

A decorative graphic consisting of a series of horizontal lines of varying lengths, stacked vertically. The lines are white on a black background.

Océ

PRISMAproduction/MVS V3.8

A solid black horizontal bar.

Installation Guide



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Preface

This document explains how to install, maintain, and report problems in Smart Print Services (SPS) for all MVS based operating systems. In general these functions can be performed without any detailed knowledge of SPS or its parameters. The intended audience for this document is anyone responsible for these functions in an installation.

Version 3.8 of SPS/MVS includes support for the SPS base product, the LINE and APA drivers. The LINE driver includes support for LIP (line image processor) printers and the SPSSSORT dummy printer (SPS Page Sort). The APA driver includes support for single and twin all points addressable printers. *The SPS/MVS-APA or SPS/MVS-LIP Administrator's Guide Version 3.8* should be consulted for SPS parameter information for the respective printer types.

Use this manual to install SPS/MVS version 3.8, and all subsequent releases, until the manuals are superseded.

Summary of Amendments

Summary of Amendments

Summary of Amendments
for U20944-J-Z247-5-7600
for SPS/MVS Version 3.8

- Support for JCL OUTPUT statement parameters, COLORMAP, OFFSETXF, OFFSETYF, OFFSETXB, OFFSETYB, OVERLAYF, OVERLAYB, DUPLEX, INTRAY, OUTBIN
- New DD statement for Object Container library OBJCONDD
- New parameter in SETUPxxx member, COLORMAP(colormap-name) to be used as the default colormap for the printer session
- New parameters in USER/FORMS control file, PRESENTATION(PORTRAIT180) and (LANDSCAPE180)
- SETUP verification support from formdef for color ids introduced
- UPGRADED color support triplets in PTOCA, IOCA, GOCA & BCOCA resources
- JPEG IOCA's supported
- MULTI-LEVEL IOCA support
- Relative line positioning support in PAGEDEF
- Triplet x'27' support for rotation of page segments and other OCA objects in write test command
- Incorporation of 3.6 PTF's with 3.6 base level forming the 3.8 base level

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1 SPS/MVS System Overview

SPS/MVS is the printer subsystem that drives single and twin printers supporting APA and LINE data streams under MVS/SP2 (XA), MVS/SP3/SP4/SP5 (ESA) and OS/390. SPS/MVS, as distributed, may include either an APA driver, a LINE driver or both. The SPS APA driver accepts SPS data stream (SPDS, a fully compatible PSF data stream) and line input. SPS APA converts these input types (may be intermixed) to an SNI intelligent printer data stream (SNIPDS, a data stream fully compatible with the IPDS data stream). The SPS LINE driver accepts line input and converts it to line image processor (LIP) or enhanced printing mode (MOD2) data streams. Optionally, special text characters that control advanced functions may be embedded in the print data streams. SPS supports network attached APA printers via TCP/IP and VTAM/LU1. PRISMA+APA, PSF/2, PSF/6000 can be connected using VTAM/LU6.2. The SPS base component may also be used with the SPS PSORT to make it easier to use fan-fold duplex printers without post-processing machines (see manual "The PSORT User Guide U26433-J-Z247-1-7600).

1.1 SPS Processing Overview

SPS accepts both JES spool and direct printing application print data streams and converts them to a form acceptable to the printer being driven. JES spooled output is standard output directed to the JES spooling system. Direct printing output is output from an application that has allocated a printer on-line and is printing directly to the device using data management. JES spooled output processing is available for all SPS supported printer models. Direct print processing is available on the APA single and twin models¹.

SPS uses only standard documented interfaces. No modifications are introduced in the MVS or JES environments. SPS uses the Functional Subsystem Interface (FSI) to communicate with the Job Entry subsystem (JES) installed in the host MVS system. SPS

¹ Direct printing is technically possible on the line driver supporting LIP and MOD2 printers. Customers interested in using direct printing on the line driver should contact their Océ service representative for more information.

uses the Subsystem Interface (SSI) to communicate with data management routines in the direct printing environment.

1.1.1 FSI Interface

The FSI is an IBM supported customer interface, permitting an address space to communicate with the spooling and operator facilities of the installed JES. The FSI supports functions such as connecting and disconnecting FSS's and FSA's to JES (establishing and terminating communication), opening and closing spool output files, reading spool records, receiving operator or JES initiated orders, receiving posts from JES and sending responses to JES.

SPS is defined to JES in the JES initialization parameters at installation time as one, or more, functional subsystems (FSSs), each with one or more functional subsystem applications (FSAs) that are printer drivers. These FSAs run as subtasks of the FSS they are associated with. One FSS and its active FSAs resides in one address space. Multiple executions of APA and LINE printer drivers may run concurrently under the same address space, or in several address spaces within the system.

When the operator issues a start printer to any SPS controlled device, an address space is created and the FSS is loaded into the address space and initialized, if the FSS for this printer has not been started. After the address space is created, an FSA is associated with the printer and attached as a subtask. If the FSS for the printer already exists in an address space, only the FSA subtask attach occurs. The FSA subtask initializes and loads the appropriate printer driver and requests a spool file from JES. Spool files are processed until the printer is drained, at which time the FSA controlling the printer is detached. Other FSAs driving different printers continue to process. When the operator starts PRTn again, a new copy of the FSA is attached and initialized, and the process continues as before.

A spool print file is processed by merging the control file data with the user JCL, loading the required resources and printing the file. The APA driver uses data management to read resources from their libraries and EXCPVR, with PCI interrupts, to pass the resources to the printer as an SNIPDS data stream. The LINE driver, when driving LIP printers, uses EXCPVR, with PCI interrupts, to transmit special control sequences that request the loading of resources by the printer from diskettes or hard disk in the printer (alternately an operator intervention may be requested). The LINE driver, when driving MOD2 printers, loads resources from their libraries and uses EXCP to pass them to the printer. Both the APA and LINE drivers use the FSI interface to read user generated spool files and EXCPVR, with PCI, interrupts to pass the output data streams to the printer.

At completion of printing, a spool file is returned to the JES system, which either deletes or keeps the spool file depending on the operator or user request. If an error occurs during the processing of a spool file, in most cases the spool file is returned to JES with a request to save it on the spool. When the error is correctable (e.g., font not found) the file can be reprinted from the most recent checkpoint, or the beginning. When the error in a saved

spool file is not correctable, the operator or user must delete the file. All operator printer requests are processed by SPS. When a file is interrupted by the operator, it is checkpointed so that it may be restarted at a later time. A cancelled file will be purged.

1.1.2 SSI Interface

The SSI is an IBM supported customer interface enabling applications to establish communication and interface with system routines. The application becomes a defined subsystem of the operating system and receives control when specified services are requested.

During system initialization SPS is defined to the operating system as a subsystem, the service routines that SPS will need are loaded into the CSA and the SPS subsystem is made active. After initialization, control is passed to SPS during JCL conversion, allocation, deallocation, open, close and put or write.

SPS determines at JCL conversion if a valid request for SPS direct printing services has been made. An invalid request receives a JCL error. SPS performs no processing during allocation and deallocation. Instead control is immediately returned. At open, SPS attaches, allocates and builds the control blocks required for direct print processing. SPS also establishes a put routine interface by requesting ACB processing. If these actions are for the first printer, SPS also establishes a pseudo FSS/FSA environment. SPS receives control during put or write processing, processes the request and returns control to the user. At close SPS frees any control blocks used for direct printing, cleans up storage, and detaches. If SPS determines these actions are for the last SPS printer used by the address space, SPS also deletes the pseudo FSS/FSA environment.

1.2 Operating System Requirements

SPS Version 3.8 will run without restrictions on MVS systems at the release levels listed below. Any specifically required PTF's are documented by the ++IF REQ statements of the supplied installation deck.

MVS/XA Versions 2.1.3 and above

MVS/ESA Versions 3, 4 and 5

OS/390 Versions 1 and 2

To use the SPS PSORT facility you need at least MVS/ESA version 3. For some functions of the sorter, you need MVS/ESA version 4.

1.3 APA Support Summary

SPS processing support for APA single and twin printers can be divided into three major categories: user input, installation specifications, and RAS facilities. The main elements of these functions are listed in the following sections.

1.3.1 User Input

- **Input Data Stream Processing:** This processing accepts from the spooling system any user generated data stream that conforms to the *SPS Data Stream Reference Manual (SPDS)*. These data streams may include line data, composed text data and any resource type.
- **Resource Data Stream Processing:** This processing reads from libraries any input data stream or JCL referenced resources. These resources may be:
 - Form definitions (FORMDEF)
 - Page definitions (PAGEDEF)
 - Page segments
 - Overlays
 - Fonts (Coded Fonts, Font characters sets, Code pages)
 - Color mapping tables
- **Control File Support (extended JCL):** SPS reads control statements from control files. This action permits the selection of features and control of individual print job processing through overriding FORMDEF and PAGEDEF specifications that is not possible through normal JCL. The following functions are currently supported for APA single and twin printers:
 - Selection of the duplex options for both portrait and landscape pages: simplex, normal and tumble.
 - Selection of the twin duplex options for both portrait and landscape pages: zigzag, normal and zigzag tumble.
 - Selection of input bin and output stacker.
 - Two up printing.
 - Listing of active file options.
 - Copies with from/to pages.
 - Selection of eject to front facing function.

Flip print on twin printers.
Enhanced double byte character set usage.
3800 compatible media origin.
Selection of presentation.
Font pruning.
Input bin substitution.
Selection of chars, formdef and pagedef.
Warning only messages.
Spooled message page.

- **Job Control Language (JCL):** SPS accepts all page printer related JCL.
- **Message Generation:** SPS generates operator and user related messages concerning all phases of data stream processing. User messages are printed at the end of the user output or may be spinned off to a spool file.
- **Checkpointing:** Processing checkpoints may be requested by the user, or installation, on a time or page count interval basis. This facility permits the restart of a data stream interrupted by operator, user error or hardware error.

1.3.2 Installation Specifications

- **System parameters:** SPS supports a variety of initialization parameters and processing defaults. All options specified under control file support can be specified by an installation for a specific form or output class. The active setup and file parameters can be seen via the SDIS and FDIS SPS commands.
- **Information Pages:** SPS supports flexible, easily defined installation header, trailer, data set separator and message pages. Different information page formats may be defined for each printer, output class or form name. PSF compatible user exits for information pages are also supported.
- **Predefined Form Processing:** Any form can have installation defined print characteristics that will be used automatically when the form name is requested.
- Setup processing dependant on the number of input bins from a cutsheet printer is done.
- **Accounting:** SPS generates the standard SMF type 6 accounting record for all input data streams processed. If MVS is not able to write an SMF record, SPS informs the operator, allowing retry or ignore actions. Even when SPS abends or the MVS system crashes, SPS writes SMF records for the printing files (either at clean-up or at re-selection time) assuring a 100% reliable accounting system for the printing jobs.

- **User exits:** The following exit points are defined:
 - Record** This exit modifies, deletes or inserts records to be printed in the input data stream. Additional support for repositioning and paper jams is included in the input record exit interface. Each printer may have its own unique record processing exit.
 - Accounting** This exit modifies SMF type 6 accounting records generated by SPS. Each printer may have its own unique accounting exit.
 - Message** This exit performs special processing when any given message is issued. A different exit may be defined for each SPS message. Each printer may have its own unique set of message exits.
 - Direct** This exit provides full compatibility with IBM's direct printing exit interface and processing.
 - D/S Allocation** This exit may change the output file characteristics or request SPS to purge or hold a file without printing it. Each printer may have its own unique data-set allocation exit.
 - Resource read** This exit modifies, deletes or inserts resource records read from system or user libraries.
 - Page Segment** This exit allows SPS to continue processing if a page segment missing condition is reached.
 - PSF exits** These exits provide full compatible PSF exit interface for exits 1, 2 and 3. A subset of PSF exit interface 7 is provided.

1.3.3 Reliability, Availability, Serviceability (RAS)

- **Dumping:** Diagnostic dumps are automatically taken in the event of program or unexplained errors. For direct printing applications, SPS must be RACF authorized in order to be able to write SYSUDUMPs.
- **Tracing:** An SPS trace facility is defined which permits the collection of information on all phases of SPS processing. The level of detail of the trace information collected may be selected by the installation and varies from flow trace to all control blocks, input and output data.
- **Error recovery:** SPS provides full error recovery for APA printers and guarantees that print data sets are not purged from the JES spool unless successfully printed.
- **EREP:** In the event of a printer hardware error, SPS records an outboard type record in SYS1.LOGREC for analysis by EREP.

1.4 LIP Support Summary

SPS processing support for line image processor printers can be divided into three major categories: user input, installation specifications and RAS facilities. The main elements of these functions are listed in the following sections.

1.4.1 User Input

- **Input Data Stream Processing:** This processing accepts from the spooling system any user generated data stream that conforms to the *2050/2075-1X and -9X Electronic Printing System Reference Manual*. These data streams may include line data, 2050-100 text controls, IBM carriage controls and TRCs. All functions that are FCB2 or FCB3 compatibility may be used to control printing of data streams.
- **Printer Control Language Support (PCL):** This support performs the following functions related to PCL processing:
 - Select and load user specified PCL from a floppy or hard disk
 - Start a user specified PCL
 - Select and load fonts
 - Select and load overlays
 - Select embedded text control mode
- **Control File Support (extended JCL):** SPS reads control statements from control files permitting the selection of features and control of individual print job processing that is not possible through normal JCL. The following functions are currently supported for LIP printers:
 - Identify a PCL to be used
 - Selection of simplex, duplex and tumble
 - Selection of input bin and output stacker
 - Media selection (supported standard forms)
 - Right shifting of printout
 - Selection of overlays
 - Selection of initial font
 - Selection of embedded text control or line mode
 - SNI or IBM table reference characters (TRCs)
 - Rotation of input page

Blocking of character, page position and FCB length checks

- **Job Control Language (JCL):** SPS processes the following printer related fields of the DD and OUTPUT statements:

CKPTPAGE	Logical pages for checkpointing
CKPTSEC	Seconds for checkpointing
CLASS	Output class specification
CONTROL	Carriage control and line spacing
COPIES	Copy control
DATAACK	Block character or page position checks
DCB	Data control block
FCB	Forms control buffer specification
FORMS	User form specification
PIMSG	Print message control
SYSOUT	Class and form sub fields
TRC	Table reference character font selection

- **Message Generation:** SPS generates operator and user related messages concerning all phases of data stream processing. User messages are printed at the end of each user print data set or may optionally be suppressed.
- **Checkpointing:** Processing checkpoints may be requested by the user, or installation, on a time or page count interval basis. This facility permits the restart of a data stream interrupted by operator, user error or hardware error.

1.4.2 Installation Specifications

- **System parameters:** SPS supports a variety of initialization parameters and processing defaults. All options specified under control file support can be specified by an installation for a specific form or output class.
- **Information Pages:** SPS supports flexible, easily defined installation header, trailer, data set separator and message pages. Different information page formats may be defined for each printer, output class or form name.
- **Predefined Form Processing:** Any form can have installation defined print characteristics that will be used automatically when the form name is requested.
- **Accounting:** SPS generates the standard SMF type 6 accounting record for all input data streams processed.

- **User exits:** The following exit points are defined:
 - Record** This exit modifies, deletes or inserts records to be printed in the input data stream. Each printer may have its own unique record processing exit.
 - Accounting** This exit modifies SMF type 6 accounting records generated by SPS. Each printer may have its own unique accounting exit.
 - Message** This exit performs special processing when any given message is issued. A different exit may be defined for each SPS message. Each printer may have its own unique set of message exits.
 - D/S Allocation** This exit may change the output file characteristics or request SPS to purge or hold a file without printing it. Each printer may have its own unique data-set allocation exit.

1.4.3 Reliability, Availability, Serviceability (RAS)

- **Dumping:** Diagnostic dumps are automatically taken in the event of program errors or unexplained errors.
- **Tracing:** An SPS trace facility is defined which permits the collection of information on all phases of SPS processing. The level of detail of the trace information collected may be selected by the installation and varies from flow trace to all control blocks, input and output data.
- **Transparent data mode:** Printer is run in "transparent data" mode unless text control mode is specifically requested.
- **Error recovery:** SPS provides full error recovery for SNI LIP printers and guarantees that print data sets are not purged from the JES spool unless successfully printed.
- **EREP:** In the event of a printer hardware error, SPS records an outboard type record in SYS1.LOGREC for analysis by EREP.

1.5 MOD2 Support Summary

SPS processing support for enhanced printing mode capable printers can be divided into three major categories: user input, installation specifications and RAS facilities. The main elements of these functions are listed in the following sections.

1.5.1 User Input

- **Input Data Stream Processing:** This processing accepts from the spooling system any user generated data stream that conforms to the *2200 Model 2 and 2300 Model 2 Laser Printing Subsystem Programmer's Guide*. These data streams may include line data, 2200 and 2300 escape sequences identifying embedded text control for enhanced printing mode, IBM carriage controls, and TRCs. All functions of FCB3 processing may be used to control printing of data streams.
- **Enhanced Printing Mode Support (MOD2):** This support performs the following functions related to embedded text control processing:
 - Change character density
 - Change mode of byte transmission (single/double byte fonts)
 - Select/cancel inverse printing
 - Select/cancel wide printing
 - Select/cancel compressed input data processing
 - Select/cancel hardware underscore
 - Font selection without line merge (proportional fonts processing)
 - Activate/deactivate FOB's
 - Activate/deactivate copymod's
- **Control File Support (extended JCL):** SPS reads control statements from control files, permitting the selection of features and control of individual print job processing that is not possible through normal JCL. The following functions are currently supported for MOD2 printers:
 - Right shifting of printout
 - Selection and loading of forms overlay buffers
 - Selection and loading of character sets
 - Selection of embedded text control or line mode processing
 - Selection SNI or IBM table reference characters (TRC's)

Rotation of input page
Blocking of character checks
Two up processing
Dynamic forms control
User specified imagelib

- **Job Control Language (JCL):** SPS processes the following printer related fields of the DD and OUTPUT statements:

CHARS	Character sets
CKPTPAGE	Logical pages for checkpointing
CKPTSEC	Seconds for checkpointing
CLASS	Output class specification
CONTROL	Carriage control and line spacing
COPIES	Copy control
MODIFY	Copy modification
DATAACK	Block character or page position checks
DCB	Data control block
FCB	Forms control buffer specification
FLASH	Forms overlays
FORMS	User form specification
PIMSG	Print message control
SYSOUT	Class and form sub fields
TRC	Table reference character font selection

- **Message Generation:** SPS generates operator and user related messages concerning all phases of data stream processing. User messages are printed at the end of each user print data set or may optionally be suppressed.
- **Checkpointing:** Processing checkpoints may be requested by the user or installation on a time or page count interval basis. This facility permits the restart of a data stream interrupted by operator, user error, or hardware error.

1.5.2 Installation Specifications

- **System parameters:** SPS supports a variety of initialization parameters and processing defaults. All options specified under control file support above can be specified by an installation for a specific form or output class.
- **Information Pages:** SPS supports flexible, easily defined installation header, trailer, data set separator and message pages. Different information page formats may be defined for each printer, output class or form name.
- **Predefined Form Processing:** Any form can have installation defined print characteristics that will be used automatically when the form name is requested.
- **Accounting:** SPS generates the standard SMF type 6 accounting record for all input data streams processed.
- **User exits:** The following exit points are defined:

Record	This exit modifies, deletes or inserts records to be printed in the input data stream. Each printer may have its own unique record processing exit.
Accounting	This exit modifies SMF type 6 accounting records generated by SPS. Each printer may have its own unique accounting exit.
Message	This exit performs special processing when any given message is issued. A different exit may be defined for each SPS message. Each printer may have its own unique set of message exits.
D/S Allocation	This exit may change the output file characteristics or request SPS to purge or hold a file without printing it. Each printer may have its own unique data-set allocation exit.

1.5.4 Reliability, Availability, Serviceability (RAS)

- **Dumping:** Diagnostic dumps are automatically taken in the event of program errors or unexplained errors.
- **Tracing:** An SPS trace facility is defined which permits the collection of information on all phases of SPS processing. The level of detail of the trace information collected may be selected by the installation and varies from flow trace to all control blocks, input and output data.
- **Transparent data mode:** Printer is run in "transparent data" mode unless text control mode is specifically requested.
- **Error recovery:** SPS provides full error recovery for Océ MOD2 printers and guarantees that print data sets are not purged from the JES spool unless successfully printed. Physical forms alignment is maintained regardless of two up or rotate processing.
- **EREP:** In the event of a printer hardware error, SPS records an outboard type record in SYS1.LOGREC for analysis by EREP.

2 Installation and Customization

2.1 Installation Overview

The following tasks must be performed to install SPS:

1. Create the SMP environment
2. Receive SPS base and features
3. Allocate the DLIB's and target libraries
4. Adjust JCLIN for LPALIB installation (optional)
5. Adjust JCLIN for LINKLST installation (optional)
6. Apply SPS
7. Authorize SPS libraries in the system
8. Establish SPS program Properties
9. Define the SPSD subsystem to MVS
10. Set MIH values for the printers
11. Exclude SPS printers from SMS processing
12. Specify LSQA dumping for SPS
13. Set RACF authorization for SYSUDUMP processing
14. Define the SPS local printers to MVS
15. Define the SPS LU 6.2 network printers
16. Define the SPS LU 1 network printers
17. Define the SPS printers to JES
18. Install the start-up procedure(s)
19. Allocate the execution libraries

20. Create the SPS parameter library members
21. Allocate the control data sets
22. Define SPS Start-up Procedures and Data Sets to RACF
23. Test the SPS installation
24. Accept SPS

2.2 Model Jobs

SPS is distributed with model jobs and examples for all installation functions. The version, release and modification levels (vrm) in the fmids referenced in these jobs will need to be updated with the version, release and modification levels in the SPS release letter. After installation, you can find the examples in SPS.SPSSAMP. The examples are in SPSvrm0.F3 on the distribution tape. After performing the receive, you can access the examples under ISPF in the SPS.SPSvrm0.F3 data set, where **v** is the version, **r** is the release, and **m** is the modification level of the distribution tape. The member names are the same in this data set as they are when moved to the target library. They can be used from SPS.SPSvrm0.F3 for installation purposes and their member names will be mentioned throughout this document whenever models or examples are available.

The library model members for parameters have names ending in **XXX** for APA printers, **YYY** for LIP printers, and **ZZZ** for MOD2 printers. Throughout this document the member names in the text ending in **xxx** are examples of APA printer parameter requirements, members ending in **yyy** are LIP parameter requirements, members ending in **zzz** are MOD2 parameter requirements and members ending in **nnn** indicate the statement applies to APA, LIP and MOD2 parameter requirements.

Sample member names for special forms processing end in **FFFF**, **GGGG**, and **HHHH** for APA, LIP and MOD2 forms respectively. Throughout this document the form member names in the text ending in **fff** refer to APA forms, form member names ending in **gggg** refer to LIP forms, form member names ending in **hhhh** refer to MOD2 forms and form member names ending in **aaaa** indicate that the statement applies to APA, LIP and MOD2 forms.

2.3 Basic Machine Readable Material

SPS is shipped as 3 FMIDs, a base product and one or two printer driver features. If you are ordering the APA feature, you receive in the same tape four additional FMIDs which you may optionally install. FMID SPSvrm3 contains standard resources for 240 dpi printers, FMID SPSvrm4 contains standard resources for 300 dpi printers (with fixed metric fonts), FMID SPSvrm5 contains resources for 300 dpi printers (with relative metric fonts) and FMID SPSvrm6 contains resources for 600 dpi printers. These delivered resources are described in manuals *SPS APA Standard Resources Description*, *SPS APA Type Fonts with 240 dpi*, *SPS APA Type Fonts with 300 dpi (fixed metric)*, *SPS APA Type Fonts with 300 dpi (relative metric)* and *SPS APA Type Fonts with 600 dpi*. The distribution media for SPS is one standard label tape for the base FMID and one additional tape for each printer driver feature ordered. The tapes have standard labels with volume serials PSvrm0, PSvrm1, and PSvrm2, where the volume serials are the right 6 characters of the current FMID's of the product, with **v**, **r**, and **m** being the version, release, and modification levels provided in the release letter.

The tapes are formatted as SMP compatible relative file tapes. SPS is packaged as functional sysmods and should be installed in the operating system using SMPE. The 5 tape files delivered on the SPS base product installation tape can be found in Table 1 on page 17. The 5 tape files delivered on the SPS LINE printer driver feature tape can be found in Table 2. The 26 tape files delivered on the SPS APA printer driver feature tape can be found in Table 3.

FILE	NAME	DSORG	BLKSIZE	DESCRIPTION
1	SMPMCS	PS	80	SMPPTFIN
2	SPSvrm0.F1	PO	3120	JCLIN
3	SPSvrm0.F2	PO	6144	Module Library
4	SPSvrm0.F3	PO	3120	Sample Library
5	SPSvrm0.F4	PO	5020	Message Library

Table 1: Distribution Tape Files for SPS Base Product

FILE	NAME	DSORG	BLKSIZE	DESCRIPTION
1	SMPMCS	PS	80	SMPPTFIN
2	SPSvrm1.F1	PO	3120	JCLIN
3	SPSvrm1.F2	PO	6144	Module Library
4	SPSvrm1.F3	PO	3120	Sample Library
5	SPSvrm1.F4	PO	5020	Message Library

Table 2: Distribution Tape Files for SPS LINE Printer Driver

Installation and Customization

FILE	NAME	DSORG	BLKSIZE	DESCRIPTION
1	SMPMCS	PS	80	SMPPTFIN
2	SPSvrm2.F1	PO	3120	JCLIN
3	SPSvrm2.F2	PO	6144	Module Library
4	SPSvrm2.F3	PO	3120	Sample Library
5	SPSvrm2.F4	PO	5020	Message Library
6	SPSvrm2.F5	PO	8209	IVP Library
7	SPSvrm2.F6	PO	32760	Object Container Library
8	SPSvrm3.F1	PO	8209	240 dpi Formdefs
9	SPSvrm3.F2	PO	8209	240 dpi Pagedefs
10	SPSvrm3.F3	PO	8209	240 dpi Overlays
11	SPSvrm3.F4	PO	8209	240 dpi Page Segments
12	SPSvrm3.F5	PO	8209	240 dpi Fonts
13	SPSvrm4.F1	PO	8209	300 dpi Formdefs (fixed)
14	SPSvrm4.F2	PO	8209	300 dpi Pagedefs (fixed)
15	SPSvrm4.F3	PO	8209	300 dpi Overlays (fixed)
16	SPSvrm4.F4	PO	8209	300 dpi Page Segments (fixed)
17	SPSvrm4.F5	PO	8209	300 dpi Fonts (fixed)
18	SPSvrm5.F1	PO	8209	300 dpi Formdefs (relative)
19	SPSvrm5.F2	PO	8209	300 dpi Pagedefs (relative)
20	SPSvrm5.F3	PO	8209	300 dpi Overlays (relative)
21	SPSvrm5.F4	PO	8209	300 dpi Page Segments (relative)
22	SPSvrm5.F5	PO	8209	300 dpi Fonts (relative)
23	SPSvrm6.F1	PO	8209	600 dpi Formdefs
24	SPSvrm6.F2	PO	8209	600 dpi Pagedefs
25	SPSvrm6.F3	PO	8209	600 dpi Overlays
26	SPSvrm6.F4	PO	8209	600 dpi Page Segments
27	SPSvrm6.F5	PO	8209	600 dpi Fonts

Table 3: Distribution Tape Files for SPS APA Printer Driver

2.4 CREATE the SMP environment

To install SPS, you may use an SMP environment that already exists, (CSI and other SMP data-sets, zones, etc...) or you may create a complete new SMP environment (inclusive CSI). If you are using an existing SMP/E environment, you may proceed to the next Section, 2.5 RECEIVE the product. The sample job SPSISSMP creates a complete SMP environment for all SPS FMIDs. You may run the whole job or just the steps you are interested in. Some installation related updates should be done in this job as specified in the job itself.

You should use the IEBCOPY job listed below (SPSJ00 sample) in order to load job SPSISSMP from the SPS base product tape (volume serial PSvrm0²). This IEBCOPY also loads the members SMPPROC (a sample SMP/E procedure which may be customized by the installation) and SPSISRE0 (sample SMP/E receive job). After the receive is done, all other samples may be found in the SAMPLE library relfile loaded.

Maybe it is more convenient for you to leave SMPPROC in the USERLIB (instead of copying it into any proclib) and using the JCLLIB statement in the corresponding jobs.

```
//SPSJ00 JOB 'ACCOUNT #', 'NAME', MSGLEVEL=(1,1)
//SPSJ00C EXEC PGM=IEBCOPY
//SYSPRINT DD SYSOUT=*
//PSvrm0 DD DSN=SPSvrm0.F3,UNIT=tape,LABEL=(4,SL),DISP=SHR,
// VOL=SER=PSvrm0
//USERLIB DD DSN=USER.USERLIB,DISP=SHR
//SYSIN DD *
COPY O=USERLIB,I=PSvrm0
S M=(SPSISSMP,SPSISRE0,SMPPROC)
/*
```

Figure 1: Sample job to load SPSISSMP from tape (SPSJ00)

Once SPSJ00 has run, you should customize SPSISSMP to conform to installation requirements, and then run it.

The following table shows the disk space used by the SMP files allocated by job SPSISSMP, assuming you use a 3380 disk.

DATA SET	RECFM	LRECL	BLKSIZE	CYLS	DIR
CSI.DATA	KSDS	143	4096	8,1	-
CSI.INDEX	KSDS	-	-	1,1	-
SMPLOG	VB	260	3200	3	-

² Where **v** is the version, **r** is the release, and **m** is the modification level of the delivered version.

SMPLOGA	VB	260	3200	3	-
SMPPTS	FB	80	23440	30,5	46
SMPMTS	FB	80	23440	1,1	46
SMPSTS	FB	80	23440	1,1	46
SMPSCDS	FB	80	23440	1,1	46

Table 4: SMP Data Set Allocations (job SPSISSMP)

2.5 RECEIVE the Product

Perform a standard receive of SPS, which is shipped as functional sysmods. The model job in Figure 2 can be modified to suit installation requirements and used to receive the product. To receive the printer driver features, the fmid SPSvrm0 and volser PSvrm0 in the model should be changed to the corresponding fmid(s) for the driver(s) ordered. An appropriate model job tailored to the ordered fmid is shipped with each fmid and can be found in the respective SPS.fmid.F3 library as either SPSISRE0, SPSISRE1 or SPSISRE2. If you are installing the APA driver you may optionally receive the FMIDs SPSvrm3 (standard resources for 240 dpi printers) and/or SPSvrm4 (standard resources for 300 dpi printers - with fixed metric fonts) and/or SPSvrm5 (standard resources for 300 dpi printers - with relative metric fonts) and/or SPSvrm6 (standard resources for 600 dpi printers).

```
//RECEIVE JOB 'ACCOUNT #', 'NAME', MSGLEVEL=(1,1)
//RECEIVE EXEC SMPPROC
//SMP.SMPPTFIN DD DSN=SMPMCS, DISP=(OLD, PASS),
//              VOL=SER=PSvrm0, LABEL=(1, SL),
//              UNIT=(tape, , DEFER)
//SMP.SYSIN DD * (SMPCNTL)
              SET BDY(GLOBAL) .
              RECEIVE S(SPSvrm0) SYSMOD .
/*
```

Figure 2: Sample SMP Receive Job (SPSISRE0)

2.6 Allocate the SPS/MVS Install Data Sets

SPS LIP/MOD2 requires 3 DLIB data sets and 3 target libraries. SPS APA requires 4 DLIB data sets and 4 target libraries. If you install any resource FMIDs, SPS requires 5 additional DLIB and target libraries per FMID. These libraries have been named for distribution purposes as shown in Table 5. The names of the data sets are arbitrary, as all references to libraries by SPS and SMP are by ddname. The systems programmer may

choose any names convenient to the installation. However, throughout this document all references to these data sets will be by the names used in the table.

DATA SET	SMP DDNAME	FUNCTION
SPS.ASPSDLIB	ASPSDLIB	DLIB module library
SPS.ASPSSAMP	ASPSSAMP	DLIB sample library
SPS.ASPSMESS	ASPSMESS	DLIB message library
SPS.SPSLINK	SPSLINK	Target load library
SPS.SPSSAMP	SPSSAMP	Target sample library
SPS.SPSMESS	SPSMESS	Target message library
SPS.ASPSIVP	ASPSIVP	DLIB APA IVP library
SPS.SPSIVP	SPSIVP	Target APA IVP library
SPS.APSOBJC	APSOBJC	DLIB Object Container Library
SPS.SPSOBJC	SPSOBJC	Target Object Container Library
SPS.ASPSFD24	ASPSFD24	DLIB formdef library for 240 dpi
SPS.ASPSPD24	ASPSPD24	DLIB pagedef library for 240 dpi
SPS.ASPSOL24	ASPSOL24	DLIB overlay library for 240 dpi
SPS.ASPSPS24	ASPSPS24	DLIB page segment library for 240 dpi
SPS.ASPSFO24	ASPSFO24	DLIB font library for 240 dpi
SPS.SPSFD24	SPSFD24	Target formdef library for 240 dpi
SPS.SPSPD24	SPSPD24	Target pagedef library for 240 dpi
SPS.SPSOL24	SPSOL24	Target overlay library for 240 dpi
SPS.SPSPS24	SPSPS24	Target page segment library for 240 dpi
SPS.SPSFO24	SPSFO24	Target font library for 240 dpi
SPS.ASPSFD30	ASPSFD30	DLIB formdef library for 300 dpi
SPS.ASPSPD30	ASPSPD30	DLIB pagedef library for 300 dpi
SPS.ASPSOL30	ASPSOL30	DLIB overlay library for 300 dpi
SPS.ASPSPS30	ASPSPS30	DLIB page segment library for 300 dpi
SPS.ASPSFO30	ASPSFO30	DLIB font library for 300 dpi
SPS.SPSFD30	SPSFD30	Target formdef library for 300 dpi
SPS.SPSPD30	SPSPD30	Target pagedef library for 300 dpi
SPS.SPSOL30	SPSOL30	Target overlay library for 300 dpi
SPS.SPSPS30	SPSPS30	Target page segment library for 300 dpi
SPS.SPSFO30	SPSFO30	Target font library for 300 dpi

DATA SET	SMP DDNAME	FUNCTION
SPS.ASPSFD3R	ASPSFD3R	DLIB formdef library for 300 dpi (relative)
SPS.ASPSPD3R	ASPSPD3R	DLIB pagedef library for 300 dpi (relative)
SPS.ASPSOL3R	ASPSOL3R	DLIB overlay library for 300 dpi (relative)
SPS.ASPSPS3R	ASPSPS3R	DLIB page segment library for 300 dpi (relative)
SPS.ASPSFO3R	ASPSFO3R	DLIB font library for 300 dpi (relative)
SPS.SPSFD3R	SPSFD3R	Target formdef library for 300 dpi (relative)
SPS.SPSPD3R	SPSPD3R	Target pagedef library for 300 dpi (relative)
SPS.SPSOL3R	SPSOL3R	Target overlay library for 300 dpi (relative)
SPS.SPSPS3R	SPSPS3R	Target page segment library for 300 dpi (relative)
SPS.SPSFO3R	SPSFO3R	Target font library for 300 dpi (relative)
SPS.ASPSFD60	ASPSFD60	DLIB formdef library for 600 dpi
SPS.ASPSPD60	ASPSPD60	DLIB pagedef library for 600 dpi
SPS.ASPSOL60	ASPSOL60	DLIB overlay library for 600 dpi
SPS.ASPSPS60	ASPSPS60	DLIB page segment library for 600 dpi
SPS.ASPSFO60	ASPSFO60	DLIB font library for 600 dpi
SPS.SPSFD60	SPSFD60	Target formdef library for 600 dpi
SPS.SPSPD60	SPSPD60	Target pagedef library for 600 dpi
SPS.SPSOL60	SPSOL60	Target overlay library for 600 dpi
SPS.SPSPS60	SPSPS60	Target page segment library for 600 dpi
SPS.SPSFO60	SPSFO60	Target font library for 600 dpi

Table 5: SPS Libraries

Table 6 on page 23 documents the space and record format requirements of SPS. If disk space is to be minimized, then large secondary allocations should be used. All block sizes may be increased if desired.

The SPS install data sets may be allocated and catalogued with the model job SPSIALOC. This job contains the suggested space allocations and record formats. The DLIB and target library volumes must be set to the installation requirements. The data set prefix may also be changed.

The SPS install data sets should be protected by whatever security product the installation uses.

DDDEF's should be defined for each of the ddnames in Table 7 on page 25. The suggested attributes will simplify maintenance procedures. If you have run the sample job SPSISSMP, these DDDEF's are already defined.

DATA SET	RECFM	LRECL	BLKSIZE	BLOCKS	DIR
SPS.ASPSDLIB	U	-	6144	900,100	42
SPS.ASPSSAMP	FB	80	3120	1200,120	40
SPS.ASPSMESS	VB	251	5020	50,10	5
SPS.SPSSLINK	U	-	6144	1800,200	16
SPS.SPSSAMP	FB	80	3120	1200,120	40
SPS.SPSMESS	VB	251	5020	50,10	5
SPS.ASPSIVP	VBM	8205	8209	2000,100	56
SPS.SPSIVP	VBM	8205	8209	2000,100	56
SPS.ASPSOBJC	VBM	32756	32760	15,15	5
SPS.SPSOBJC	VBM	32756	32760	15,15	5
SPS.ASPSFD24	VBM	8205	8209	15,15	28
SPS.ASPSPD24	VBM	8205	8209	120,15	28
SPS.ASPSOL24	VBM	8205	8209	240,60	28
SPS.ASPSPS24	VBM	8205	8209	120,30	28
SPS.ASPSFO24	VBM	8205	8209	480,90	28
SPS.SPSFD24	VBM	8205	8209	15,15	28
SPS.SPSPD24	VBM	8205	8209	120,15	28
SPS.SPSOL24	VBM	8205	8209	240,60	28
SPS.SPSPS24	VBM	8205	8209	120,30	28
SPS.SPSFO24	VBM	8205	8209	480,90	28
SPS.ASPSFD30	VBM	8205	8209	15,15	28
SPS.ASPSPD30	VBM	8205	8209	120,15	28
SPS.ASPSOL30	VBM	8205	8209	240,60	28
SPS.ASPSPS30	VBM	8205	8209	120,30	28
SPS.ASPSFO30	VBM	8205	8209	480,90	28
SPS.SPSFD30	VBM	8205	8209	15,15	28

DATA SET	RECFM	LRECL	BLKSIZE	BLOCKS	DIR
SPS.SPSPD30	VBM	8205	8209	120,15	28
SPS.SP SOL30	VBM	8205	8209	240,60	28
SPS.SPSPS30	VBM	8205	8209	120,30	28
SPS.SP SFO30	VBM	8205	8209	480,90	28
SPS.ASPSFD3R	VBM	8205	8209	15,15	28
SPS.ASPSPD3R	VBM	8205	8209	120,15	28
SPS.ASP SOL3R	VBM	8205	8209	240,60	28
SPS.ASPSPS3R	VBM	8205	8209	120,30	28
SPS.ASPSFO3R	VBM	8205	8209	480,90	28
SPS.SP SFD3R	VBM	8205	8209	15,15	28
SPS.SPSPD3R	VBM	8205	8209	120,15	28
SPS.SP SOL3R	VBM	8205	8209	240,60	28
SPS.SPSPS3R	VBM	8205	8209	120,30	28
SPS.SP SFO3R	VBM	8205	8209	480,90	28
SPS.ASPSFD60	VBM	8205	8209	15,15	28
SPS.ASPSPD60	VBM	8205	8209	120,15	28
SPS.ASP SOL60	VBM	8205	8209	240,60	28
SPS.ASPSPS60	VBM	8205	8209	120,30	28
SPS.ASPSFO60	VBM	8205	8209	700,100	28
SPS.SP SFD60	VBM	8205	8209	15,15	28
SPS.SPSPD60	VBM	8205	8209	120,15	28
SPS.SP SOL60	VBM	8205	8209	240,60	28
SPS.SPSPS60	VBM	8205	8209	120,30	28
SPS.SP SFO60	VBM	8205	8209	700,100	28

Table 6: SPS Data Set Allocations

DDDEF	ZONE	DATA SET	INITIAL	FINAL	WAITFORDSN
ASPSDLIB	DLIB	SPS.ASPSDLIB	OLD	KEEP	YES
ASPSSAMP	DLIB	SPS.ASPSSAMP	OLD	KEEP	YES
ASPSMESS	DLIB	SPS.ASPSMESS	OLD	KEEP	YES
SPSLINK	TARGET	SPS.SPSLINK	SHR	KEEP	YES
SPSSAMP	TARGET	SPS.SPSSAMP	SHR	KEEP	YES
SPSMESS	TARGET	SPS.SPSMESS	SHR	KEEP	YES
ASPSIVP	DLIB	SPS.ASPSIVP	OLD	KEEP	YES
SPSIVP	TARGET	SPS.SPSIVP	SHR	KEEP	YES
ASPSOBJC	DLIB	SPS.APSOBJC	OLD	KEEP	YES
SPSOBJC	TARGET	SPS.SPSOBJC	SHR	KEEP	YES
ASPSFD24	DLIB	SPS.ASPSFD24	OLD	KEEP	YES
ASPSPD24	DLIB	SPS.ASPSPD24	OLD	KEEP	YES
ASPSOL24	DLIB	SPS.ASPSOL24	OLD	KEEP	YES
ASPSPS24	DLIB	SPS.ASPSPS24	OLD	KEEP	YES
ASPSFO24	DLIB	SPS.ASPSFO24	OLD	KEEP	YES
SPSFD24	TARGET	SPS.SPSFD24	SHR	KEEP	YES
SPSPD24	TARGET	SPS.SPSPD24	SHR	KEEP	YES
SPSOL24	TARGET	SPS.SPSOL24	SHR	KEEP	YES
SPSPS24	TARGET	SPS.SPSPS24	SHR	KEEP	YES
SPSFO24	TARGET	SPS.SPSFO24	SHR	KEEP	YES
ASPSFD30	DLIB	SPS.ASPSFD30	OLD	KEEP	YES
ASPSPD30	DLIB	SPS.ASPSPD30	OLD	KEEP	YES
ASPSOL30	DLIB	SPS.ASPSOL30	OLD	KEEP	YES
ASPSPS30	DLIB	SPS.ASPSPS30	OLD	KEEP	YES
ASPSFO30	DLIB	SPS.ASPSFO30	OLD	KEEP	YES
SPSFD30	TARGET	SPS.SPSFD30	SHR	KEEP	YES
SPSPD30	TARGET	SPS.SPSPD30	SHR	KEEP	YES
SPSOL30	TARGET	SPS.SPSOL30	SHR	KEEP	YES
SPSPS30	TARGET	SPS.SPSPS30	SHR	KEEP	YES
SPSFO30	TARGET	SPS.SPSFO30	SHR	KEEP	YES
ASPSFD3R	DLIB	SPS.ASPSFD3R	OLD	KEEP	YES
ASPSPD3R	DLIB	SPS.ASPSPD3R	OLD	KEEP	YES

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DDDEF	ZONE	DATA SET	INITIAL	FINAL	WAITFORDSN
ASPSOL3R	DLIB	SPS.ASPSOL3R	OLD	KEEP	YES
ASPSPS3R	DLIB	SPS.ASPSPS3R	OLD	KEEP	YES
ASPSFO3R	DLIB	SPS.ASPSFO3R	OLD	KEEP	YES
SPSFD3R	TARGET	SPS.SPSFD3R	SHR	KEEP	YES
SPSPD3R	TARGET	SPS.SPSPD3R	SHR	KEEP	YES
SPSOL3R	TARGET	SPS.SPSOL3R	SHR	KEEP	YES
SPSPS3R	TARGET	SPS.SPSPS3R	SHR	KEEP	YES
SPSFO3R	TARGET	SPS.SPSFO3R	SHR	KEEP	YES
ASPSFD60	DLIB	SPS.ASPSFD60	OLD	KEEP	YES
ASPSPD60	DLIB	SPS.ASPSPD60	OLD	KEEP	YES
ASPSOL60	DLIB	SPS.ASPSOL60	OLD	KEEP	YES
ASPSPS60	DLIB	SPS.ASPSPS60	OLD	KEEP	YES
ASPSFO60	DLIB	SPS.ASPSFO60	OLD	KEEP	YES
SPSFD60	TARGET	SPS.SPSFD60	SHR	KEEP	YES
SPSPD60	TARGET	SPS.SPSPD60	SHR	KEEP	YES
SPSOL60	TARGET	SPS.SPSOL60	SHR	KEEP	YES
SPSPS60	TARGET	SPS.SPSPS60	SHR	KEEP	YES
SPSFO60	TARGET	SPS.SPSFO60	SHR	KEEP	YES

Table 7: SPS DDDEF Allocations

2.7 Adjust JCLIN for LPALIB Installation

This step is only necessary if you want to install the re-entrant parts of SPS in the LPA/ELPA instead of in SPS.SPSSLINK. To determine whether it is useful to install SPS in the installation LPA/ELPA, please read "Virtual and Real Storage Considerations" on page 57 and "Memory" on page 71. This function can also be performed with UCLIN if the installation prefers.

Duplicate the JCLIN for the link-edits of base product modules SPSMFSS, SPSMLI (alias SPSMFSSM), SPSMDOPN, IGG019WM and IGG019WS (these 2 last modules may have another, user specified name. Please see section 2.9 APPLY the Product on page 29). Duplicate the JCLIN as needed for link-edits of LINE modules SPSPLINE, SPSPLIP and SPSPEPM, or APA module SPSPAPA2. The modules SPSMPDEF, SPSMGDA and all the header, separator, message, and trailer page load modules cannot be moved to LPALIB as they are actually non-reentrant data areas. The direct printing modules SPSMDCAU, SPSMDLCN, SPSMDLOP and SPSMDSSI should not be installed in LPALIB. They will only waste LPA space when installed in LPALIB.

The JCLIN may be found in the respective SPS.fmid.F1 library and may be altered using the ISPF editor. Change the copies from the distribution coded library name SPS.SPSSLINK to SYS1.LPALIB. Any library that is used in the building of LPA during initialization may be selected instead of SYS1.LPALIB. The list of libraries in the installation that are used to build LPA can be found in LPALST00 of SYS1.PARMLIB. Additionally an installation may use libraries in LPALSTxx members that are selected by the LPA parameter in IEASYS00.

The duplication of the link-edits is recommended so that the entire SPS product is in one library that can be used as a steplib. This is useful for testing and after maintenance is applied. When LPALIB is used for the re-entrant SPS modules and the modules are also in SPSSLINK, SPSSLINK must be in linklst. If SPSSLINK is used as a steplib, the LPA copies will be ignored.

If you change the SPS JCLIN at installation time, you must also change any JCLIN update received in future PTFs.

2.7.1 I/O Appendages: IGG019WM and IGG019WS

The modules IGG019WM and IGG019WS are intended to be placed in SYS1.SVCLIB. This is due to an MVS requirement, as these modules are the I/O appendages that will be used when sending I/O to your printers. (if you do not have channel-attached printers, the location of these modules does not matter, and you may update the JCLIN to place them in SPSSLINK, as you like.) There is only one other location that these modules may reside, LPALIB. You may load them into SYS1.LPALIB or another LPALST library. Leaving these modules in SPSSLINK will make the product unusable for channel-attached printers.

2.8 Adjust JCLIN for LINKLST Installation

This step is optional. You need to do this step if you will use SPS in direct printing mode and the SPSSLINK is in the linklst concatenation. You need to do this step only if you will use SPS in direct printing mode (that is, bypassing JES), and the SPSSLINK library is not in the LINKLST concatenation. When an installation is installing SPS as part of the linklst concatenation, the direct printing modules that are normally directed to LINKLIB by the supplied JCLIN can be linked into SPS.SPSSLINK. This will keep the SPS load modules in one library, which can facilitate testing of new releases of SPS. To install the direct printing modules in SPS.SPSSLINK, change the target library on the JCLIN link step for SPSMDCAU, SPSMDLCN, SPSMDLOP and SPSMDSSI to SPS.SPSSLINK from SYS1.LINKLIB.

If you change the SPS JCLIN at installation time, you must also change any JCLIN update received in future PTFs.

2.9 APPLY the Product

Perform a standard apply check for functional sysmods and then apply SPS. The model job in Figure 3 can be modified to suit installation requirements and used to apply the SPS base product and any requested drivers. If you are installing the APA driver you may also apply FMIDs SPSvrm3 (240 dpi resources) and/or SPSvrm4 (300 dpi resources with fixed metric fonts) and/or SPSvrm5 (300 dpi resources with relative metric fonts) and/or SPSvrm6 (600 dpi resources). Model apply jobs tailored to the ordered fmid are shipped with each fmid in their SPS.fmid.F3 libraries in member names SPSISAP0, SPSISAP1 and SPSISAP2 respectively. The model jobs are supplied with commented out DD cards for SVCLIB and LINKLIB, where appropriate. For SMPE processing, if the installation does not have DDDEF's defined for these data sets, these cards should be updated to suit installation requirements. Warning message GIM44402W issued for SPSIX23, SPSIXMSG, SPSIX45, SPSMDSFC, SPSMDS10, SPSMRE10 and SPSMRR10 can be ignored.

```
//APPLY JOB 'ACCOUNT #', 'NAME', MSGLEVEL=(1,1)
//APPLY EXEC SMPPROC
//SMP.SYSIN DD * (SMPCNTL)
//*SMP.SVCLIB DD DSN=SYS1.SVCLIB,UNIT=XXXX,DISP=SHR,
//* VOL=SER=NNNNNN
//SMP.LINKLIB DD DSN=SYS1.LINKLIB,UNIT=XXXX,DISP=SHR,
//* VOL=SER=NNNNNN

SET BDY(SPSvrmT) .
APPLY CHECK S(SPSvrm0) .
/*
```

Figure 3: Sample SMP Apply Job (SPSISAP0)

As discussed in Section 2.7, the SPS base function has two I/O appendage routines that are placed in SVCLIB: startio and abnormal end. As distributed, these appendages are named IGG019WS and IGG019WM, respectively. If either of these appendage names has already been used by the installation for some other product or function, an alternate name may be chosen by changing the last two characters of the name and updating the JCLIN link-edit of this module to the new name. The JCLIN can be found in SPS.SPSvrm0.F1³ after receiving the product. An example of changing the appendage name IGG019WM to IGG019ZZ is shown in Figure 4. The use of this new name should be indicated in the SIOAPG or ABENDAPG parameter of the setup member for each printer when the SPS parameters are filled out. Please see SIOAPG or ABENDAPG parameter in the *SPS/MVS-APA*, *SPS/MVS-LIP* or the *SPS/MVS-MOD2 Administrator's Guide* for further information.

³ Where **v** is the version, **r** is the release, and **m** is the modification level of the delivered version.

```
//STEP5 EXEC PGM=IEWL,REGION=512K,  
// PARM='MAP,RENT,NCAL,LIST,LET,XREF,AC=0'  
//SYSUT1 DD UNIT=SYSDA,SPACE=(CYL,(4,1))  
//SYSPRINT DD SYSOUT=A  
//SYSLMOD DD DSN=SYS1.SVCLIB,DISP=SHR  
//ASPSDLIB DD DSN=SYS1.ASPSDLIB,DISP=SHR  
//SYSLIN DD *  
INCLUDE ASPSDLIB(IGG019WM)  
ENTRY IGG019WM  
NAME IGG019ZZ(R)
```

Figure 4: Sample JCLIN Modification for Appendage Named ZZ

2.10 Authorize SPS Libraries in the System

The SPS target load library must be authorized. SPS can be run as an authorized steplib, as a member of linklst or loaded from lpa. When run as an authorized steplib, the SPS load library name must be added to the IEAAPF00 member of SYS1.PARMLIB. When run as a member of linklst, the SPS load library name must be added to linklst, and if the installation linklst is not authorized then it must also be added to IEAAPF00. When loaded from the LPA, no special action is necessary as modules loaded from LPA are normally authorized. Model statements for these procedures can be found in members SPSIAPF and SPSILNK of SPS.SPSSAMP.

Alternatively in OS/390 systems you can use the PROGxx parmlib member which allows you to update the APF list dynamically and specify an unlimited number of APF-authorized libraries. Update PROGxx which looks like:

APF ADD

DSNAME(SPS.V380.SPSSLINK)

VOLUME(SPS000)

2.11 Establish SPS Program Properties

SPS must be non-swappable and execute in program key 1. These properties are given to a program in the SCHED00 member of SYS1.PARMLIB.

SCHED00 update is simply coding the PPT statement (see Figure 5). A model statement can be found at the beginning of SPSIPPT in SPS.SPSSAMP.

```
PPT PGMNAME (SPSMFSS)      /* PROGRAM NAME          */
NOSWAP                     /* NON-SWAPPABLE         */
KEY (1)                    /* PROTECTION KEY        */
AFF (NONE)                 /* NO PROCESSOR AFFINITY */
NODSI                      /* NO DATA SET INTEGRITY */
```

Figure 5: Sample PPT statement for SCHED00 in SYS1.PARMLIB

2.12 Define the SPSS Subsystem to MVS

This step is optional. You need to do this step if you will use SPS in direct printing mode. The direct printing subsystem must be defined to MVS. The subsystem name for SPS must always be SPSS. The name must be defined in the subsystems definition member IEFSSN00 located in SYS1.PARMLIB. The subsystem definition statement in Figure 6 should be added to the installation IEFSSN00 member. This statement is also provided in model member SPSISSN of SPS.SPSSAMP.

```
SPSS,SPSSMDSSI             /* SPSS: DIRECT PRINTING SUBSYSTEM */
```

Figure 6: Sample subsystem SPSS definition for IEFSSN00 in SYS1.PARMLIB

OS/390 now supports the keyword parameter form of the IEFSSNxx parmlib member which looks like:

```
SUBSYS SUBNAME(SPSS)      /* SPSS: direct printing subsystem */
INITRTN(SPSSMDSSI)
```

2.13 Set MIH Value for APA and LINE Printers

The execution of certain functions on APA and LINE printers may take longer than the default time allowed for I/O operations by the operating system. On LIP printers, from the time a PCL is requested until the time it is fully loaded into the printer, no interrupt is returned to the operating system. On APA, LIP and MOD2 printers, no interrupt is returned

during page copy operations until the last page copy is printed. These operations may take much longer than the default 3 minute MIH time out in the operating system. Therefore all APA and LINE printers should be defined in IECIOS00 by device number, with a large time interval for I/O operations. The suggested value for LINE printers is 15 minutes, for APA single and twin printers 10 minutes (please see Figure 7).

```
APA Single printer:
  MIH DEV=(XXX),           /* APA device number    */
    TIME=10:00             /* 10 minute time out   */

APA Twin printer:
  MIH DEV=(XXX),           /* APA device number    */
    TIME=10:00             /* 10 minute time out   */
  MIH DEV=(ZWW),           /* 2nd APA device number */
    TIME=10:00             /* 10 minute time out   */

LINE LIP printer:
  MIH DEV=(YYY),           /* LIP device number    */
    TIME=15:00             /* 15 minute time out   */

LINE MOD2 printer:
  MIH DEV=(ZZZ),           /* MOD2 device number   */
    TIME=15:00             /* 15 minute time out   */
```

Figure 7: Sample MIH statements for IECIOS00 in SYS1.PARMLIB

2.14 Exclude SPS printers from SMS processing

If you use SMS in your MVS system, you should insure that the printer device addresses are outside the range managed by SMS. You may need to use an ACS storage class routine – STRCLVxx – to exclude a storage class assignment for the addresses of SPS printers. If SMS assigns a storage class to SPS printers, either an abend S300 or an abend U455 (with the CSW as 00000000 00000000 in message SPS0425E) may occur when SPS performs the first I/O to the printer.

2.15 Specify LSQA dumping for SPS

SPS uses an internal trace table when TRACELEV(0) is specified. In this trace table are recorded events from the DIE exit, JES X-memory routines and direct printing open/close routines. For this reason, the trace table needs to be fixed in the LSQA. To have the trace table dumped in case of an abend, your dump options member in SYS1.PARMLIB (i.e. IEADMP00 for SYSUDUMP) should specify SDATA=(LSQA) or SDATA=(ALLSDATA).

2.16 RACF authorization for SYSUDUMP processing

Starting with OS/390 version 1.3, APF-authorized programs (like SPS) were not allowed to dump into SYSUDUMP, SYSABEND or SYSMDUMP. With apar OW27748 this processing was changed in order to allow APF-authorized started tasks to dump, but requires RACF authorization via a new RACF class for APF-authorized jobs. So, if you run SPS in direct printing mode (i.e., as a JOB) in OS/390 with apar OW27748 you need to RACF-authorize SPS in order to obtain any dump.

2.17 Define the SPS local Printers to MVS

The SPS local driven printers must be defined in the IOCP and MVS configurations. For all SP2.2 (XA) or above systems, an IODEVICE macro must be present in both the IOCP generation and the MVS Configuration Program run. For previous systems, the IODEVICE macro must be in the IOCP generation and the I/O generation. Single printers, either APA or LINE, have one physical address and require one IODEVICE macro. Twin printers are two separate printers, each operating as a separate print station. Twin printers have one physical address for each printer station and may be separated into two single printers. Therefore each printer requires two IODEVICE macros for each twin printer combination.

The CNTLUNIT macro is also necessary for the IOCP generation.

SPS also supports printers generated as dynamic devices via the Hardware Configuration Definition (HCD).

SPS supports I/O devices with four digit device addresses.

SPS supports UCBs above the line.

If your printer is connected via an NSC channel extender you should use version 8.x or later from the RDS software and generate your printer for RDS as an Océ device type (not an AFP).

The device types for the current Océ local printer models are:

- APA single printers defined as unsupported devices
- APA twin printers defined as two unsupported devices
- LINE LIP printers defined as standard 3211's
- LINE MOD2 printers defined as standard 3800 model 3's

Examples of the generation macros for these printers can be found in Figure 8, and in member SPSIIOG of SPS.SPSSAMP.

```
APA Single printer:
  CNTLUNIT  CUNUMBER=NNN, PATH=(PP), UNIT=DUMMY, UNITADD=((UU,1)), PROTOCL=S,    X
            SHARED=N
  IODEVICE  ADDRESS=XXX, CUNUMBR=NNN, UNIT=DUMMY

APA Twin printer:
  CNTLUNIT  CUNUMBER=NNN, PATH=(PP), UNIT=DUMMY, UNITADD=((UU,1)), PROTOCL=S,    X
            SHARED=N
  IODEVICE  ADDRESS=XXX, CUNUMBR=NNN, UNIT=DUMMY
  CNTLUNIT  CUNUMBER=MMM, PATH=(PP), UNIT=DUMMY, UNITADD=((TT,1)), PROTOCL=S,    X
            SHARED=N
  IODEVICE  ADDRESS=ZWW, CUNUMBR=MMM, UNIT=DUMMY

LINE LIP printer:
  CNTLUNIT  CUNUMBER=NNN, PATH=(PP), UNIT=3811, UNITADD=((UU,1)), PROTOCL=D,    X
            SHARED=N
  IODEVICE  ADDRESS=YYY, CUNUMBR=NNN, UNIT=3211

LINE MOD2 printer:
  CNTLUNIT  CUNUMBER=NNN, PATH=(PP), UNIT=3800, UNITADD=((UU,1)), PROTOCL=S,    X
            SHARED=N
  IODEVICE  ADDRESS=ZZZ, CUNUMBR=NNN, UNIT=3800, MODEL=3
```

Figure 8: Sample Generation Macros for Océ APA and LINE Printers

If the MVS system is running under VM, then all SPS APA and LIP printers can be generated in the VM system as unsupported devices. MOD2 printers should always be generated as 3800 model 3's. The only way to correctly generate an SPS APA printer in all MVS software environments is to specify UNIT=DUMMY. If you have the IBM product PSF installed in your system, you may also specify UNIT=AFP1 for an SPS printer, because the MVS support for UNIT=AFP1 is shipped with PSF. If you specify UNIT=AFP1 without having PSF installed, you may have unpredictable and severe errors like WAIT STATES during IPL. Procedures for generating SPS APA and LIP printers as VM supported 3835's or 3211's vary depending on the VM version and product. Please contact an Océ service representative for further information. For MOD2 printers running with the old HP controller, PROTOCL=D should be specified in the CNTLUNIT statement.

2.18 Definitions necessary for LU 6.2 network printers

If you have a network printer which is remotely controlled by SIEPRIS APA, PRISMA, PSF/2 or PSF/6000, you may use SPS/MVS to transfer print files from JES spool to the workstation spool. Before transmission, the print files are converted from SPDS to SNIPDS data stream.

In addition to the JES printer definitions, LU 6.2 printers must be defined in your VTAM/NCP configuration. You must define SPS as a VTAM application, each remote

printer must have its PU/LU definition in NCP and a logon mode table entry for SPS LU sessions must be provided.

The following figures are samples for the definitions.

```

MODSPS MODTAB

Logmode for remode attached printer

MODEENT LOGMODE=SPS,                                C
        FMPPROF=X'13',                               C
        TSPPROF=X'07',                               C
        PRIPROT=X'B0',                               C
        SECPROT=X'B0',                               C
        COMPROT=X'D0B1',                             C
        RUSIZES=X'B7B7', RUSIZE=1408 BYTES           C
        PSNDPAC=16,                                  C
        SRCPAC=16,                                   C
        SSNDPAC=0,                                   C
        COS=LOWCOS,                                  C
        PSERVIC='060200000000000000000002000'
    
```

Figure 9: Sample LOGMOD Entry

```

VBUILD TYPE=APPL
APPL Definition for remote attached printer

APPLSPS APPL AUTH=ACQ,                                C
        EAS=1,                                       C
        SONSCIP=NO,                                  C
        APPC=YES
    
```

Figure 10: Sample APPL Entry

Installation and Customization

```

VBUILD  TYPE=SWNET,                                c
         MAXGRP=2,                                  c
         MAXNO=2

* SNI Sample PU and LU definitions

P02OS2P  PU    ADDR=C1,                             c
          ANS=CONT,                                 c
          DISCNT=NO,                                c
          DLOGMODE=SNX32703,      MOD 3 WITH QUERY  c
          MODETAB=MOD3270,        MODETAB for 3270  c
          CPNAME=P02OS2P,                             c
          ISTATUS=ACTIVE,                             c
          MAXDATA=2048,                                c
          MAXPATH=1,                                  c
          MAXOUT=8,                                   c
          PACING=0,                                   c
          PUTYPE=2,                                   c
          SSCPFM=USSSCS,                              c
          USSTAB=USSSCS,                              c
          VPACING=0

*
          PATH  DIALNO=0004400011110010,            c
                GRPNM=G56TRN00      LOCAL ECL GROUP

*
T02OS2P0 LU    LOCADDR=2
T02OS2P1 LU    LOCADDR=3
T02OS2P2 LU    LOCADDR=4
T02OS2P3 LU    LOCADDR=5
T02OS2P4 LU    LOCADDR=6
T02OS2PP LU    LOCADDR=7,                             c
                PACING=16,                             c
                DLOGMODE=SPS,                           c
                MODETAB=MODSPS,

c
                SSCPFN=FSS,                             c
                USSTAB=ISTINCDT,                         c
                VPACING=16

```

Figure 11: Sample PU and LU definitions

You can find these samples in member SPSIVTAM in the SPSSAMP library.

See also the sample definition for an LU 6.2 printer in member SPSPRINT from SPSSAMP library.

2.19 Definitions necessary for LU1 network printers

You need the following definitions in VTAM in order to use an LU1 printer as SPS printer:

```

*
      VBUILD TYPE=APPL
*
*
APPLSPS  APPL  AUTH=ACQ,EAS=1,SONSCIP=NO
*
    
```

Figure 12: Sample APPL Entry

```

C3174V VBUILD  TYPE=LOCAL
*
PU3174V  PU      CUADDR=020,MAXBFRU=26,DELAY=0,PUTYPE=2, ISTATUS=ACTIVE,  X
          XID=YES
*
LU1PRT   LU      LOCADDR=24,          Printer address          X
          MODETAB=LU1MOD,           Logmode table used       X
          DLOGMOD=LU1LOG,           Default logmode          X
          USSTAB=ISTINCDT,          Default USSTAB          X
          SSCPFM=FSS,               X
          PACING=3,                 X
          VPACING=3                 X
*
    
```

Figure 13: Sample PU/LU definition in a local SNA major mode

```

*
LU1MOD   MODETAB
*
      MODEENT LOGMODE=LU1LOG,          X
          FMPROF=X'03',                X
          TSPROF=X'03',                X
          PRIPROT=X'B1',               X
          SECPROT=X'B0',               X
          COMPROT=X'7080',              X
          RUSIZES=X'8787',             X
          PSNDPAC=X'03',                X
          SRCVPAC=X'03',                X
          SSNDPAC=X'00',                X
          PSERVIC=X'014000010000000001000000', X
          COS=LOWCOS
*
*
      MODEEND
      END
    
```

Figure 14: Sample LOGMOD Entry

You can find these samples in member SPSIVTAM in the SPSSAMP library. See also the sample definition for an LU1 printer in member SPSPRINT from SPSSAMP library.

2.20 Define the SPS Printers to JES

Each SPS start-up procedure is one functional subsystem. The printers defined in the procedure are the printers that the functional subsystem controls. The SPS functional subsystems, and the printers they control, must be defined to the JES subsystem that the installation is using (JES2 or JES3). Any combination of APA single, APA twin, LIP and MOD2 printers may be controlled by one functional subsystem. Each APA single, APA twin, LIP and MOD2 printer is addressed by the functional subsystem as a single JES printer number. Twin printers may be split into two single printers. When operating in this mode, each of the printers must be defined to the JES subsystem as a separate printer number in addition to the printer definition representing the twin printer mode. These additional printer definitions make it possible for the operator to control the printers separately.

In both JES2 and JES3, each SPS start-up procedure is a functional subsystem and is defined in the JES initialization parameters by coding an FSSDEF statement. The printers are defined by coding PRT(nnnn) statements for JES2, or DEVICE statements for JES3. One PRT(nnnn) or DEVICE statement is coded for each APA single, APA twin, LIP or MOD2 printer defined to the functional subsystem.

As SPS uses four digits of the JES printer number for some naming conventions (like the trace file DD name) the biggest JES printer number used should be 9999 even if your JES system supports bigger numbers.

SPS APA and LIP printers must be coded as remote printers on PRT(nnnn) or DEVICE control statements. In JES2 SPS APA and LIP printers should be coded as remote printers (please see Figure 15 on page 45 for coding examples). In JES3 SPS APA and LIP printers should be defined as PRTAFP1 (please see Figure 16 on page 46 for coding examples). No device number parameter should be coded. If a device number is included in the PRT(nnnn) or DEVICE statement, SPS does not complete its initialization phase.

SPS MOD2 printers should be coded as normal locally attached 3800 model 3's on PRT(nnnn) or DEVICE control statements. All options appropriate to this printer type in the installation should be coded for SPS controlled MOD2 printers. Please see Figure 15 on page 45 for a JES2 example, and Figure 16 on page 46 for a JES3 example.

The FSSDEF statement contains the name by which the FSS is referenced in printer definition statements, and identifies the name of the procedure in proclib to be started when printers controlled by this FSS are started. It is recommended that the step name of the start-up task be used as the FSS name. This will make it easy to identify the FSS at the console.

In both JES2 and JES3, the printer definition statements identify the FSSDEF statement defining the FSS that controls them by referencing the FSS name. Océ printers should be defined to JES with the same parameters used in the installation for other printers of a

similar type, with the exception of the FCB and CHARS related parameters (please see section applicable to the installation JES).

2.20.1 JES2 FCB and CHARS Initialization Parameters

2.20.1.1 APA Printers

On APA printers the FCB field of the JCL is used to form a PAGEDEF name when none is supplied by the user. If no FCB or PAGEDEF is specified by a user in the JCL, JES2 will supply the system default coded in the JES2 FCB initialization parameter on the PRT(nnnn) statement. When this is not coded, an FCB may be supplied from the PRINTDEF statement in the FCB or NIFCB parameter. The default PAGEDEF for SPS APA printers can be specified in the SETUPxxx member in the PAGEDEF parameter. In order for this field to be used for print data sets, no value should be coded in the FCB or NIFCB JES2 initialization parameters. When JES2 initialization parameters specify an FCB, the PAGEDEF coded in SETUPxxx will only be used as the default for information pages (header, separator, message and trailer pages).

The JES2 CHARS initialization parameter for printers is the UCS parameter on the PRT(nnnn) statement. When this is not coded, a CHARS may be supplied from the PRINTDEF statement in the NIUCS parameter. When a value is supplied from one of these sources, JES2 provides it as the default CHARS name when no CHARS is specified by the user in the JCL. A default CHARS for SPS APA printers can be specified in the SETUPxxx member in the CHARS parameter. To use the SPS default for print files, UCS=0 should be coded in PRT(nnnn) statement of JES2 or the NIUCS parameter. The SPS default CHARS will always be used as the default for information pages. The UCS parameter on the PRT(nnnn) statement may be set to the default CHARS value specified in the SETUPxxx member. This specification will make the default CHARS the same in all printing situations.

The JES2 default NIUCS parameter, when not coded, is GF10. This is a folded character set. The SPS default CHARS in SETUPxxx, when not coded, is GT10 which is a full upper and lower case character set. If the installation does not have this character set, the value should be changed to a character set that is installed in the installation. Also the UCS parameter on the PRT(nnnn) statement should be changed to the value selected for CHARS in SETUPxxx so the default CHARS will be the same in all printing situations.

2.20.1.2 LINE Printers (LIP and MOD2)

The JES2 FCB initialization parameter for line printers is the FCB parameter on the PRT(nnnn) statement. When this is not coded, an FCB may be supplied from the PRINTDEF statement in either the FCB or NIFCB fields. JES2 provides either of these sources if coded as the default FCB name when no FCB is specified by a user in the JCL.

A default FCB for SPS LINE printers may be specified in the SETUPyyy and SETUPzzz members in the FCB parameter. In order for this field to be used, no values should be coded in the JES initialization parameters. If an FCB is coded in the JES initialization parameters, this FCB will be used as the default for all print data streams. The default FCB specified in SETUPyyy or SETUPzzz will be used as the default for information pages (header, separator, message and trailer pages).

The JES2 CHARS initialization parameter for printers is the UCS parameter on the PRT(nnnn) statement. When this is not coded a, CHARS may be supplied from the PRINTDEF statement in the NIUCS parameter. When a value is supplied from one of these sources, JES2 provides it as the default CHARS name when no CHARS is specified by the user in the JCL. This CHARS value is used to specify an initial font for LIP printers and default character set for MOD2 printers.

MOD2 printers have a default CHARS specified in the SETUPzzz member in the CHARS parameter. This default CHARS will never be used in JES2 for print data sets because JES2 will always supply one, but will always be used as the default for information pages. The UCS parameter on the PRT(nnnn) statement should be set to the default CHARS value specified in the SETUPzzz member. This setting will make the default CHARS the same in all printing situations.

The JES2 default NIUCS parameter, when not coded, is GF10. This is a folded character set. The SPS default CHARS for MOD2 printers, when not coded in SETUPzzz, is GT10 which is a full upper and lower case character set. If the installation does not have this character set, the value should be changed to a character set that is installed in the installation. The UCS parameter on the PRT(nnnn) statement should be changed to the value selected for CHARS in SETUPzzz, so the default CHARS will be the same in all printing situations.

For LIP printers the default CHARS supplied by JES2 is not a valid initial font number (00-128), so it is ignored and the initial font coded in the SETUPyyy member is used. An installation can code a valid initial font number in the JES2 initialization parameters UCS or NIUCS. If a valid initial font number is coded, it will override the INITFON parameter in SETUPyyy for print data sets. The initial font specified in the SETUPyyy member will be used for information pages. The use of different default initial fonts for print data streams and information pages is not recommended.

2.20.2 JES3 FCB and CHARS Initialization Parameters

2.20.2.1 APA Printers

On APA printers the FCB field of the JCL is used to form a PAGEDEF name when none is supplied by the user. If no FCB or PAGEDEF is specified by a user in the JCL, JES3 will supply the FCB from the CARRIAGE parameter in the JES3 initialization parameters on the DEVICE statement. When this is not coded, an FCB may be supplied from the

CARRIAGE parameter on the OUTSERV statement. When none is coded JES3 will supply the system default. The default PAGEDEF for SPS APA printers can be specified in the SETUPxxx member in the PAGEDEF parameter. This default PAGEDEF can never be used for print data sets because JES3 will always supply an FCB which will be used to construct a PAGEDEF name. In JES3 the SPS default PAGEDEF will only be used as the default for information pages (header, separator, message and trailer pages). The CARRIAGE parameter on the DEVICE statement should be set to the default PAGEDEF value specified in the SETUPxxx member. This setting will make the default PAGEDEF the same in all printing situations. This can only be done if the default PAGEDEF is limited to 4 characters because the carriage parameter only supports 4 characters for FCB names.

The JES3 CHARS initialization parameter for printers is the CHARS parameter on the DEVICE statement. When this is not coded, a CHARS may be supplied from the OUTSERV statement in the NIUCS parameter. When a value is supplied from one of these sources, JES3 provides it as the default CHARS name when no CHARS is specified by the user in the JCL. NIUCS always has a default value if not coded. A default CHARS for SPS APA printers can be specified in the SETUPxxx member in the CHARS parameter. This SPS CHARS parameter will never be used for print data sets because JES3 will always supply a CHARS value. In JES3 the CHARS parameter in SETUPxxx will only be used as the default for information pages (header, separator, message and trailer pages). The CHARS parameter on the DEVICE statement should be set to the default CHARS value specified in the SETUPxxx member. This setting will make the default CHARS the same in all printing situations.

The JES3 default CHARS parameter, when not coded, is GS10. The SPS default CHARS in SETUPxxx is GT10. If the installation does not have this character set, the value should be changed to a character set that is installed in the installation. The CHARS parameter on the DEVICE statement should be changed to the value selected for CHARS in SETUPxxx so the default CHARS will be the same in all printing situations.

2.20.2.2 LINE Printers (LIP and MOD2)

The JES3 FCB initialization parameter for line printers is the CARRIAGE parameter on the DEVICE statement. When this is not coded, an FCB is supplied from the CARRIAGE parameter on the OUTSERV statement. When no value is coded on either statement, JES3 will supply the system default. The default FCB for SPS LINE printers can be specified in the SETUPyyy or SETUPzzz members in the FCB parameter. This default FCB will never be used for print data set processing because JES3 always supplies an FCB name. In JES3 the SPS default FCB will only be used as the default for information pages (header, separator, message and trailer pages). The CARRIAGE parameter on the DEVICE statement should be set to the default FCB value specified in the SETUPyyy or SETUPzzz member. This setting will make the default FCB the same in all printing situations.

The JES3 CHARS initialization parameter for printers is the CHARS parameter on the DEVICE statement. When this is not coded, a CHARS may be supplied from the OUTSERV statement. When a value is supplied from one of these sources, JES3 provides it as the default CHARS name when no CHARS is specified by the user in the JCL. CHARS always has a default value if not coded. The CHARS value is used to specify an initial font for LIP printers and default character set for MOD2 printers. MOD2 printers use the JES3 default CHARS, when not supplied from other sources.

MOD2 printers have a default CHARS specified in the SETUPzzz member in the CHARS parameter. This default CHARS will never be used in JES3 for print data sets because JES3 will always supply one, but will always be used as the default for information pages. The CHARS parameter on the DEVICE statement should be set to the default CHARS value specified in the SETUPzzz member. This setting will make the default CHARS the same in all printing situations.

The JES3 default CHARS parameter, when not coded, is GS10. The SPS default CHARS for MOD2 printers in SETUPzzz is GT10. If the installation does not have this character set, the value should be changed to a character set that is installed in the installation. The CHARS parameter on the DEVICE statement should be changed to the value selected for CHARS in SETUPzzz so the default CHARS is the same in all printing situations.

For LIP printers the default CHARS supplied by JES3 is not a valid initial font number (00-128), so it is ignored and the initial font coded in the SETUPyyy member is used. An installation can code a valid initial font number in the JES3 initialization parameter CHARS. If a valid initial font number is coded, it will override the INITFON parameter in SETUPyyy for print data sets. The initial font specified in the SETUPyyy member will only be used for information pages. The use of different default initial fonts for print data streams and information pages is not recommended.

2.20.3 JES3 OUTSERV Statement Considerations

In JES3 systems, if an OUTSERV statement is included in the initialization deck and work selection criteria are specified ('WS=') on this statement, the 'U' and 'F' parameters must be specified as part of the work selection criteria. The 'U' parameter controls the use of character sets, or UCS, as a work selection criteria. The 'F' controls the use of the forms name as a work selection criteria. However, due to internal processing in JES3, if 'U' and 'F' are not specified, control file processing will not be performed. When the 'WS=' parameter is not specified, the defaults include 'U' and 'F'. When 'WS=' is specified, 'U' and 'F' will be considered not specified unless explicitly coded. If you have a JES3 version previous to 4, you should also specify 'CM' in the work selection criteria.

2.20.4 Examples of JES2 and JES3 Initialization Statements

An example of JES2 initialization statements may be found in Figure 15 on page 45 and member SPSIJES2 in SPS.SPSSAMP. An example of JES3 initialization statements may be found in Figure 16 on page 46 and member SPSIJES3 in SPS.SPSSAMP. In both figures one FSS is defined, named SPS1, that controls 4 SPS printers, one APA single, one APA twin, one LIP and one MOD2. The APA single printer is defined as printer 3, only to be driven by SPS. The APA twin is defined as printer 4 when run as a twin and as printers 5 and 6 when run in split mode as two singles under SPS. The LIP printer is defined as printer 7, when it is to be driven by SPS, as a LIP printer, and printer 8 when it is to be driven by JES as a 3211. The MOD2 printer is defined as printer 9, only to be driven by SPS.

Note that if JES3 is not going to drive the LIP printer as a 3211, this extra printer definition can be removed, but must be replaced by a statement defining it as an execution device:

```
DEVICE,XTYPE=(3211,UR),XUNIT=(ddd,cpu1,UR,ON)
```

Unless either a device statement defining the LIP printer as a JES3 controlled printer, or a device statement defining it as an execution device is included, JES3 may not be able to allocate the printer to SPS. For APA printers in JES3, an execution device statement must be included if JES3 directly drives any dummy defined devices (if the printer is defined as DUMMY to MVS). If the printer is defined as AFP1 to MVS, either another JES3/PSF printer should be defined (with its execution device) or an extra JES3 execution device should be defined. Missing execution device statements, when needed, will cause failure to allocate with messages indicating device is allocated to another job. If the execution device is defined offline, it can be set online with the command *V DDD,ON,SYSx. These examples are for JES2 or JES3 version 4.2. JES control statements vary depending on the JES version. Please refer to the JES Initialization and Tuning Guide that corresponds to the version of JES installed in your installation for the proper statement format for your JES.

```

FSSDEF (SPS1)   PROC=SPSIPROC

Single APA printer: FSA printer 3
PRT(3) CLASS=I,FSS=SPS1,TRKCELL=YES,UCS=GT10,MODE=FSS,
ROUTECDE=LOCAL,PRMODE=(LINE,PAGE),START=NO,SEPDS=YES,
CKPTPAGE=20,MARK=YES

Twin APA printer: FSA printer 4
PRT(4) CLASS=Z,FSS=SPS1,TRKCELL=YES,UCS=GT10,MODE=FSS,
ROUTECDE=LOCAL,PRMODE=(LINE,PAGE),START=NO,SEPDS=YES,
CKPTPAGE=20,MARK=YES

Twin as two singles: FSA printer 5 and FSA printer 6
PRT(5) CLASS=I,FSS=SPS1, /* Primary address */
TRKCELL=YES,UCS=GT10,MODE=FSS,ROUTECDE=LOCAL,
PRMODE=(LINE,PAGE),START=NO,SEPDS=YES,
CKPTPAGE=20,MARK=YES
PRT(6) CLASS=I,FSS=SPS1, /* Secondary address */
TRKCELL=YES,UCS=GT10,MODE=FSS,ROUTECDE=LOCAL,
PRMODE=(LINE,PAGE),START=NO,SEPDS=YES,
CKPTPAGE=20,MARK=YES

LIP printer: FSA printer 7
PRT(7) CLASS=L,FSS=SPS1,MODE=FSS,ROUTECDE=LOCAL,START=NO,
PRMODE=LINE,SEPDS=YES,CKPTPAGE=20,MARK=YES

LIP printer run as 3211 by JES: FSA printer 8
PRT(8) CLASS=A,FCB=6,MODE=JES,UCS=T11,START=NO,
PRMODE=LINE,SEPDS=YES,CKPTPAGE=20,MARK=YES,UNIT=7A3

MOD2 printer: FSA printer 9
PRT(9) CLASS=M,FSS=SPS1,MODE=FSS,ROUTECDE=LOCAL,START=NO,
PRMODE=LINE,SEPDS=YES,CKPTPAGE=20,MARK=YES,UNIT=7A4

```

Figure 15: Sample JES2 Initialization Statements for Océ Printers

```

FSS definition:
FSSDEF,TYPE=WTR,FSSNAME=SPS1,PNAME=SPSIPROC,SYSTEM=4381

Single APA printer: FSA printer 3
DEVICE,DTYPE=PRTAFP1,JNAME=PRT3, X
CHARS=(YES,GT10),JUNIT=(,4381,UR,OFF),FSSNAME=SPS1, X
MODE=FSS,PM=(LINE,PAGE),WS=(D,T,F,C,U,CL,P,PM)

Twin APA printer: FSA printer 4
DEVICE,DTYPE=PRTAFP1,JNAME=PRT4, X
CHARS=(YES,GT10),JUNIT=(,4381,UR,OFF),FSSNAME=SPS1, X
MODE=FSS,PM=(LINE,PAGE),WS=(D,T,F,C,U,CL,P,PM)

```

```

Twin APA printer in split mode: FSA printers 5 and 6
  DEVICE,DTYPE=PRTAFP1,JNAME=PRT5, /* Primary address */           X
  CHARS=(YES,GT10),JUNIT=(,4381,UR,OFF),FSSNAME=SPS1,             X
  MODE=FSS,PM=(LINE,PAGE),WS=(D,T,F,C,U,CL,P,PM)
  DEVICE,DTYPE=PRTAFP1,JNAME=PRT6, /* Secondary address */       X
  CHARS=(YES,GT10),JUNIT=(,4381,UR,OFF),FSSNAME=SPS1,             X
  MODE=FSS,PM=(LINE,PAGE),WS=(D,T,F,C,U,CL,P,PM)

LIP printer driven by SPS: FSA printer 7
  DEVICE,DTYPE=PRTAFP1,JNAME=PRT7,JUNIT=(,4381,UR,OFF),           X
  CARRIAGE=(YES,6),FSSNAME=SPS1,PM=LINE,MODE=FSS,                 X
  WS=(D,T,F,C,U,CL,P,PM)

LIP printer driven as 3211 by JES3: JES printer 8
  DEVICE,DTYPE=PRT3211,JNAME=PRT8,TRAIN=(YES,T11),                X
  JUNIT=(7A3,4381,UR,OFF),CARRIAGE=(YES,6),PM=LINE,              X
  XTYPE=(3211,UR),XUNIT=(7A3,4381,UR,ON),                          X
  WS=(D,T,F,C,U,CL,P,PM)

MOD2 printer driven as 3800-3 by SPS: JES printer 9
  DEVICE,DTYPE=PRT38003,JNAME=PRT9,FSSNAME=SPS1,MODE=FSS,         X
  JUNIT=(7A4,4381,UR,OFF),PM=LINE,                                  X
  XTYPE=(3800,UR),XUNIT=(7A4,4381,UR,ON),                          X
  WS=(D,T,F,C,U,CL,P,PM)

```

Figure 16: Sample JES3 Initialization Statements for Océ Printers

2.21 Install the SPS Start-up Procedure

Start-up procedures to control the SPS driven printers must be defined and placed in the installation proclib. For a detailed description of SPS start-up procedures please refer to "SPS Start-up Procedures" on page 57. A step by step procedure for writing the start-up procedures can be found in "Coding the Start-up Procedure" on page 68. Figure 17 on page 48 is a model start-up procedure illustrating the coding for one APA (either single or twin), one LIP and one MOD2 printer. This model can also be found in SPS.SPSSAMP in member name SPSIPROC.

Installation and Customization

```
//* SPS: MODEL START UP PROCEDURE FOR 3 PRINTERS
//*      JES PRT4: 7A1 (APA)
//*      JES PRT7: 7A3 (LIP)
//*      JES PRT9: 7A4 (MOD2)
//*
//SPS1   PROC PREFIX=SPS
//SPS1   EXEC PGM=SPSMFSS,TIME=1440,REGION=1M
//*
//*      PROCEDURE ORIENTED DATA SETS:
//*
//STEPLIB DD DSN=&PREFIX..SPSLINK,DISP=SHR
//SYSUDUMP DD SYSOUT=A
//SPSMGDD DD DSN=&PREFIX..SPSMESS(ENGLISH),DISP=SHR
//        DD DSN=&PREFIX..SPSMESS(ENGLISH0),DISP=SHR
//        DD DSN=&PREFIX..SPSMESS(ENGLISH1),DISP=SHR
//        DD DSN=&PREFIX..SPSMESS(ENGLISH2),DISP=SHR
//SPSPARM DD DSN=&PREFIX..SPSPARM,DISP=SHR
//*
//*      OUTPUT FOR RESLIST(YES) FUNCTION FROM SETUPXXX
//*
//SPSR0004 DD SYSOUT=R
//*
//*      OUTPUT FOR SPOOLMSG(YES) FUNCTION FROM SETUPXXX/CNT FILE
//*
//SPSO0004 OUTPUT CLASS=O
//*
//*      JES COMMON OBJECT CONTAINER LIBRARY DEFAULT WHEN NOT
//*      NOT SPECIFIED IN SETUPXXX/CNT FILE
//*
//*      SEE JES PRT4 BELOW FOR ALTERNATIVE OBJECT CONTAINER USE
//*      OBJCONDD(OBJ240) WOULD BE SPECIFIED IN THE SETUPXXX
//*      MEMBER FOR THIS PRINTER.
//*      ALL OTHER PRINTER SETUP MEMBERS WOULD HAVE NO OBJCONDD
//*      ENTRY AND WOULD THEREFORE SHARE THE COMMON OBJCON.
//*
//OBJCON  DD DSN=&PREFIX..SPSOBJC,DISP=SHR
//*
//*      JES PRT4: 7A1 APA LIBRARIES FOR 240 DPI
//*
//FORMDEF DD DSN=&PREFIX..SPSFD24,DISP=SHR
//PAGEDEF DD DSN=&PREFIX..SPSPD24,DISP=SHR
//PAGESEG DD DSN=&PREFIX..SPSPS24,DISP=SHR
//OVERLAY DD DSN=&PREFIX..SPSOL24,DISP=SHR
//FONT    DD DSN=&PREFIX..SPSFO24,DISP=SHR
//*
//*      APA LIBRARIES FOR 300 DPI (FIXED METRICS)
//*
//SPSFD30 DD DSN=&PREFIX..SPSFD30,DISP=SHR
//SPSPD30 DD DSN=&PREFIX..SPSPD30,DISP=SHR
//SPSOL30 DD DSN=&PREFIX..SPSOL30,DISP=SHR
//SPSPS30 DD DSN=&PREFIX..SPSPS30,DISP=SHR
//SPSFO30 DD DSN=&PREFIX..SPSFO30,DISP=SHR
//*
//*      APA LIBRARIES FOR 300 DPI (RELATIVE METRICS)
//*
//SPSFO3R DD DSN=&PREFIX..SPSFO3R,DISP=SHR
```



```

//SPSPD3R DD DSN=&PREFIX..SPSPD3R,DISP=SHR
//SPSOL3R DD DSN=&PREFIX..SPSOL3R,DISP=SHR
//SPSPS3R DD DSN=&PREFIX..SPSPS3R,DISP=SHR
//*
//*
//*          APA LIBRARIES FOR 600 DPI
//*
//SPSFD60 DD DSN=&PREFIX..SPSFD60,DISP=SHR
//SPSPD60 DD DSN=&PREFIX..SPSPD60,DISP=SHR
//SPSOL60 DD DSN=&PREFIX..SPSOL60,DISP=SHR
//SPSPS60 DD DSN=&PREFIX..SPSPS60,DISP=SHR
//SPSFO60 DD DSN=&PREFIX..SPSFO60,DISP=SHR
//*
//* JES PRT4: 7A1 (APA) NEED ONLY IF TWIN PRINTER:
//*      (1) OUTPUT STATEMENT FOR TWINMSG (NONPRO)
//*      (2) EXTERNAL STORAGE DATA SET (OPTIONAL)
//*
//SPSM0004 OUTPUT CLASS=M
//SPSW0004 DD DSN=&PREFIX..ESD0004,DISP=OLD
//*
//* JES PRT4: 7A1 (APA) DIAGNOSTIC DATA SETS:
//*
//SPS10004 DD DSN=&PREFIX..TRA10004,DISP=SHR,DCB=(BUFNO=20)
//SPS20004 DD DSN=&PREFIX..TRA20004,DISP=SHR,DCB=(BUFNO=20)
//*
//* JES PRT7: 7A3 LIP DIAGNOSTIC DATA SETS:
//*
//SPS10007 DD DSN=&PREFIX..TRA10007,DISP=SHR
//SPS20007 DD DSN=&PREFIX..TRA20007,DISP=SHR

//*
//* JES PRT9: 7A4 MOD2 DIAGNOSTIC DATA SETS:
//*
//SPS10009 DD DSN=&PREFIX..TRA10009,DISP=SHR
//SPS20009 DD DSN=&PREFIX..TRA20009,DISP=SHR

```

Figure 17: Model Start-up Procedure

2.22 Allocate the SPS Execution Libraries

The SPS execution data sets defined in the start-up procedures must be allocated. Table 8 shows the suggested data set allocation parameters. A sample allocation for the dump data set is shown in the event the installation prefers a dump data set to a file. It is suggested that the trace data set suffix *jjjj* be the number of the JES printer expanded to 4 digits (*jjjj* in SPSIEXDS sample) and the dump data set suffix *ssss* be the start-up procedure step name (see "Data Set Names" on page 59). When twin printers are installed, an external storage data set may be optionally used. It is suggested that the suffix for this data set be the number of the JES printer expanded to 4 digits (*jjjj* in SPSIEXDS sample). A model allocation job for the SPS execution data sets can be found in member SPSIEXDS of SPS.SPSSAMP. This job also copies the SPSPARM sample members from the SPSSAMP to the SPSPARM library. Please customize the iebcopy control statements in order to copy only the members needed for the printer types that you have (APA, LIP or MOD2).

DATA SET	RECFM	LRECL	BLKSIZE	BLOCKS	DIR	DISP
SPS.SPSPARM	FB	80	3120	100,50	15	SHR
SPS.TRA1jjjj	VB	284	4096	3000,0	-	SHR
SPS.TRA2jjjj	VB	284	4096	3000,0	-	SHR
SPS.DUMPssss	VB	125	1632	660,330	-	MOD
SPS.ESDjjjj	F	8192	8192	3000,0	-	OLD

Table 8: SPS Execution Data Set Allocations

2.23 Create the SPS Parameter Library Members

Each time a printer is started, SPS accesses several members of SPS.SPSPARM to determine the installation selected printer defaults and options. These members must be coded for each printer and moved to SPS.SPSPARM. This job is usually performed by the SPS administrator, because it requires a knowledge of SPS processing options and how the installation is planning on using the product.

The SPS parameter library members need not be coded before completing the installation of SPS. If the installer is also going to code these members, the *SPS/MVS-APA*, *SPS/MVS-LIP* or the *SPS/MVS-MOD2 Administrator's Guide* should be consulted for an overview of SPS processing and details on coding the parameters.

The delivered SPSPARM sample members are copied from the SPSSAMP to the SPSPARM when the installation job SPSIEXDS is executed. You may use these samples as a base for your SPSPARM member coding.

2.24 Allocate the Control Data Sets

Control data sets are optional for both APA and LINE printers. The allocation of the required control data sets is usually performed by the SPS administrator, because it requires a knowledge of how the installation is planning on using the product, which user groups will be established, how many data sets will be required for the groups and what will be their names. If it is the responsibility of the installer to allocate these data sets, the SPS administrator should provide the installer a list of the data sets required. It is not necessary to allocate the control data sets to complete the installation and installation test.

If the installer is allocating the control data sets, the size requirements must be determined. The size of a control data set depends on how many members are desired. Table 9 shows model allocation parameters for a control data set. A sample control data set allocation job, that may be modified to suit installation requirements, can be found in member SPSICTDS of SPS.SPSSAMP.

DATA SET	RECFM	LRECL	BLKSIZE	BLOCKS	DIR
SPS.CTLcccc	FB	80	3120	100,10	80

Table 9: SPS Control Data Set Allocation

2.25 Define SPS Start-up Procedures and Data Sets to RACF

If the installation has RACF or some other security product that controls access to the system and resources, the SPS start-up procedures and data sets will have to be defined to this product. This manual only discusses RACF requirements, for other security products please consult the product's documentation.

There are several approaches that an installation may have implemented to handle started tasks and system data sets under RACF. SPS has no special requirements or restrictions, so it may be defined to RACF using whatever scheme an installation has chosen. The important considerations are:

1. Each SPS start-up procedure must be defined as a started task, valid for execution in the system.
2. Each SPS data set or library must be protected against unauthorized change.
3. Each SPS started task must be authorized to use the SPS data sets defined in its start-up procedure.
4. Each SPS started task must be authorized to use any control data sets defined in its control key data set list member of SPS.SPSPARM.
5. Each control data set user must be authorized to update the assigned control data set.

For a full discussion of defining SPS to RACF please see "RACF Considerations" on page 66.

2.26 Test the SPS Installation

2.26.1 Testing APA, LIP or MOD2 Installation When No Printer is Available

The basic SPS APA (single or twin), LIP or MOD2 installation, the SPS initialization parameters and the form control files can be verified without having the defined printer available. To run this testing procedure:

1. Make the changes to the start-up procedure and SPSPRINT member of SPS.SPSSAMP in order to define your printer.
2. Start the defined printer with no work in the output class defined to the printer to be tested (\$SPRTn or *V,PRTn,ON).

A complete SPS APA, LIP or MOD2 initialization will be performed. All JES FSS and FSA parameters, initialization parameters and forms control file parameters will be verified before the printer is allocated. After all initialization parameters are verified, the

SPS start-up procedure will go through allocation recovery for the physical device. The SPS allocation recovery messages SPS0210A and SPS0209A will be displayed on the console.

3. Reply 'N' to message SPS0209A.

This reply will test termination processing. SPS/MVS will terminate with a dump to the ddname SYSUDUMP or SYSABEND in the start-up procedure. The user completion code will be 0205.

4. Check the system log for any warnings or errors other than the allocation recovery messages.
5. Check the SYSUDUMP or SYSABEND data set or output to verify the dump was taken.

This testing method only works if the printer is defined in the I/O generation or the MVS configuration program run (whichever is used for the installation operating system level). Using this capability permits the verification of an SPS installation prior to printer delivery, or checking SPS parameter modifications without impacting production.

2.26.2 Testing APA Installation with an Available Printer

You may run job SPSISIVP from the SPSSAMP library in order to verify if SPS was properly installed. Some installation related updates should be done in this job, as specified in the job itself.

This IVP is prepared for twin printers but can also be used for single fan-fold and cut-sheet printers.

The page length and width settings on the printer must be set properly, and the printers must be in REVERSE mode. For SPS, the operator should always specify UP-MODE as NO 2-UP on the operator panel. The application may be printed on 12" x 8,5", 9,5" x 11" or bigger form sizes. The printer will automatically adjust to the paper size, altering the print orientation to fit on the form as a letter size document, assuming the operator panel settings correctly correspond to the paper size.

Please select the JCL step corresponding to the DPI of your printer.

2.26.3 Testing Hints

SPS is very forgiving and in most situations will ignore invalid specifications and use predefined defaults that permit continuing. However, warning messages will always be issued. Any invalid input parameters should be corrected until no more warning messages are issued and a test print job output is satisfactory.

2.27 ACCEPT the Product

A new release of SPS should be allowed to run for a reasonable period of time in production before doing an SMP accept. When the installation is confident that all print jobs supported by the previous release of SPS run without problems on the new release, SPS should be accepted. Also a good approach is to accept old sysmods when new sysmods are to be applied.

```
//ACCEPT JOB 'ACCOUNT #', 'NAME', MSGLEVEL=(1,1)
//ACCEPT EXEC SMPPROC
//SMP.SYSIN DD *                               (SMPCNTL)
        SET BDY(SPSvrmD) .
        ACCEPT S(SPSvrm0) .
/*
```

Figure 18: Sample SMP Accept Job (SPSISAC0)

The model job in Figure 18 can be modified to suit installation requirements and used to accept the SPS base product, any requested drivers and any optionally installed standard resources FMIDs. The fmid's in the figure should be changed to the drivers ordered.⁴ If only one of the SPS drivers has been ordered, the accept card should be changed to include only the fmid's that are to be installed. Model accept jobs tailored to the ordered fmid are shipped with each fmid in their SPS.fmid.F3 libraries in member names SPSISAC0, SPSISAC1 and SPSISAC2 respectively.

⁴ Where **v** is the version, **r** is the release and **m** is the modification level of the delivered version.

3 SPS Start-up Procedures

SPS runs in an address space as a started task. This started task is an FSS (see "SPS Processing Overview" on page 1 for a full description). A started task must have a start-up procedure in one of the installation proclibs. This procedure defines the name of the program to be run and its associated data sets. In the case of an FSS, there are up to 15 printer controlling subtasks attached by the FSS started task. Each printer subtask requires access to the data sets associated with the printer (single or twin) it controls. These data sets are either defined in the start-up procedure or dynamically allocated. A single start-up procedure may support any combination of the printer types supported by SPS. SPSIPROC. In SPS.SPSSAMP is a sample procedure that illustrates coding for all SPS supported printers.

3.1 How Many SPS Procedures Are Required

Each start-up procedure is architecturally capable of driving 15 single or twin printers. The only limitation factor on having many printers per SPS procedure is the dynamic storage used for each printer. Please see "Memory" on page 71 for storage estimations related to your printer type.

3.2 Virtual and Real Storage Considerations

SPS is re-entrant with the exception of its data areas. When only one SPS printer is supported in an installation, only a single copy of SPS will ever be in virtual storage. When multiple SPS driven printers are supported, multiple copies of SPS will be loaded into virtual storage, when more than one start-up procedure is used. Each of these copies will be backed by different real storage, if the normal installation procedure is followed (STEPLIB or LINKLIB installation) and one start-up procedure is defined for each printer. This duplication can be avoided by directing the link-edits of re-entrant SPS modules to LPALIB (please see "Adjust JCLIN for LPALIB installation" on page 32 for how to perform this function).

When the SPS re-entrant modules are moved or copied to LPALIB there will be no additional virtual or real storage required for multiple copies due to multiple start-up procedures.

3.3 Naming Considerations

3.3.1 Start-up Procedure Member Name

Any convenient member names may be chosen. Choosing a common prefix mnemonic for all procedures will make it simpler to identify SPS started tasks at an operator console.

3.3.2 Start-up Procedure Stepname

The stepname may be used by the operator when he wishes to enter MVS commands referencing an SPS procedure. It is recommended that the stepname for SPS be limited to 4 characters of which the first 3 are a common mnemonic and the last character is an identifier of the procedure (0-9 or A-Z). This name must be unique for each procedure to provide access to the procedure for MVS operator commands. In the model start-up procedure the mnemonic SPS has been used (see Figure 17 on page 48). Using a printer address, or JES printer name, is not advisable. Each started task may control more than one printer. The limit of 4 characters is suggested because it is convenient to use the stepname as a suffix to the dump data set name associated with this procedure. Each procedure should have a unique SYSUDUMP or SYSABEND dump data set name, if sysout is not to be used for the dump data set (see Figure 17 on page 48).

3.3.3 Ddnames

SPS allocates the data sets defined in the start-up procedure by ddname. Ddnames for printer resource libraries are defined by the systems programmer in the setup member for each printer. The ddnames of the trace files must be of the form SPS1nnnn and SPS2nnnn, where *nnnn* is the JES printer number expanded to 4 digits (for PRT4 would be SPS10004 and SPS20004). The ddname for the twin printer external storage data sets must also be of the form SPSWnnnn, where *nnnn* is the JES printer number expanded to 4 digits (for PRT4 would be SPSW0004). It is suggested for clarity that the name of the twin printer external storage data set also contains the JES printer number.

3.3.4 Data Set Names

Since all data sets are allocated by ddname, the systems programmer may choose any data set names that meet the standards of the installation. It is recommended that all SPS data sets, with the possible exception of resource libraries, be given a common first level index. The primary index SPS has been used in all the model installation jobs. Printer oriented data sets should be given names that identify the JES printer to which they belong. In the sample start-up procedure SPSIPROC, the JES printer number has been used as the suffix to the trace data set names belonging to that printer (see Figure 17 on page 48).

When sysout will not be used for abnormal termination dumps, abnormal termination data sets must be allocated. The abnormal termination data sets must be different for each start-up procedure. In order to identify which start-up procedure a dump data set belongs to, it is suggested that some part of the data set name identify the start-up procedure. A part of the start-up procedure member name or stepname could be used for this purpose.

3.4 SPS Execution Data Sets

The execution data sets required by SPS depend on the printers installed and the execution options chosen. SPS requires start-up procedure oriented and printer oriented data sets. Start-up procedure data sets have one allocation of each type in the procedure. Printer data sets have one allocation of each type for each printer.

Every procedure requires a message library, a parameter library and may need a steplib and dump data set. The libraries may be shared between procedures, but the dump data set must be unique. Each printer may optionally have resource libraries and trace data sets. The resource libraries may be shared between printers and across procedures. The trace data sets must be unique for each printer.

Many of the data sets are optional, depending on the SPS options chosen by the installation. For instance, LINE printers do not require resource libraries (form definitions, page definitions, page segments, overlays and fonts), APA printers do require these libraries. User trace data sets are recommended for each printer. However, if the data sets are not present, the trace function will be suppressed and SPS will run normally. An abnormal termination dump data set is not required. However if the data set is provided, abnormal termination dumps will be written to this data set instead of SYSOUT.

SPS Start-up Procedures

DDNAME	OPT/REQ	ACCESS	DESCRIPTION
STEPLIB	OPT	R	<p>The load library containing the SPS load modules. This library should be shared between all SPS start-up procedures.</p> <p>This DD is only required if the SPS load library (including information page load modules) is not part of lpalib and/or linklst. An installation using only a steplib is the simplest installation approach.</p>
SYSUDUMP or SYSABEND	OPT	R/W	<p>The ddname for any abnormal termination dumps for a single SPS start-up procedure. SYSOUT is recommended for abnormal termination dumps, however adequate spool space must be available.</p> <p>An installation allocated data set may be used by the installation instead of the spool. This data set must be unique for all start-up procedures and must be specified with a disposition of MOD or dumps may be overwritten.</p> <p>The alternate ddname SYSABEND may be used if this is more convenient to the installation dump parameter definitions in SYS1.PARMLIB.</p>
SPSMGDD	REQ	R	<p>This DD is a concatenation of the message data set members for the products installed. Up to 4 members may be selected: the base product messages, the SPS sort messages, APA printer messages, and LINE printer messages. Different languages may be selected by member name if ordered. The message library should be shared between all start-up procedures. The message file is read from this file into storage when the SPS procedure is started. The same copy is used by all printers under the same procedure.</p>
SPSPARM	REQ	R	<p>The data set containing the SPS initialization parameter members. These members define the printers controlled by SPS and their processing options. This library should be shared between all start-up procedures. Please see <i>SPS/MVS-APA</i>, <i>SPS/MVS-LIP</i>, or <i>SPS/MVS-MOD2 Administrator's Guide</i> for further information on these members.</p> <p>Only one parameter library is required for an installation, however if an installation prefers to have one for each start-up procedure, this is possible. Use of the naming conventions recommended in this manual make it more convenient to have only one SPS parameter library.</p>

Table 10: SPS Procedure Oriented DDNAME Descriptions

DDNAME	OPT/REQ	ACCESS	DESCRIPTION
<p>formdef pagedef pageseg overlay font objcon</p>	OPT	R	<p>The libraries containing the formdef, pagedef, page segment, overlay, and font resources for an APA printer. These ddnames are defined by the SPS administrator in the setup member for the printer (please see <i>SPS/MVS-APA Administrator's Guide</i> for setup member coding).</p> <p>Library ddnames are only used by APA printers. There may be one full set of these libraries for each APA printer, however two or more printers may use the same ddname (DD statement) to reference a shared library. A printer may share some libraries with other printers and have some libraries defined uniquely. The libraries these ddnames reference may be shared by all SPS procedures.</p> <p>Four sets of APA libraries are delivered with SPS/MVS-APA and may be optionally installed. One set is for 240 dpi, the second is for 300 dpi (with fixed metric fonts), the third is for 300 dpi (with relative metric fonts) and the last one is for 600 dpi. The sample SPS procedures SPSIPROC and SPSDINC identify all sets which may be changed by the installation.</p>
<p>SPS1nnnn and SPS2nnnn</p>	OPT	R/W	<p>The data sets used to collect diagnostic trace information generated by SPS, where <i>nnnn</i> in the ddname is the number of the JES printer expanded to 4 digits. Both these ddnames must be present if either one is specified. Trace output alternates between each data set, overwriting the oldest entries.</p> <p>Trace data sets are only required if the option TRACEFILE(USER) is selected (please see <i>SPS/MVS-APA, SPS/MVS-LIP, or SPS/MVS-MOD2 Administrator's Guide</i> for details on trace parameters).</p> <p>The BUFNO subparameter from the DCB parameter may be increased (defaults to 5) to avoid start-stops together with tracing (see "Trace Files" on page 73).</p>

SPS Start-up Procedures

DDNAME	OPT/REQ	ACCESS	DESCRIPTION
SPS1nnnn and SPS2nnnn	OPT	R/W	<p>The data sets used to collect diagnostic trace information generated by SPS, where <i>nnnn</i> in the ddname is the number of the JES printer expanded to 4 digits. Both these ddnames must be present if either one is specified. Trace output alternates between each data set, overwriting the oldest entries.</p> <p>Trace data sets are only required if the option TRACEFILE(USER) is selected (please see <i>SPS/MVS-APA</i>, <i>SPS/MVS-LIP</i>, or <i>SPS/MVS-MOD2 Administrator's Guide</i> for details on trace parameters).</p> <p>The BUFNO subparameter from the DCB parameter may be increased (defaults to 5) to avoid start-stops together with tracing (see "Trace Files" on page 73).</p>
SPSWnnnn	OPT	R/W	<p>The data set used as a buffer for the output to the second printer in a twin printer configuration, where <i>nnnn</i> in the ddname is the number of the JES printer expanded to 4 digits. This buffer holds the second side of the printout when the memory allocated to SPS is insufficient to hold the printout in storage. If this DD is not present in the procedure SPS will use only its internal FIFO buffer for it (see NDFBUFL parameter from SETUPxxx) and will abend if this buffer is not big enough.</p>
SPSMnnnn	OPT	R/W	<p>This output statement specifies the characteristics of a dynamically allocated DD statement which is used for twin printers when TWINMSG(SNONPRO) is specified in the SETUPxxx member. When messages are issued for the message page of a print file after the message page itself has already been printed, then SPS writes all messages to this dynamically allocated file and spins it off. <i>nnnn</i> is the number of the JES printer expanded to 4 digits.</p>
SPSRnnnn	OPT	R/W	<p>This DD statement is used when RESLIST(YES) is specified in the SETUPxxx member from the SPSPARM library. SPS writes a resource usage report to this file containing all used resources and its respective libraries. <i>nnnn</i> is the number of the JES printer expanded to 4 digits.</p>

DDNAME	OPT/REQ	ACCESS	DESCRIPTION
SPSO n	OPT	R/W	This output statement specifies the characteristics of a dynamically allocated DD statement which is used when SPOOLMSG(YES) is specified in the SETUP xxx member from the SPSPARM library or in a control file. SPS writes and spins off the normal message page of the printing file to this DD statement instead of printing the message page at the printer. n is the number of the JES printer expanded to 4 digits.

Table 11: SPS Printer Oriented DDNAME and OUTPUT statement descriptions

The procedure oriented ddname descriptions in Table 10 on page 60, and printer oriented ddname descriptions in Table 11 will help in deciding which data sets are required by an installation. Figure 17 on page 48 shows a sample start-up procedure with the data sets recommended for three printers, an APA, LIP, and MOD2. This start-up procedure may be found in SPSIPROC of SPS.SPSSAMP with comments containing detailed explanations of each statement.

3.5 Execution Data Set Allocations

Table 8 on page 50 provides suggested minimum allocations for SPS execution data sets. The sample dump data set allocation (only needed if dumps are not directed to sysout) assumes that on-line volumes can satisfy secondary extent requests.

The trace data set sizes are based on the following assumptions:

1. A level 3 trace request (see TRACELEV parameter in *SPS/MVS-APA*, *SPS/MVS-LIP*, or *SPS/MVS-MOD2 Administrator's Guide*)
2. The problem being traced can be readily identified at the console
3. SPS can be cancelled within a short time of the problem's occurrence

If any of these assumptions is not the case, then considerably larger trace data sets may be required. The SPS trace data sets should not have secondary extents.

A model allocation deck for the execution data sets may be found in SPSIEXDS. All examples and models use the suggested naming conventions.

3.6 Twin Printer OUTPUT Statement

The twin printer has two print stations, one for each side of the paper. The second print station is several pages behind the first print station, depending on paper size and physical printer configuration. This means that unless a non-process run out (NPRO) is performed after each print data set and before the message and trailer pages are printed, it is possible for all front sides of a job to print, including the message and trailer pages while up to 32 back sides have not yet been printed. In this situation if messages concerning the back sides are issued they will not appear in the message pages because the message pages have already been printed at the first print station. An NPRO can be requested after each data set. This allows all messages to be printed, but wastes 32 pages of paper for each print data set.

The TWINMSG(SNONPRO) option in SETUPxxx provides an option to reprint the messages for a job after the job is over. The messages will be reprinted only if messages are issued after print message page processing. Such messages are too late to be included in the original message page(s). This reprint will include all the messages for the job including messages printed during print message page processing. This option requires an OUTPUT statement for the printer in the start-up procedure describing the characteristics of the print data set to be generated for the messages. Any of the applicable OUTPUT parameters may be specified, such as output class, form name, routing destination, etc. When the output class is the same as the print data set and no special routing is requested, the message data set will be reprinted as soon after the job output as possible. Please see TWINMSG(S) parameter in *SPS/MVS-APA Administrator's Guide* for more information on this option.

The OUTPUT statement must have a name of the form SPSMnnnn where *nnnn* is the JES printer number expanded to 4 digits (PRT4 would be SPSM0004). An example of this OUTPUT statement defining sysout class W is shown in Figure 17 on page 48.

3.7 RACF Considerations

RACF requires that started tasks be authorized the use of resources unless they are universal access resources. SPS libraries should, at most, be read only to the general user. SPS dump and trace data sets should be inaccessible to the general user, because they may contain sensitive information from user printouts. SPS control files must be updateable by the users that are defined to the particular control data set.

3.7.1 SPS Started Task Authorization

An installation may have started task procedures defined in load module ICHRIN03 of SYS1.LPALIB, or more commonly, have a started task procedure group in which all started tasks are defined as users. If ICHRIN03 is maintained, all SPS start-up procedures should be added to the table. If a started procedure group has been defined then SPS procedures should be added as users. The use of ICHRIN03 requires a re-ipl of the system, a started task procedure group technique does not.

3.7.2 SPS Data Set Authorization

The simplest way to control SPS data sets is to assign them all a unique first level index and define a RACF generic profile for this index. This assignment permits the addition and deletion of all SPS data sets without additional RACF changes. This generic should be assigned a universal access code of none. All SPS start-up procedures should be authorized update access to this generic because they need to read the libraries and update the trace and possibly dump data sets. All control data sets should use the SPS primary index, but should be defined as a subgeneric of the SPS generic. All SPS start-up procedures should be assigned to this subgeneric with access read because they need to read the control files. Users and/or user groups of a control data set should be assigned update access to that control data set.

If ICHRIN03 is used to control started tasks, the SPS procedures can be authorized to all SPS data sets by giving the privileged attribute. If the started task procedure group technique has been used and the started task group has the special attribute it is not necessary to authorize the SPS started tasks to the SPS generic and subgeneric profiles.

3.7.3 Sample Procedure for Defining SPS to RACF

Using the naming conventions suggested in this document, the above RACF definitions for a started task group, which does not have the special attribute, would translate to:

1. Define all SPS procedures to the started task group in the installation.
2. Define SPS.* as the SPS primary index generic for all SPS data sets.

3. Define all SPS start-up procedures to SPS.* with update authority.
4. Define SPS.CTL* as the subgeneric for control files.
5. Define all start-up procedures to SPS.CTL* with update authority.
6. Define all users or user groups to the particular SPS.CTLcccc data set they are permitted to use with update authority.

The above procedure would support the start-up procedure SPSIPROC in SPS.SPSSAMP (see Figure 17 on page 48).

If it is desired to restrict SPS from updating the libraries due to programming error, SPS.SPS1*, SPS.SPS2* and SPS.DUMP* (if dump data sets are used) could be defined as subgenerics using the same technique as for the control data sets. The SPS start-up procedures could be given read access to the SPS generic and SPS control data set subgeneric, and update authority to the trace and dump subgenerics.

Note: When defining data sets with more than two qualifier levels with enhanced generic naming (EGN) active in the RACF system, the above generic definitions should be changed to terminate with two asterisks instead of one asterisk ('**' from '*').

3.8 Trace

SPS provides the capability of collecting extensive trace information on processing errors. Two trace data sets may be allocated for each printer for collecting this information. The allocation of these data sets for each printer in a start-up procedure, although optional, is highly recommended. The user trace facility provides a wrap around trace table on disk that does not lose trace records. The data may also be directed to tape. SPS defaults, as delivered, generate a comprehensive trace to disk.

The use of trace data collection to disk or tape after installation checkout of the SPS product is only required when a problem has been detected and a trace needs to be generated. This will generally be done at the request of a service representative. The installation should therefore specify the start-up parameter TRACEFILE(NO) and TRACELEV(0) in the setup member for the printer after SPS is running satisfactorily (please see *SPS/MVS-APA*, *SPS/MVS-LIP*, or *SPS/MVS-MOD2 Administrator's Guide* for trace parameter information).

3.9 Coding the Start-up Procedure

The following steps should be followed to define and install the start-up procedure(s):

1. Determine how many start-up procedures will be used by the installation.
2. Choose a member name and stepname for each procedure (see "Naming Considerations" on page 58).
3. Determine which data sets should be included in the procedure (see "SPS Execution Data sets" on page 59).
4. Name the data sets included in the procedure (see "Naming Considerations" on page 58).
5. Generate the procedures by modifying the model start-up procedure in member SPSIPROC of SPS.SPSSAMP.

If only one printer type (APA, MOD2, or LIP) is to be supported by the procedure, the marked sections in the procedure for other printer types should be deleted. This should include either member ENGLISH1 or ENGLISH2 in DD SPSMSGDD. ENGLISH1 contains the LINE message file and member ENGLISH2 contains the APA message file.

If a single APA printer is to be supported, the twin printer output statement and the external storage data set should be removed.

If a twin APA printer is to be supported, the twin printer output statement is unnecessary if the option TWINMSG(S(NPRO)) is coded in the SETUPxxx member.

6. Move the SPS start-up procedures to the installation proclib

Figure 17 on page 48 shows a start-up procedure for an FSS that drives one APA (single or twin), one LIP and one MOD2 printer with the recommended data sets. The suggested naming conventions have been used.

4 Maintenance

4.1 Temporary Fixes

Temporary fixes will be supplied by Océ, when necessary, in the form of module replacements packaged as PTF's on a standard label tape. The tape will consist of a single file containing 1 or more PTF's and associated control cards. All PTFs will be adequately documented in the comments and processable by SMPE. The standard IBM utility program SMPE should be used to install the correction(s). Figure 19, Figure 20, and Figure 21 are sample jobs to receive, apply and accept an SPS PTF tape. They are quite similar to members SPSISRE0, SPSISAP0 and SPSISAC0 in SPS.SPSSAMP which are used to install SPS.

The PTF processing jobs should be modified to suit installation requirements. The receive job requires the volume serial number of the PTF tape. If the SMPPTS is not dynamically allocated, this DD card must be activated and modified to show its name and location. The jobs also assume that all SPS data sets have been defined to SMPE for dynamic allocation as was suggested in the SPS installation procedures (see "Allocate the SPS/MVS Install Data Sets" on page 20). If this is not the case, DD cards for each data set required must be added to the model jobs.

```
//RECEIVE EXEC SMPPROC
//SMP.SMPPTFIN DD DSN=SMPMCS,DISP=(OLD,PASS),
//              VOL=SER=NNNNNN,LABEL=(1,SL),
//              UNIT=(TAPE,,DEFER)
//SMP.SYSIN DD * (SMPCNTL)
              SET BDY(GLOBAL) .
              RECEIVE SYSMODS .
/*
```

Figure 19: Sample SMP PTF Receive Job

An apply check job should be run before an actual apply is performed. In the event a PTF applies to the SPS startio or abnormal end appendage and svclib is not dynamically allocated by SMPE, this DD card must be activated and updated to reflect the location of svclib. If linklib is used, this DD card must also be activated and updated to reflect the library location.

```
//APPLY JOB 'ACCOUNT #', 'NAME', MSGLEVEL=(1,1)
//APPLY EXEC SMPPROC
//*SMP.SVCLIB DD DSN=SYS1.SVCLIB,UNIT=XXXX,DISP=SHR,
//* VOL=SER=NNNNNN
//*SMP.LINKLIB DD DSN=SYS1.LINKLIB,UNIT=XXXX,DISP=SHR,
//* VOL=SER=NNNNNN
//SMP.SYSIN DD * (SMPCNTL)
SET BDY(SPSvrmT) .
APPLY CHECK .
/*
```

Figure 20: Sample SMP PTF Apply Job

An accept should be performed only after SPS has been run with the new sysmods for a while without problems. A good approach is to accept old sysmods when new sysmods are to be applied.

```
//ACCEPT JOB 'ACCOUNT #', 'NAME', MSGLEVEL=(1,1)
//ACCEPT EXEC SMPPROC
//SMP.SYSIN DD * (SMPCNTL)
SET BDY(SPSvrmD) .
ACCEPT .
/*
```

Figure 21: Sample SMP PTF Accept Job

5 Performance Considerations

5.1 Memory

The memory requirements of an SPS procedure varies depending on the number of printers that are to be run under one procedure and the size and number of buffers allocated for each printer. Another consideration is whether SPS re-entrant parts are in lpalib, linklib or a steplib. Storage estimates are given below for LINE and APA printers. If substantially more and bigger buffers than the default values are allocated, the numbers provided may have to be increased.

Substantial real storage savings can be achieved when multiple printers are being driven, by SPS depending on how it is installed. The use of linklib or steplib will cause a copy of SPS to be loaded into each SPS address space. Each SPS address space will use a separate real storage copy of SPS. An installation that has the re-entrant portions of SPS in lpalib will only require one copy of SPS for the entire system regardless of the number of SPS procedures. Therefore, if a steplib or linklib approach has been used, it is better to have multiple printers driven by each SPS procedure. If an lpalib approach has been used, there is little advantage in having more than one printer per SPS procedure.

Most SPS code and dynamic areas are located above the line. Just some code and areas must remain below the line because of system restrictions and compatibility reasons. Data management buffers and control blocks (trace files, system resource libraries) are located below the line and may take quite a large amount of storage. Trace files have 20 IO-buffers per default for APA-printers. The region estimation below is always given in the form xxx(yyy), where xxx are the requirements below the line and yyy are the requirements above the line.

5.1.1 SPS/MVS-LIP and -MOD2 Storage Estimates

When SPS LIP or MOD2 is located in a linklib or steplib and the default buffer allocations are used, an installation should allocate 200K(1.3M) of virtual storage for the first driver in a procedure and 200K(800K) for each additional driver to run under that procedure. Using these estimates an installation using steplib or linklib driving 2 printers with one procedure

Performance Considerations

and 1 printer with another procedure would require 400K(2.1M) in one procedure and 200K(1.3M) in the other.

When the re-entrant portions of SPS are located in lpalib and default buffer allocations are used, an installation should allocate 200K(800K) of virtual storage for each driver to be run under a procedure. Using these estimates an installation using lpalib driving 2 printers with one procedure and 1 printer with another procedure would require 400K(1.6M) in one procedure and 200K(800K) in the other.

5.1.2 SPS/MVS-APA Storage Estimates

When SPS is located in linklib or steplib and the default buffer allocations are used, an installation should allocate 50K(1.8M) of virtual storage for the fixed overhead of the base product and APA driver. To this should be added 550K(1.5M) for the dynamic requirement of each single printer driven, and 550K(2M) for the dynamic requirement of each twin printer driven. These requirements are considering 160K below the line for trace file buffers (20x4K buffers for each file) and 80K for resource file buffers (a pool of 10 buffers each with a maximum block size of 8K). If you are not using trace files or your resource libraries have a smaller block size, you should reduce the amount of storage correspondingly.

For twin printers the size of the resident buffer (NDFBUFL in SETUPxxx) must be added. This is an additional 0K(8M) for each twin printer being driven if the twin printer is to be driven using the default twin printer resident buffer size. This would be a total of 600K(3.3M) for the first APA single printer and 600K(11.8M) for the first twin printer (assuming the default buffer size of 0K(8M)). Additional single APA printers add 550K(1.5M) per printer, additional twin printers add 550K(10M) per printer (assuming default buffer size). Using these estimates an installation with a single procedure using steplib or linklib driving two single printers and one twin printer would require a region size of 1.7M(14.8M) virtual storage.

When SPS is located in lpalib, no virtual storage is required for the fixed overhead of the base product and APA driver. The dynamic requirement for single and twin printers and the buffer requirement for twin printers are the same as in the previous paragraph: 550K(1.5M), 550K(2M) and 0K(8M) respectively. This would be a total of 550K(1.5M) for the first APA single printer and 550K(10M) for the first twin printer. Additional single and twin APA printers add the same amount for each printer type as the first printer of that type. Using these estimates an installation with a single procedure using lpalib driving two single printers and one twin printer would require a region size of 1.65M(13M) virtual storage.

5.2 Libraries

SPS can be installed by using a steplib, linklib or lpalib. The simplest approach is to use a steplib. When an installation has only one SPS printer, this method will have little performance impact on the system. The use of linklib instead of a steplib will reduce search time and possibly load time.

If an installation requires more than one start-up procedure, it is desirable to place SPS in lpalib to avoid multiple copies of SPS in the system (see "Memory" on page 71). This approach also keeps search and load time to a minimum. When all the SPS printers in the system can be driven by one procedure, little advantage will be gained through the use of lpalib. Only search and load time will be reduced, real memory requirements will remain the same.

5.3 Trace Files

If you need to run SPS collecting trace data to the trace files and you are having start-stops in your printer, you may try to increase the number of buffers used by the access method to write to the trace files. You may do that via the BUFNO subparameter from the DCB parameter specified in both DD statements from the trace files.

5.4 Start-Stop Problems

When you experience start-stop problems, the first issue is normally to determine if the problem is located on the printer driver - SPS - or the printer. The SPS STAQ command displays the i/o queues from SPS with information about the active and posted queues and the received and committed page counters from the printer(s). This command, when given automatically by SPS via the parameter STAQINT from SETUPxxx (or QINT command), may show the trend of the queues and counters during printer activity and give an indication of the reason for the start-stop problem.

6 Diagnosis

6.1 Error Reporting

All SPS message and abend code descriptions include instructions concerning what should be done about the problem. When suggested system programmer actions do not resolve a problem, it should be submitted to the Océ service representative with the appropriate documentation as described in this chapter.

Printer hardware errors are recorded in SYS1.LOGREC and can be reviewed with EREP.

6.2 Associated Documentation

All problems reported to Océ should be accompanied by the following documentation, if possible:

- The JCL and output listings of the job that encountered the error,
- A listing of the user control file member pointed to by the JCL.
- A listing or copy of the SPS.SPSPARM data set. If more convenient, a listing of all members used in the initialization of the printer and execution of the job. This should include the following members for printer *nnn* and form *aaaa*⁵ if they are used:

Member	Contents
SPSPRINT	Printer table
SETUPnnn	SPS initialization parameters

⁵ Where *nnn* is either an APA or LINE printer device number and *aaaa* is either an APA or LINE printer form name.

FORMnnn	Form table
MSGSunnn	Message table
KEYnnn	Control key data set list
HSMTaaaa	Special header, separator, message, and trailer pages for the form requested in the JCL
DFLTaaaa	Form control file for the form requested in the JCL

- A SYSLOG listing.
- Tape copy of the SPS trace data set(s) covering the time when the problem occurred. The trace data set should be generated by the FPTRACE job in ITF⁶ format (see "ITF Trace Tape Generation" on page 78).
- If an ABEND has resulted in a dump, the dump should be sent on tape.

Very useful for problem determination are the options PRINTOPT(YES) and PRINTSET(YES) from SETUPxxx and control file. With these options active, SPS lists all SETUPxxx and file options, with its respective sources in the message page or syslog. This may help to identify wrong parameters used. The SPS commands PTFI and PRTI are very useful for problem determination, because they show the PTF level of all SPS modules and the printer characteristics and features. The syslog output of these 2 commands should be also sent to Océ as diagnostic data (see the *SPS Administrator's Guide* for further details about these commands). If you have a problem related to APA resources usage (correct font being used, for example), look also at the RESLIST parameter from SETUPxxx. With this option you obtain a list of all used external APA resources and the respective libraries from where they were loaded.

6.3 When to Dump

SPS will always take a diagnostic dump for any conditions in which it would be useful. ***Even when SPS is cancelled by the operator due to a wait or loop condition, no dump should be requested.*** The SPS ESTAE routine will receive control from the cancel command and take a user 222 dump. If a dump is requested by the operator, a second dump will be taken by the operating system.

⁶ SPS ITF (Internal Trace Format) tapes have no relationship to the ITF (Internal Trace Facility) delivered with Océ printers for hardware diagnostics from a PC.

In all situations where SPS is capable of recovering from an error and a dump would be useful for diagnostic purposes, SPS takes a dump unless the DUMP(NO) option in the SETUPnnn member for the printer has been selected. This option is generally not recommended. In the event of an error while running with the DUMP(NO) option, the option should be changed to YES and SPS reinitialized. Then the problem should be recreated, so a dump is available to the Océ service representative.

If one SPS printer is hanging and you have other printers running under the same procedure, you should cancel the hanging printer via the F SPSx,PRTx,CANCEL command. See the *SPS Administrator's Guide* for more information.

6.4 When to Trace

The SPS internal trace facility is one of the most useful tools for diagnosing system or SPS internal problems. The product should always be run with trace level 3 for testing, maintenance, installation, and trace level 0 for normal production. For all reproducible problems, trace data should be collected in the trace data sets at trace level 4. The trace specification may be dynamically changed via SPS commands (close and open the trace files, change the trace level and set). See the *SPS Administrator's Guide* for more information.

6.5 Trace Generation

The suggested normal running mode for SPS is trace level 0 and no trace data sets (TRACEFILE(NO) in SETUPnnn). This will produce a flow trace of reasonable size in an abend dump with very little system overhead and no impact on print time. However, if an installation is experiencing problems, SPS should be run with large user trace data sets at trace level 4. This trace level will impact the printer performance and place an I/O overhead on the system.

The use of the TRACETYPE and TRACESET options requires a knowledge of the internals of SPS. These options are mainly to be used as requested by an Océ service representative when special diagnostic traces are needed. Using the defaults for these options will produce all information possible. This is the suggested mode when no special request has been made by an Océ service representative.

The trace generation related parameters are TRACEFILE, TRACELEV, TRACESET and TRACETYPE. For coding information please see the respective parameters under "Printer

Execution Parameters" in the *SPS/MVS-APA*, *SPS/MVS-LIP*, or *SPS/MVS-MOD2 Administrator's Guide*.

For all reproducible problems, in the absence of any special instructions from an Océ service representative, the trace information should be:

- At trace level 4
- Directed to large user trace data sets or to tape (TRACEFILE(USER))
- Run with options TRACETYPE(ALL) and TRACESET(FFFFFFFFFFFFFFFF) for these parameters in the SETUPnnn member for the printer. These are the defaults when TRACETYPE and TRACESET are not specified.

6.6 ITF Trace Tape Generation

Trace data generated to the SPS trace data sets must be formatted into an ITF⁷ trace tape for submission to Océ. This is accomplished by running the trace formatting job FPTRACE supplied in SPS.SPSSAMP. The job can also be used to generate trace reports on site by Océ service representatives.

A sample job with the correct control cards for generating an ITF trace tape can be found in Figure 23. The TROUT dd card should be adjusted to installation requirements and the input trace data sets must be set to their correct names before running.

⁷ SPS ITF (Internal Trace Format) tapes have no relationship to the ITF (Internal Trace Facility) delivered with Océ printers for hardware diagnostics from a PC.

```
//SUSER JOB 'ACCOUNT #', 'NAME', MSGLEVEL=(1,1)
//*
//* FPTRACE - UNLOAD SPS TRACE RECORDS
//*
//*****
//* SAMPLE JOB TO GENERATE ITF TAPE
//*****
//*
//S1 EXEC PGM=SPSMPTRC
//STEPLIB DD DSN=SPS.SPSLINK, DISP=SHR
//TRMSG DD SYSOUT=*
//TROUT DD DSN=ITF.desc.data, VOL=SER=volser, UNIT=TAPE,
// DISP=(NEW,KEEP)
//TRIN1 DD DSN=SPS.TRA1nnnn, DISP=SHR
//TRIN2 DD DSN=SPS.TRA2nnnn, DISP=SHR
//SYSIN DD *
// OUTPUT(ITF)
/*
```

Figure 23: Sample Trace Generation Job

6.7 EREP

If a printer hardware error occurs (APA printer - sense byte action codes 16 or 17; LINE printer - equipment check with sense byte 1 having X'80' and X'40' set), SPS will write an outboard record to SYS1.LOGREC. This record can be retrieved and reviewed through use of EREP options CUA=(xxxx), TYPE=O.

7 Messages and Codes

7.1 Conventions

All messages issued by SPS are in the following format:

SPxnnnt PRTn: TEXT

where:

- SP** Prefix identifier of all SPS messages.
- x** The component identifier of the message.
 - I** APA feature fmid of SPS (single and twin)
 - S** Base fmid of SPS
 - 1** LINE feature fmid of SPS (LIP and MOD2)
 - R** SPS PAGE Sort
- nnnn** Serial number of the message.
- t** Type of message:
 - A** Action message. This message needs an operator action.
 - E** Error message. This message occurred because of a severe error.
 - I** Informational message.
 - W** Warning message. Some unusual situation occurred.
- PRTn** JES printer name for the printer to which the message refers. The printer name is not repeated in each of the message descriptions in the manual, but will be present in all messages that are associated with a particular printer.

All SPS messages are issued with routing code 7 and no descriptor code.

7.2 SPS Messages

Explanations of all SPS messages and resultant system actions, along with suggested user, operator and systems programmer responses may be found in the *SPS/MVS-APA Messages Guide* or *SPS/MVS-LIP and SPS/MVS-MOD2 Messages Guide*.

7.3 SPS Abend Codes

Various abend codes can be issued by SPS to indicate error conditions. These codes appear in the text of the messages SPS0920E and SPS0513E. Most of these codes are only meaningful to the SPS systems support staff, and should be reported to your Océ service representative. Some codes can indicate a condition for which an installation can take corrective action. The abend codes that can be meaningful to an installation are listed in the *SPS/MVS-APA Messages Guide* or *SPS/MVS-LIP and SPS/MVS-MOD2 Messages Guide* together with an explanation and suggested action. When an installation cannot successfully resolve the problem by the action indicated, please report the problem and abend termination code information to your Océ support representative.

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