectrum Administration subsystem data. When loaded, the files are empty. After the physical files are created, a Natural program populates the files. To dynamically access these files, use the following LFILE values:

  – LFILE 135 to access the secured data

  – LFILE 136 to access the unsecured data

  The following sections describe how to load secured and unsecured data.

Loading Secured Data

Loading this data differs, depending on whether you cipher the secured data. The following sections describe how to load secured data ciphered and unciphered.

Note: Minimum recommended sizes are: DSSIZE=50B, NISIZE=50B, and UISIZE=20B.

Ciphered

- Job I050, Step 1370 and 1371

  To cipher secured data, refer to the ADACMP sample compress job and ADALODC load job in the SPE*nnn*.JOBS dataset. Use the FILE135 member in the SPE*nnn*.SRCE partitioned dataset as input to an ADACMP job. You may have to modify the contents of FILE 135 to reflect your environment. You can then use the results of this process as input to an ADALOD job. To load this file, use the same file number and DBID values used for NTFILE 135 (see **Step 3: Create a New Reentrant Natural Nucleus (Batch)**, page 33).

Note: SMA (System Maintenance Aid) does not support the loading of secured and ciphered data under BS2000/OSD.

To load the ciphered and secured data file, refer to the ADALOD1 sample file load job in the SPE*nnn*.JOBS dataset (OS/390) or SPE*nnn*.LIBJ dataset (VSE/ESA).

Unciphered

- Job I050, Step 1372; SPE*nnn*.SYS1 dataset

  The Adabas ADALOD utility loads the Spectrum Administration subsystem data file. The SPE*nnn*.SYS1 dataset is an unloaded Adabas V7 file; use this file as input to the ADALOD utility. To load this file, use the same file number and DBID values used to define NTFILE 135 (see **Step 3: Create a New Reentrant Natural Nucleus (Batch)**, page 33).

  Set the following minimum sizes for the ADALOD utility:

  – MAXISN=20000
  – DSSIZE=5
  – NISIZE=300B
  – UISIZE=50B

  To load the secured data, refer to the ADALOD1 sample file load job in the SPE*nnn*.JOBS dataset (OS/390) or SPE*nnn*.LIBJ dataset (VSE/ESA).

Loading Unsecured Data

- Job I050, Step 1373; SPE*nnn*.SYS2 dataset

  The Adabas ADALOD utility loads the Spectrum Administration subsystem data file. The SPE*nnn*.SYS2 dataset is an unloaded Adabas V7 file; use this file as input to the ADALOD utility. To load this file, use the same file number and DBID values used to define NTFILE 136 (see **Step 3: Create a New Reentrant Natural Nucleus (Batch)**, page 33).

  Note: Minimum recommended sizes are DSSIZE=200B, NISIZE=100B, and UISIZE=40B.

  To load the unsecured data, refer to the ADALOD2 sample file load job in the SPE*nnn*.JOBS dataset (OS/390) or SPE*nnn*.LIBJ dataset (VSE/ESA).

Step 2: Create Backup of SYSSPEC (Upgrade Only)

- Job I051, Step 1374

  Before upgrading, use the SYSMAIN utility to move all existing modules in the SYSSPEC library to a temporary library (SPETEMP) and define this library to Natural Security. Moving these modules ensures that no obsolete modules remain in your SYSSPEC library. Modules you created or modified using earlier versions of Construct Spectrum are not overwritten. Use the backup copy to restore your custom modules.

  Because the SYSSPEC library contains a large number of modules, move these modules in batch mode. Use the following batch input:

```
LOGON SYSTEM
SYSMAIN
MENU
M,ALL,*,FM,SYSSPEC,DBID,xxx,FNR,yyy,TO,SPETEMP,DBID,aaa,%
FNR,bbb,REP
FIN
```

  where:

  – *xxx* indicates the database ID (DBID) for your FNAT system file
  – *yyy* indicates the file number (FNR) for your FNAT system file
  – *aaa* indicates the DBID for your FUSER system file
  – *bbb* indicates the FNR for your FUSER system file

Step 3: Create a New Reentrant Natural Nucleus (Batch)

- Job I060

➢ To create a new reentrant Natural nucleus for batch:

- ❑ **Step 3a: Update Your Parameter Module**, page 33
- ❑ **Step 3b: Link with the SPENUC Module**, page 34
- ❑ **Step 3c: Make the Nucleus Reentrant**, page 35

The following sections describe each step in detail.

Note: If you intend to use the Trace function, you must install Construct Spectrum with printer 2 and 3 assigned to batch.

Step 3a: Update Your Parameter Module

The Spectrum Administration subsystem uses special files that must be identified to the Natural transaction used for the subsystem. You can either use the LFILE parameter to dynamically identify the files or you can code the NTFILE macro in the Natural parameter module to make the files part of the Natural nucleus.

➢ To update your parameter module (NATPARM):

1 Set ADAPRM=ON in your NATPARM to define a reentrant batch nucleus.

2 Set LFILE=(135,DBID,FNR) for secured data file to invoke Natural.

3 Set LFILE=(136,DBID,FNR) for unsecured data file to invoke Natural.
The DBID and FNR values identify the database and file number for the Spectrum Administration subsystem file.

4 This step differs, depending on whether you are an OS/390 or VSE/ESA user. For details on how to create the module, refer to your Natural Installation and Operations documentation.

Note: The content of the NATPARM module differs slightly, depending on your operating system.

Note: Construct Spectrum uses the Software AG editor. To access this editor, you must have an editor work file and buffer pool or you must specify an EDPSIZE.

The following example shows the recommended settings for the Spectrum Administration subsystem. The Natural parameters for your nuclei are indicated in bold:

```
ACMPARM  TITLE 'NATURAL 3.1 PARM-MODUL, EXAMPLE'
NTPRM FNR=XX,                  NATURAL SYSTEM FILE NUMBER     -
      DBID=XXX,                NATURAL SYSTEM FILE DB         -
      FUSER=(XXX,X),           NATURAL USER SYSTEM FILE DB    -
      FDIC=(XXX,XXX),           PREDICT SYSTEM FILE           -
      FNAT=(XX,XX),            FNAT FILE                      -
      FSEC=(XXX,XXX),           FSEC FILE                     -
      MENU=OFF,                MENU MODE OFF                  -
      IM=D,                                                   -
      INTENS=1,                                               -
      MT=0,                                                   -
      PD=50,                    SIZE OF COMPLETE PAGE DATA SET -
      ML=B,                    MESSAGE LINE ON BOTTOM         -
      FS=OFF,                                                 -
      LS=132,                  LINE SIZE (0 WOULD TAKE DEVICE)-
      PS=60,                    PAGE SIZE (0 WOULD TAKE DEVICE)-
      PC=OFF,                                                 -
      WH=OFF,                  WAIT IF RECORDS HELD           -
      USIZE=32,                SIZE OF USER AREA              -
      DATSIZE=180,              SIZE OF USER AREA             -
      ESIZE=120,                SIZE OF EXTENDED USER AREA
      ADAPRM=ON                 PASS SESSION DATA IN 7TH PARM  -
      FSIZE=40,                                              -
      SYNERR=ON,                                              -
      MAXCL=0,                                                -
      MADIO=0,                                                -
      DU=OFF,                    DUMP WILL BE PRODUCED        -
      OPRB=NOOPEN,               NO OPEN WILL BE DONE         -
      AUTO=ON,
    NTFILE ID=227,DBID=XXX,FNR=XXX  CONSTRUCT DATA
    NTFILE ID=135,DBID=XXX,FNR=XXX   SPECTRUM SECURED DATA
    NTFILE ID=136,DBID=XXX,FNR=XXX   SPECTRUM UNSECURED DATA
    NTSYS PC,'PRINTER=(PC,PC,,,PC),WORK=(PC,PC,,,PC)'
    END
```

Note: We recommend using a global buffer pool. If you use a local buffer pool, changes to code are not automatically detected; new or updated modules are not updated. If you are using a local buffer pool, stop and then restart all running services to update modules.

Step 3b: Link with the SPENUC Module

The SPENUC module is shipped with Natural V3.1.6. The instructions to do this vary from operating system to operating system. For OS/390, you can use:

```
INCLUDE NATLIB(SPENUC)
```

Step 3c: Make the Nucleus Reentrant

➢ To make the nucleus reentrant:

1 Link the new batch nucleus with a reentrant version of the Adabas link routine. Because you cannot make ADAUSER reentrant, you must replace it with one of the following:

– Link the nucleus using the reentrant version of the link routine, ADALNKR, which is supplied with Adabas

or

– Modify your existing ADALNK to be reentrant and then link the nucleus using the modified ADALNK

In either case, set the default SVCNR value in the ADALNK source to the Adabas SVC number used in your environment. In the multi-tasking batch nucleus, you cannot change ADARUN parameters dynamically because the DDCARD input parameters are no longer available.

Note: For OS/390 users, ensure that the RENT link option is specified.

The following section describes how to make the ADALNK routine reentrant.

Modifying the ADALNK Routine

- Job I055, Step 1370

➢ To make the ADALNK routine reentrant:

1 Set the &RENT macro value to 1.
For example, comment out the default setting for &RENT and remove the comment marker from the reentrant setting:

```
* &RENT     SETB  0          Non-reentrant ADALNK                .sg62.
 &RENT     SETB  1          Reentrant ADALNK                    .sg62.
```

2 Assemble the modified ADALNK.

3 If running under OS/390, link the modified ADALNK.
Ensure the RENT link option is specified.

Step 4: Load Administration Subsystem Components

- Job I061, Step 1370; SPE*nnn*.INPL dataset

  This dataset contains modules for the Spectrum Administration subsystem. The modules are stored in the SYSSPEC, SYSLIBS, and SYSTEM libraries in the FNAT system file. Ensure that the FNAT parameter value correctly identifies the desired system file. Use the following input to the INPL utility:

```
INPL
B
FIN
```

Note: Assign SPE*nnn*.INPL to CMWKF01.

Step 5: Load Administration Subsystem Error Messages

- Job I061, Step 1371; SPE*nnn*.ERRN dataset

  This dataset contains error messages used by Construct Spectrum. The dataset was created using the ERRULDUS SYSERR utility. All messages are loaded into SYSERR. Messages 0001 to 9999 are loaded into the SYSSPEC library; messages 8000 to 8999 are loaded into the CSTAPPL library.

  To load these messages into your system files, invoke Natural in batch with work file 2 assigned to SPE*nnn*.ERRN. Ensure that your FUSER and FNAT system files are specified correctly. Use the following statements:

```
LOGON SYSERR
ERRLODUS
FIN
```

  For more information, see the SYSERR utility in the Natural Utilities documentation.

Step 6: Load Dataset Containing Updates and Fixes

- Job I061, Step 1372; SPE*nnn*.IUPD dataset

  This INPL dataset contains updates and fixes to Construct Spectrum. Load this dataset after loading the SPE*nnn*.INPL dataset.

Step 7: Create and Link New Natural Nucleus (Online)

- Job I080

  Ensure that the updates described in **Step 3a: Update Your Parameter Module**, page 33, are applied to the NATPARM for your online nucleus.

Step 8: Run CVSPEVR Setup Utility

- Job I200, Step 1371

  Invoke the CVSPEVR setup utility in batch mode. It does not require parameters to run. This conversion utility makes different changes, depending on whether you are upgrading from an earlier version of Construct Spectrum or installing the product for the first time. The CVSPEVR utility does the following:

  – When upgrading, converts the data in your SPE43 or SPE44 data files to SPE45 format. This is necessary because the data fields used to hold DBID and FNR values increased from three to five digits.

  – Sets the system file version to SPE45.

  – Invokes the CVUSRCOP utility to copy the USR modules used by Construct Spectrum from the SYSEXT library to the SYSSPEC library.

Note: If this utility returns a NAT4890 or NAT4891 error, modify the Natural Security definitions for the affected libraries and set the Utilities flag to “N”. To complete the copy procedure, rerun the CVUSRCOP utility.

Note: If you use the Natural Security Administration option to define all Natural system libraries, ensure that the SYSLIB library is defined.

Step 9: (Conditional) Create Natural Security Definitions

If you are installing for the first time and will be using Natural Security, you must add the Natural Security definitions for the SYSSPEC library, as well as the Spectrum Administration subsystem files. The SYSSPEC library stores the executable code for the Administration subsystem. You can restrict access to this library to only those users who maintain definitions that control the generation process. Users who generate modules using the Construct Spectrum SDK do not require access to this library. Ensure that you have defined SYSLIBS to Natural Security.

Defining Libraries to Natural Security

If you are installing Construct Spectrum for the first time (not upgrading to a new version) and you are using Natural Security, you must add definitions for the following Spectrum Administration subsystem library to Natural Security:

Library	Description
SPECDEMO	Construct Spectrum demo library.
SYSSPEC	Spectrum Administration subsystem library.

Step 10: Load Administration Subsystem Help Text

- Job I500, Step 1370; SPE*nnn*.SYSH dataset

  This dataset contains the help text for the Spectrum Administration subsystem. Using a Natural job, load the help text to the Natural Construct system file.

➢ To load help text:

- Invoke Natural in batch with work file 1 assigned to SPE*nnn*.SYSH.
  Use the following statements:

```
LOGON SYSCST
CSHLOAD
*,*,*,*,Y
.
FIN
```

Note: Ensure LFILE 227 points to the Natural Construct system file.

Step 11: Create a New Natural Profile

To simplify and automate the launching of the Construct Spectrum environment, use the Natural SYSPARM utility to create a new profile.

➢ To create a new Natural profile:

1 Log onto the SYSPARM library.

2 Issue the MENU command.

3 Type “A” in conjunction with the SYSSPEC profile name.

4 Add the parameters to start Natural with the required sizes and system files.

Note: If suitable values are already linked to your Natural nucleus, some of these parameters may not be necessary.

If not defaulted in the Natural transaction, the following parameters are required:

Parameter	Description
ESIZE=120	Extended user area.
LFILE=(227,DBID,FNR)	Construct Spectrum system file.
LFILE=(135,DBID,FNR)	Construct Spectrum secured file.
LFILE=(136,DBID,FNR)	Construct Spectrum unsecured file.

➢ To allow Construct Spectrum to communicate with Natural Security:

1 Access the Natural Security main menu.

2 Invoke the Administration Services main menu.

3 Invoke the General Options menu.

4 Set the Free access to functions via interface subprograms property to “Y”.

Dataset Summary

The following table identifies the Construct Spectrum dataset, job, and step names:

Dataset Name	Job Name	Step Name
SPE*nnn*.ERRN	I061	1371
SPE*nnn*.INPL	I061	1370
SPE*nnn*.IUPD	I061	1372
SPE*nnn*.LOAD	I055	1370
SPE*nnn*.SYS1	I050	1372
SPE*nnn*.SYS2	I050	1373
SPE*nnn*.SYSF	I050	1375
SPE*nnn*.SYSH	I500	1370

Activating the Spectrum Administration Subsystem

To use the Spectrum Administration subsystem, you must first activate the system. Perform the following series of updates and system-related functions to use the supplied demo application and samples.

➢ To activate the Spectrum Administration subsystem:

- ❑ **Step 1: Verify System File Assignments**, page 41
- ❑ **Step 2: Verify Natural Subtask Support**, page 41
- ❑ **Step 3: Load Default System File Data**, page 42
- ❑ **Step 4: Update Entire Broker Attribute File**, page 44
- ❑ **Step 5: Verify Entire Broker Attribute File**, page 44
- ❑ **Step 6: Verify USR* Subprogram Installation**, page 45
- ❑ **Step 7: Verify Software AG Editor Installation**, page 45
- ❑ **Step 8: Verify Message Queue API**, page 45
- ❑ **Step 9: Define Batch Transaction**, page 46
- ❑ **Step 10: Launch the Attach Service**, page 48
- ❑ **Step 11: Launch Remaining Servers**, page 48
- ❑ **Step 12: (Conditional) Define JCL for the Construct Windows Interface**, page 49

The following sections describe each step in detail.

Step 1: Verify System File Assignments

This step ensures that the profile was created correctly.

➢ To verify the system file assignments:

1 Invoke Natural using the new SYSSPEC profile.

2 Log onto the SYSSPEC library.

3 Issue the VERIFY command.

4 Enter "LF" to verify logical files.
The following output is displayed:

```
Construct System File (LFILE 227) checked successfully
Spectrum Secured File (LFILE 136) checked successfully
Spectrum Unsecured File (LFILE 135) checked successfully
FNAT System File checked successfully
FUSER System File checked successfully
FDIC System File checked successfully
```

If any file fails to verify:

– Correct the SYSSPEC profile

– Restart your Natural session

– Reissue the VERIFY command

Step 2: Verify Natural Subtask Support

If your operating system supports multiple Natural batch sessions in one address space (for example, OS/390), use the Multi-Tasking Verification utility to verify that your environment is configured correctly. Then test the Construct Spectrum services to ensure they are operating correctly.

Using the Multi-Tasking Verification Utility

The TESTTASK utility verifies that your batch Natural nucleus and ADALNK are reentrant. To run Construct Spectrum services in an environment that supports multiple Natural batch sessions in one address space, both conditions are required.

Before using the TESTTASK utility, ensure the following:

- The Natural batch nucleus includes the ADALNKR module or modified ADALNK module. For more information, see **Step 3: Create a New Reentrant Natural Nucleus (Batch)**, page 33.
- The ADALNKR or modified ADALNK module is updated to the correct SVC.
- The batch nucleus specifies ADAPRM=ON.
- The INCLUDE statement for ADAUSER is removed.

To start multiple Natural tasks, define the TESTSTSK module as a subtask started by TESTTASK. If your batch nucleus or ADALNK is not reentrant, the job that runs TESTTASK will not end. Otherwise, tracing is written to the job output showing the execution status of the subtasks.

The following JCL excerpt shows the parameters required to call TESTTASK:

```
SYSSPEC,userid,pswd
GLOBALS IM=D ID=/ IA=:
TESTTASK
*/ETID=12301,STACK=(LOGON SYSSPEC,userid,pswd;TESTSTSK 10)
*/ETID=12302,STACK=(LOGON SYSSPEC,userid,pswd;TESTSTSK 10)
*/ETID=12303,STACK=(LOGON SYSSPEC,userid,pswd;TESTSTSK 10)
*/ETID=12304,STACK=(LOGON SYSSPEC,userid,pswd;TESTSTSK 10)
*/ETID=12305,STACK=(LOGON SYSSPEC,userid,pswd;TESTSTSK 10)
.
FIN
/*
```

The job must also define work file 1. This work file can be routed to a printer device.

Step 3: Load Default System File Data

Regardless of whether you are installing for the first time or over an existing version, you must perform this step to populate the Spectrum files with data required by version 4.5. This procedure clears the source area, loads the current Spectrum files, and generates entries required for the Broker attribute file. You must copy the entries manually.

➢ To load the required data:

1 Log onto the SYSSPEC library.

2 Invoke the SPIDATA program.
The following panel is displayed:

```
Enter default values to be used to establish service records...
  Broker ID ........ BKRnnn_____________________________
  Service qualifiers Prefix: ____ Suffix: ____
  Server Class ..... SPECTRUM_____________________
  JCL Text Member .. BATCHTXT
  Transaction ...... NATBAT___
  Subtask Support .. Y
  Profile FNAT DBID  ____19
  Profile FNAT FNR . ____30
  Profile .......... SYSSPEC_

Natural Security Settings...
  Servers under NSC  _
  User id .......... ________
  Password ......... ________
Mark default records to be loaded ...
  X Users             X Groups            X Domains            X Steplibs
  X Spectrum Service  X Appl Service      X Security Links
```

SPIDATA Program Panel

Use this panel to specify default settings for the records to be generated. You can use the default values for most settings. Specify the following fields:

Field	Description
Broker ID	Specify the name of the broker to use in this environment.
Note:	If you specified an incorrect broker ID, access the Spectrum Administration subsystem and specify the correct broker ID.
Service Qualifiers	Use the Prefix and Suffix fields as a basis for creating the JCL text member (BATCHTXT). The combination of prefix and suffix values must be less than or equal to 10.
Transaction	Name of the Natural nucleus under which the service will run. The default transaction name is NATBAT, but you can change the name if desired.
Subtask Support	If the TESTTASK program completed successfully, “Y” is displayed. If not, “N” is displayed. For more information, see **Step 2: Verify Natural Subtask Support**, page 41.
Profile DBID and FNR	Specify the database ID and file number for the Natural FNAT system file in which the SYSSPEC profile is located.
Profile	Specify the name of the Profile. By default, SYSSPEC is displayed.
Natural Security Settings	If your servers run under Natural Security, mark Servers under NSC and specify a user ID and password; use the specified user ID and password to start all servers.

You can also run this utility again to create new Construct Spectrum services for other environments. In that case, add a prefix or suffix to the service names and specify an alternate Server Class.

Executing the SPIDATA program displays all records that are being loaded. If any of the records already exist in your Construct Spectrum files, they are not replaced. If you are running the SPIDATA program for the first time, the output report indicates the records that were not replaced. Rename or delete the existing records and rerun the SPIDATA program, specifying only the objects you want to load.

Step 4: Update Entire Broker Attribute File

When the SPIDATA program ends, the Natural source area contains the definitions required for the Entire Broker attribute file. Copy these definitions from the source area to your Broker attribute file and confirm the following global settings:

```
*--------------------------------------------------------------------*
* Broker specific Attributes / Definition of global resources       *
*--------------------------------------------------------------------*
 DEFAULTS = BROKER
   NUM-CLIENT        = 250
   NUM-CONVERSATION  = 1000
   NUM-SERVER        = 50
   NUM-SERVICE       = 500
   NUM-LONG-BUFFER   = 500
   NUM-SHORT-BUFFER  = 2000
```

Step 5: Verify Entire Broker Attribute File

Use the VERIFY program to verify the additions to the Entire Broker attribute file.

➢ To verify the Broker attribute file additions:

1 Log onto the SYSSPEC library.

2 Invoke the VERIFY program.

3 Enter “AF” to verify the attribute file additions.
A confirmation panel is displayed:

```
Spectrum service                      Broker service
------------------------ ------------------------------------------------
ATTACH                   BKR057/SPECTRUM-QA/ATTACH/MAIN
                         MAIN and CMD services registered successfully
CFACTORY                 BKR057/SPECTRUM-QA/CFACTORY/MAIN
                         MAIN and CMD services registered successfully
DISPATCH                 BKR057/SPECTRUM-QA/DISPATCH/MAIN
                         MAIN and CMD services registered successfully
SECURITY                 BKR057/SPECTRUM-QA/Security/MAIN
                         MAIN and CMD services registered successfully
TIMESTAMP                BKR057/SPECTRUM-QA/TIMESTAMP/MAIN
                         MAIN and CMD services registered successfully
```

Broker Attribute File Confirmation Panel

If any errors appear in the output, correct either the records in your Spectrum file or the definitions in your Broker attribute file and rerun the test.

Step 6: Verify USR* Subprogram Installation

Use the VERIFY program to verify that all required USR modules are available from within the current steplib chain.

➢ To verify that all required USR modules are available:

1 Enter “US” from the VERIFY program.
The program calls the USR routine to confirm its availability.

Step 7: Verify Software AG Editor Installation

Use the VERIFY program to:

- Open a Software AG editor session
- Write lines to the Software AG editor
- Read the lines back from the Software AG editor
- Close the Software AG editor session
- Write out a success/fail message

➢ To verify the installation of the Software AG editor:

1 Enter “SE” from the VERIFY program.

Step 8: Verify Message Queue API

Use the VERIFY program to verify the message queue API.

➢ To verify the message queue API:

- Enter “MQ” from the VERIFY program.
The program:
  - Calls the message queue (conversation factory) APIs to pass data (as a multi-part message). This confirms that no limits are specified on broker message lengths that will cause SQUSEND/SQURECV to fail.
  - Sends the binary values from H'00' to H'FF'. This confirms that no translation routine was added to the Broker attribute file.
  - Confirms that the data it receives matches the data it sent.

Step 9: Define Batch Transaction

In this step, create a new JCL template (BATCHTXT) you can use to launch your servers. Sample templates are supplied in the SYSSPEC library. Edit the following member for your server environment:

- For OS/390, edit the BATCHJCL member.
- For VSE/ESA, edit the BATCHDCL member.
- For BS2000/OSD, edit the BATCHBCL member.
- For other environments, create the BATCHTXT member starting with a valid Natural batch job applicable to your operating system.

Specifying a Job Name

The job name can either be a specific value or a combination of the &JOB-PREFIX&JOB-NR substitution parameters (derives a unique job name). When the JCL is generated, the &JOB-PREFIX value is assigned a two-character value associated with the server it is invoking.

Logon Parameters

If your servers run under Natural Security, supply a user ID and password as part of the LOGON SYSSPEC command. You cannot use the job name to define the user ID because the value is normally generated dynamically. Include AUTO=OFF in your NATPARM.

Under Natural Security, the LOGON command should appear as follows:

```
SYSSPEC user-ID,password
```

where user ID is a valid user linked to the SYSSPEC library.

Note: Under OS/390, you can also specify the USERID=YES parameter in the NATOS module and supply a USERID parameter on your job card. In that case, the USERID parameter on the job card defines the Natural Security user, not the job name.

Natural Input Parameters

Following the LOGON, the Natural input statements should appear as follows:

```
SPSSTART
&SPECTRUM-SERVICE,%
&USER-ID,%
&PASSWORD,%
&TRACE-OPTION,%
&TRACE-LOCATION,%
&Q-BROKER-ID,%
&Q-USER-ID,%
&Q-TOKEN,%
&Q-Security-TOKEN,%
&Q-CONV-ID
&PROGPARM
FIN
```

Work File 7

The JCL member should define work file 7 (CMWKF07). If you are using Natural's subtasking feature, define work file 7 as a temporary file. If you are invoking all servers as separate batch jobs, define work file as a permanent file.

Save your modified JCL member as BATCHTXT.

Test Job Submission

➢ To test the submitted job:

1 Invoke the BATCHTST program to test the generated JCL.

2 Override any values to reflect your environment.

3 Press Enter to generate the JCL into the source area.

4 Review the JCL for validity.

The Natural input statements should now contain the following:

```
VERIFY
*
.
SPSWKF07
```

If necessary, modify the original BATCHTXT member and repeat the test. Once valid JCL is generated, rerun BATCHTST and mark the Submit option. This submits a job to run the verify steps in batch. Monitor and review the submitted job using normal operating system commands.

Step 10: Launch the Attach Service

Launch the attach service that allows you to issue commands to the server.

➢ To launch the attach service:

1 Log onto the SYSSPEC library.

2 Issue the "MENU SA MS" command.
The Manage Services panel is displayed.

3 Type "I" beside the ATTACH service

4 Press Enter to initiate the attach service.

Note the name of the batch job submitted. In a few seconds, you should be able to issue other commands, such as PING (P) or ENVIRONMENT (EV). If the "ETB Error 7/7 (Service not registered)" message is displayed, review the job, resolve any errors in BATCHTXT, and repeat the process.

Step 11: Launch Remaining Servers

With an attach service running, use the INITIATE command to launch the Timestamp service. In a few seconds, you should be able to ping this service. If not, perform one of the following steps:

- If you are not using Natural's subtasking feature, review the JCL that was submitted and correct BATCHTXT.
- If you are using Natural's subtasking feature, enter "D" (Debug command) beside the Timestamp server. A report is displayed, indicating the outcome. For example:

```
==================================ATTACH============================
BKR057/SPECTRUM-QA/ATTACH/MAIN/B0FC1B6797BFAD01B0FC2313E9356601
Response: 1              Response code: 0000          Message ID:
Natural startup parameters ...
FNAT=(1000,1000),PROFILE=SYSSPEC, STACK=(LOGON SYSSPEC;SPSSTART
USING_CMPARM
;SPSDATA) ETID=E1834186
Response: 2              Response code: 0000          Message ID:
Data passed via CMUPARM ...
Service=TIMESTAMP,Init User=,Parent
Rid=B0FC1B6797BFAD01B0FC2313E9356601
Response: 3              Response code: 0000          Message ID:
Natural startup results ...
SPSSTART started in debug mode, for service TIMESTAMP
Checking system files ...
System files validated
Logon performed
Register performed
Server program: SPSTIMS    *DATA:   -1
Program SPSDATA invoked.    *DATA =    0
Stopping test due to debug mode
```

Review this report and try to diagnose the startup problem. Modify the Timestamp service records (using the MENU SA MM SE command), as well as the records for all other services that use the SUBTASKB service start routine. Repeat the procedure until you are able to initiate and ping all servers.

For more information, see *Construct Spectrum Administration.*

Step 12: (Conditional) Define JCL for the Construct Windows Interface

If you are using the Construct Windows interface (CWI), you must define an additional JCL member to support Natural commands issued from the client. This text member is used by the CONSTRUCT-COMMAND Spectrum service. For a sample of the required JCL, refer to the BATCHCMD module in the SYSSPEC library. This JCL should be similar to the JCL you created for your attach servers. The only difference is the addition of the steps described below, performed immediately prior to the procedure described in **Step 9: Define Batch Transaction**, page 46.

➢ Before performing the procedure:

1 Enter the following Natural input statements:

```
LOGON &LIBRARY
CSGCMD1
&USER-ID,%
&PASSWORD,%
&Q-BROKER-ID,%
&Q-USER-ID,%
&Q-TOKEN,%
&Q-Security-TOKEN,%
&Q-CONV-ID
&Natural-COMMAND
FIN
```

This directs the Natural output (CMPRINT) to a temporary work file. If you are using Natural Security, you must also change the LOGON statement to include user ID and password place holders. For example:

```
&LIBRARY,&USER-ID,&PASSWORD
```

2 Read the output from Step 1.

3 Send the output to the Construct client.
Include the following statements:

```
LOGON &LIBRARY
SPSSTART
&SPECTRUM-SERVICE,%
&USER-ID,%
&PASSWORD,%
&TRACE-OPTION,%
&TRACE-LOCATION,%
&Q-BROKER-ID,%
&Q-USER-ID,%
&Q-TOKEN,%
&Q-Security-TOKEN,%
&Q-CONV-ID
FIN
```

Adjust the logon if necessary, as described in Step 1.

4 Define work file 7 as the same dataset created by CMPRINT in Step 1.

Installing the SDK Over an Existing Version

This section describes how to install Construct Spectrum SDK over an existing version.

➢ To install Construct Spectrum SDK over an existing version:

- **Step 1: Create Backup of SDK Modules in SYSCST**, page 52
- **Step 2: Load Natural Components**, page 53
- **Step 3: Load Natural Construct Models**, page 53
- **Step 4: Load Code Frames for Natural Construct Models**, page 54

Each step is described in detail in the following sections.

Step 1: Create Backup of SDK Modules in SYSCST

- Job I051, Step 1361

  If you modified any of the Construct Spectrum models in the SYSCST library, use the SYSMAIN utility to move the custom modules to a temporary library (SPVTEMP) and define this library to Natural Security. This ensures that your custom modules are not overwritten. Use the backup copy to restore your modules. Ensure that you have defined SPVTEMP to Natural Security.

  Use the following batch input to back up the modules indicated:

```
LOGON SYSTEM
SYSMAIN
MENU
M,ALL,CSVB*,FM,SYSCST,DBID,xxx,FNR,yyy,TO,SPVTEMP,DBID,%
xxx,FNR,yyy,REP
MENU
M,ALL,CSVP*,FM,SYSCST,DBID,xxx,FNR,yyy,TO,SPVTEMP,DBID,%
xxx,FNR,yyy,REP
MENU
M,ALL,CSVU*,FM,SYSCST,DBID,xxx,FNR,yyy,TO,SPVTEMP,DBID,%
xxx,FNR,yyy,REP
MENU
M,ALL,CUMD*,FM,SYSCST,DBID,xxx,FNR,yyy,TO,SPVTEMP,DBID,%
xxx,FNR,yyy,REP
MENU
M,ALL,CUSP*,FM,SYSCST,DBID,xxx,FNR,yyy,TO,SPVTEMP,DBID,%
xxx,FNR,yyy,REP
MENU
M,ALL,CUSS*,FM,SYSCST,DBID,xxx,FNR,yyy,TO,SPVTEMP,DBID,%
xxx,FNR,yyy,REP
MENU
M,ALL,CUVB*,FM,SYSCST,DBID,xxx,FNR,yyy,TO,SPVTEMP,DBID,%
xxx,FNR,yyy,REP
MENU
M,ALL,CUVL*,FM,SYSCST,DBID,xxx,FNR,yyy,TO,SPVTEMP,DBID,%
xxx,FNR,yyy,REP
MENU
M,ALL,CUXC*,FM,SYSCST,DBID,xxx,FNR,yyy,TO,SPVTEMP,DBID,%
xxx,FNR,yyy,REP
FNR,bbb,REP
FIN
```

  where:

- *xxx* indicates the database ID (DBID) for your FNAT system file
- *yyy* indicates the file number (FNR) for your FNAT system file
- *aaa* indicates the DBID for your FUSER system file
- *bbb* indicates the FNR for your FUSER system file

Step 2: Load Natural Components

- Job I061, Step 1361; SPV*nnn*.INPL dataset

  This dataset contains the Natural modules used by the Construct Spectrum SDK models and the demo application. Use the Natural INPL utility to load these modules into your development environment. The FUSER and FNAT parameters must correspond to system files that contain an existing version of Natural Construct V4.5 or later.

  Note: SPV*nnn*.INPL must be assigned to CMWKF01.

  Use the following input to the INPL utility:

```
INPL
B,Y
FIN
```

Step 3: Load Natural Construct Models

Note: All Natural Construct load utilities write reports to Printer 1. Ensure that there is a CMPRT01 definition in the JCL used for these functions.

- Job I500, Step 1361; SPV*nnn*.SYSM dataset

  This dataset contains the Natural Construct model definitions. Use a Natural job to load the Natural Construct model definitions from the Construct Spectrum SDK installation tape.

  To load these model definitions to your Natural Construct file, invoke Natural in batch with work file 1 assigned to SPV*nnn*.SYSM. Use the following input statements:

```
LOGON SYSCST
CSMLOAD
*,Y
.
FIN
```

Note: Ensure LFILE 227 for the job points to the Natural Construct system file.

Step 4: Load Code Frames for Natural Construct Models

- Job I500, Step 1362; SPV*nnn*.SYSR dataset

  This dataset contains the code frames for the Natural Construct models. Use a Natural job similar to the one you used to load SPV*nnn*.SYSM and load the code frames from the installation tape to the same Natural Construct system file.

  To load the model code frames, invoke Natural in batch with work file 1 assigned to SPV*nnn*.SYSR. Use the following input statements:

```
LOGON SYSCST
CSFLOAD
*,Y
.
FIN
```

Installing the SDK for the First Time

This section describes how to install Construct Spectrum SDK for the first time (product has never been installed before).

➢ To install Construct Spectrum SDK for the first time:

- **Step 1: Load Natural Components**, page 56
- **Step 2: Load Definitions for Natural Construct Models**, page 56
- **Step 3: Load Code Frames for Natural Construct Models**, page 57
- **Step 4: (Optional) Create Security Definitions for Demo Application**, page 57
- **Step 5: Confirm NATPARM Assignments**, page 57

Each step is described in detail in the following sections.

Step 1: Load Natural Components

- Job I061, Step 1361; SPV*nnn*.INPL dataset

  This dataset contains Natural modules used by the Construct Spectrum SDK models and the demo application. Use the Natural INPL utility to load these modules into your development environment. The FUSER and FNAT parameters must correspond to system files that contain an existing version of Natural Construct V4.5 or later.

  Note: SPV*nnn*.INPL must be assigned to CMWKF01.

  Use the following input to the INPL utility:

```
INPL
B,Y
FIN
```

Step 2: Load Definitions for Natural Construct Models

Note: All Natural Construct load utilities write reports to Printer 1. Ensure that there is a CMPRT01 definition in the JCL used for these functions.

- Job I500, Step 1361; SPV*nnn*.SYSM dataset

  This dataset contains the Natural Construct model definitions. Use a Natural job to load the model definitions from the Construct Spectrum SDK installation tape.

  To load these model definitions to your Natural Construct file, invoke Natural in batch with work file 1 assigned to SPV*nnn*.SYSM.

  Use the following input statements:

```
LOGON SYSCST
CSMLOAD
*,Y
.
FIN
```

Note: Ensure LFILE 227 for the job points to the Natural Construct system file.

Step 3: Load Code Frames for Natural Construct Models

- Job I500, Step 1362; SPV*nnn*.SYSR dataset

  This dataset contains the code frames for the Natural Construct models. Using a Natural job similar to the one used to load SPV*nnn*.SYSM, load the code frames from the installation tape to the same Natural Construct system file.

  To load the model code frames, invoke Natural in batch with work file 1 assigned to SPV*nnn*.SYSR.

  Use the following input statements:

```
LOGON SYSCST
CSFLOAD
*,Y
.
FIN
```

Step 4: (Optional) Create Security Definitions for Demo Application

The installation procedure installs a demo application in the SPECDEMO FUSER library. If you are using Natural Security, create security definitions for this library. Define SPECDEMO as a public library.

Step 5: Confirm NATPARM Assignments

For optimal use of Construct Spectrum SDK models, use the following NATPARM settings:

- ESIZE=120
- SYNERR=ON

Dataset Summary

The following table identifies the Construct Spectrum dataset, job, and step names:

Dataset Name	Job Name	Step Name
SPV*nnn*.INPL	I061	1361
SPV*nnn*.SYSM	I500	1361
SPV*nnn*.SYSR	I500	1362