

FUJITSU Software

BS2000 OSD/BC V10.0

Commands

Volume 1: General Part

Valid for

SDF V4.7D

SDF-P-BASYS V2.5E

ASE V1.0B

BLSSERV V2.8A

CONV2PDF V1.0B

DSSM V4.3B

IMON-GPN V3.3A

JV V15.1A

POSIX-BC V10.0A

RFA V19.0A

RSO V3.6A

SECOS V5.4A

SPACEPRO V1.0A

SPOOL V4.9A

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Certified documentation according to DIN EN ISO 9001:2008

To ensure a consistently high quality standard and user-friendliness, this documentation was created to meet the regulations of a quality management system which complies with the requirements of the standard DIN EN ISO 9001:2008.

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1 Preface

The SDF command language (System Dialog Facility) supports entries in interactive mode, during the execution of procedures and in batch operation. SDF offers entry via an interactive menu interface (three levels), syntax check with subsequent correction dialog and the use of user-specific commands. SDF performance features are also available when entering program statements, provided the program utilizes the SDF interface.

The performance features of the SDF interface are explained in detail in the "SDF Dialog Interface" manual [15]. A brief description can be displayed using the HELP-SDF command. Further information concerning job-specific control options of the SDF interface is provided in the descriptions of the MODIFY-SDF-OPTIONS and SHOW-SDF-OPTIONS commands.

In BS2000 OSD/BC V1.0 and higher the SDF command language has replaced the ISP command language. Commands from the old command language ISP continue to be supported for the sake of compatibility,. The full functionality of SDF can be exploited only with commands and statements employing the SDF syntax (ISP commands are checked only with regard to their names).

Volume 1 of the "Commands" manual contains the various command overviews, general parts and a complete index for all volumes.

Volumes 2 - 7 of the "Commands" manual contain all the commands of the SDF command language for the operating system BS2000 OSD/BC (basic configuration).

In addition, they contain commands which can only be used in conjunction with a specific software product. In such cases, the command description includes a note to this effect. These commands are also described in the relevant product manuals.

Software configuration described

This description is valid for BS2000 OSD/BC V10.0. Where functions or commands are described which are only available when supplementary software products or components are used, a note to this effect is provided. The associated component plus the version currently described is specified for each command in the "Description status". A list of the description statuses is contained in the [section "Overview of the versions" on page 1-158](#).

1.1 Objectives and target groups of this manual

Volumes 1 to 7 of the “Commands” manual are designed for both privileged and nonprivileged users of the BS2000 command interface.

Users of nonprivileged commands need to be familiar with:

- the basics of the SDF dialog interface, as presented in the “ISDF Dialog Interface” manual [15].
- the basics of the Data Management System (DMS), as presented in the “Introductory Guide to DMS” [13].

Users of privileged commands need to be familiar with systems support duties. These duties are presented in the “Introduction to System Administration” [14].

The additional commands and functions included here are described in detail in the manuals for the individual software products.

1.2 Summary of contents

The "Commands" manual is split into Volumes 1 through 7:

1. Volume 1: General Part
2. Volume 2: ACTIVATE-SNAPSHOT – DECRYPT-FILE
3. Volume 3: DELETE-ALTERNATE-INDEX – LOGOFF
4. Volume 4: MAIL-FILE – MOVE-TASK-TO-CATEGORY
5. Volume 5: OPEN-VARIABLE-CONTAINER – SHOW-DSSM-INFORMATION
6. Volume 6: SHOW-FILE – SHOW-PUBSET-SPACEPRO-OPTIONS
7. Volume 7: SHOW-RESOURCE-ALLOCATION – WRITE-TEXT

Components of a command description

A command description consists of the following components:

- Command name plus brief description
- Description status
Name of the component to which the command belongs, and the version (shows the current description status).
- Functional area
Name of the functional group to which the command is assigned (see the [section “Overview of main functions of the BS2000 commands” on page 1-176](#))
- Domain
Name of one or more SDF domains (application areas) to which the command is allocated. In guided dialog the command is offered on the selection menu for these domains.
- Privileges
To execute the command the user needs one of the privileges listed here. Nonprivileged BS2000 users have the STD-PROCESSING privilege. This means that they can run any command allocated the STD-PROCESSING privilege.

Systems support duties are associated with various different privileges. These privileges and their default associations with system IDs are described in the “Introduction to System Administration” [14].

Note the following with regard to “security manager” and “audit file management” duties:
The SECURITY-ADMINISTRATION, SAT-FILE-MANAGEMENT and SAT-FILE-EVALUATION privileges which are associated with these duties restrict the use of certain commands to procedure mode. This is a feature of the security concept intended among other things to prevent the security officer directly calling procedures and programs unrestrictedly.
- Routing code (where appropriate)
Privileged users (system operators) can enter the command only at consoles to which this routing code is allocated.

- **Function**
A general description of the command's functionality. If the command is available to both privileged and nonprivileged users, functions which are available only to privileged users are described in a separate section. Numbers down the left-hand side of the "Overview of functions" (if present) refer you to the appropriate page of the operand descriptions.

Use of some operating commands is restricted to specific operating workstations. Such restrictions are indicated in the relevant command descriptions.
Detailed information on operating is contained in the "Introduction to System Administration" [14].
- **Format (syntax diagram)**
The syntax diagram describes the format in which to enter the command (see also [section "Conventions for input" on page 1-34](#)).
- **Operands (describes the operands if the command has any)**
- **Return codes**
- **Output format (optional in the case of SHOW commands)**
- **Output in S variable (optional in the case of SHOW commands)**
- **Notes (optional)**
- **Examples (optional)**

Related publications

Literature references are given in the text in abbreviated form. The full titles of all publications referred to can be found under "Related publications".

Readme file

The functional changes to the current product version and revisions to this manual are described in the product-specific Readme file.

Readme files are available to you online in addition to the product manuals under the various products at <http://manuals.ts.fujitsu.com>. You will also find the Readme files on the Softbook DVD.

Information under BS2000

When a Readme file exists for a product version, you will find the following file on the BS2000 system:

```
SYSRME.<product>.<version>.<lang>
```

This file contains brief information on the Readme file in English or German (<lang>=E/D). You can view this information on screen using the `SHOW-FILE` command or an editor. The `/SHOW-INSTALLATION-PATH INSTALLATION-UNIT=<product>` command shows the user ID under which the product's files are stored.

Additional product information

Current information, version and hardware dependencies, and instructions for installing and using a product version are contained in the associated Release Notice. These Release Notices are available online at <http://manuals.ts.fujitsu.com>.

1.3 Changes since the last edition of the manual

The following new commands are provided with BS2000 OSD/BC V10.0:

Command	Function
EXPORT-NODE-FILE	Delete catalog entry of node files (export node files)
IMPORT-NODE-FILE	Create catalog entry for node files (import)
LIST-NET-DIRECTORIES	Display directories released for Net-Storage
LIST-NODE-FILES	List node files on Net-Storage volume
MODIFY-LIVE-MIGRATION-DEFAULTS	Modify task-specific default behavior of commands and macros
SET-NET-CLIENT-ALTERNATE	Assign net clients for high availability
SHOW-ADDRESS-SPACE-STATUS	Show information on system and user address space
SHOW-LIVE-MIGRATION-DEFAULTS	Show task-specific and system-wide default behavior of commands and macros
SHOW-LIVE-MIGRATION-HISTORY	Show information on past live migrations
SHOW-NET-CLIENT-ALTERNATE	Show net clients for high availability

Table 1: New commands

The table below contains the most important changes to the existing commands.

Command	Change / Operand	Operand value	Function / Comment
ASSIGN-SYSDTA	DATA-ESCAPE-CHAR=		New operand: Defines variables replacement
COPY-FILE	CHANGE-DATE=		New operand: Specifies whether the change date of the source file is taken over
	PROTECT=	*SAME-AND-CHANGE-DATE	Operand value only supported for compatibility reasons; take over the change date of the source file with CHANGE-DATE= *SAME
CREATE-FILE	FILE-TYPE=		New operand: File type Net-Storage file: BS2000 file or node file
DELETE-FILE	FILE-TYPE=		New operand: Selects Net-Storage file: BS2000 file or node file

Table 2: Changes in the commands (Part 1 of 2)

Command	Change / Operand	Operand value	Function / Comment
EXPORT-FILE	FILE-TYPE=		New operand: Selects Net-Storage file: BS2000 file or node file
MODIFY-FILE-ATTRIBUTES	FILE-TYPE=		New operand: File type Net-Storage file: BS2000 file or node file
MODIFY-MASTER-CATALOG-ENTRY	PUBRES-UNIT=		New operand: Modifies the MN of the PUBRES
SHOW-MASTER-CATALOG-ENTRY	Output information		Display extended by the MN of the PUBRES
SHOW-FILE-ATTRIBUTES	FILE-TYPE=		New operand: File type Net-Storage file: BS2000 file or node file
	Output information		Extended for Net-Storage files: FILE-TYPE Additional S variables
SHOW-NET-STORAGE	UPDATE-VOLUMES=		New operand: Optionally ascertains the Net-Storage directories again and updates the NDM tables
SHOW-SYSTEM-INFORMATION	Note		Display depends on live migration default or system parameters

Table 2: Changes in the commands (Part 2 of 2)

Changes when CCOPY V9.0B is used

CCOPY V9.0B also supports Snapsets on VMAX3 systems:

- The Snapset versions from which reconstruction of a pubset can take place depends on the disk storage system (see the RESTORE-PUBSET-FROM-SNAPSET command):
In the case of VMAX3 systems, reconstruction can take place from any Snapset, and the Snapset used remains available after reconstruction has taken place.
- In the case of VMAX3 systems, no save pool is supported (SAVE-POOL operand in the SET-SNAPSET-PARAMETER command not relevant).
For VMAX3 systems, the SHOW-SNAPSET-CONFIGURATION command always displays *DEFAULT-POOL.
- An RA group is also possible for VMAX3 systems (setting using the SET-SNAPSET-PARAMETER command and output information with SHOW-SNAPSET-CONFIGURATION).

Changes starting with correction package 1-2017

- The commands MODIFY-LIVE-MIGRATION-DEFAULTS and SHOW-LIVE-MIGRATION-DEFAULTS are no longer supported.
- The function “Creating a PDF file” is no longer part of the component SPOOLSYS but of the new component CONV2PDF. The name of the parameter file changes accordingly (see the CONVERT-FILE-TO-PDF command).

Notes on the SE server

The released versions of the BS2000 operating system supports the SE server's Server Units

Name of the Server Unit	Architecture	Periphery type
Server Unit /390 (SU /390)	/390 architecture	Channel peripherals
Server Unit x86 (SU x86)	x86-64 architecture	Bus peripherals

On the SE server the device peripherals are only supported via Fibre Channel. Type 2 and type S channels are no longer supported (exception: virtual console on SU /390).

SPD disks are not supported as only the connection via Fibre Channel is supported on the SE server, but SPD disks are only supported on the type S channel.

SE servers have no global storage.

The manuals "Introduction to System Administration " and "System Installation" for BS2000 OSD/BC V10.0 apply for the SE server. The manuals for the current BS2000 version continue to apply for S and SQ servers, supplemented by a Readme file for BS2000 OSD/BC V10.0.

General information

The name BS2000/OSD-BC for the BS2000 basic configuration has changed and from Version V10.0 becomes: BS2000 OSD/BC.

Previous versions will be referred to by the previous name BS2000/OSD-BC.

The device type table for BS2000 OSD/BC is also contained in the "System Installation" manual [46]. The devices currently supported are specified in the BS2000 OSD/BC Release Notice.

1.4 Notational conventions

The following notational conventions are used:



Draws your attention to important information relating to the preceding passage.

Note

The word "Note" ahead of an indented paragraph shows that the following paragraph contains important information.

"Cross-reference"

Cross-references to chapters, sections or other publications are placed within double quotes. Cross-references to pages begin with the page number.

[1]

Numbers in square brackets refer to the corresponding item in the section "[Related publications](#)" on page 1-241.

Boldface

In explanations of syntax diagrams, the lines currently being explained are printed in boldface. Similarly, in examples input characters which appear on the screen are shown in boldface. Note the significance of boldface in the "[SDF syntax representation](#)" on page 1-37.

SYNTAX/Example

Syntax diagrams and examples of input and output are shown in a different font for emphasis. Syntax diagrams are also surrounded by a frame.

[]

Square brackets in syntax or format diagrams: the characters within the brackets are optional. Note the significance of square brackets in the "[SDF syntax representation](#)" on page 1-37.

{ }

Braces in syntax and format diagrams: one of the parameters within the braces is required.

Inner running header

Within lengthy operand description sections, the inner running header refers to the first-level operand currently being described.

2 General Part

The General Part contains the following sections:

- [Format of the SDF command language](#)
- [Conventions for input](#)
- [SDF syntax representation](#)
- [Input compression](#)
- [Replacing expressions in the input](#)
- [Language for SDF output](#)
- [Return codes](#)
- [Conditional expressions \(job variables\)](#)
- [System files](#)
- [Working with S variables](#)
- [Job switches](#)
- [Device type table](#)
- [Assignment of volume type code to volume type](#)
- [Information services of device management: Meanings of the output values of SHOW commands](#)
- [Time limits in BS2000](#)
- [Overview of test privileges](#)
- [SDF-P-BASYS](#)

2.1 Format of the SDF command language

The syntax description of SDF commands and statements is contained in the syntax files (see “SDF syntax files” in the “SDF Dialog Interface” [15]):

- Commands begin with a slash which in dialog mode is set by the system. SDF expects command input from the logical system file SYSCMD.
- SDF statements, i.e. statements intended for programs with SDF interface, begin with two slashes which in dialog mode are set by the system. SDF expects statement input from the logical system file SYSSTMT, which has the same assignment as system file SYSDTA.

Input data, i.e. data, parameters and statements read in by programs without SDF interface, are not analyzed by SDF. Such programs expect input data from the logical system file SYSDTA.

Commands/statements consist of the following elements:

- command/statement name
- operand names
- possible operand values (keywords and variable values)
- additional help texts explaining the command/statement and its operands.

Command/statement names, operand names and keyword values are contained as keywords in the syntax description. Keywords are specified as such (see [section “Input compression” on page 1-54ff](#)). Variable operand values are described by means of data types (see [table 4 on page 1-41ff](#)). The data type defines the character set and the rules used to form an operand value. SDF checks whether the specification for a variable operand value lies within the range of permissible values as defined by the data type. A variable value may also be defined as a dedicated (constant) value of a data type. Then instead of the data type the syntax description gives the appropriate constants (such as the names of the S variable streams in the ASSIGN-STREAM command: STREAM-NAME = SYSVAR / SYSMSG / SYSINF).

Keywords usually consist of several portions (or subnames) connected by hyphens. As a rule, the respective names are taken from the ordinary English-language environment. They are chosen in such a way that analogous facts are described by means of identical keywords throughout the command set. Commands always start with a verb. They are followed by the associated object to which the activity is to be applied, e.g. MODIFY-FILE-ATTRIBUTES causes the attributes of a file to be modified.

There are also pairs of opposite activities; for example:

CREATE-XY and DELETE-XY for the creation/deletion of an object XY.

Commands are assigned to different domains (application areas), depending on their respective uses. A command may occur in more than one domain.

Every operand has a name and at least one possible value. Operands may be hierarchically subordinate to an operand value. In this case this operand value initiates a structure which contains all the lower-ranking operands. The operands of a structure are enclosed in parentheses. Further structures may be initiated within a structure, this phenomenon is referred to as structure nesting.

Example of a structure

Format (excerpt from SHOW-FILE-ATTRIBUTES): Input:

```
,SELECT = *ALL / [*BY-ATTRIBUTES](...)  
  [*BY-ATTRIBUTES](...  
  | ,FILE-STRUCTURE = *ANY / list-poss(5): *PAM / *SAM / *ISAM / *BTAM / *NONE  
  
/show-file-attributes select=*by-attributes(file-structure=( *sam,*isam))
```

The FILE-STRUCTURE operand defines a specific file attribute and is subordinate to the operand value (the structure) *BY-ATTRIBUTES.

Concurrent specification of several operand values (in the form of a list) may be permissible. Operand values permitted as list elements are enumerated following “list-poss(n):” (see [table “Metasyntax” on page 1-39](#)), where n indicates the maximum number of list elements allowed.

Example of a list

Format: Input:

```
FILE-STRUCTURE = *ANY / list-poss(5): *PAM / *SAM / *ISAM / *BTAM / *NONE  
  
/show-file-attributes select=*by-attributes(file-structure=( *sam,*isam))
```

The FILE-STRUCTURE operand defines the file attributes SAM and ISAM

Most operands are preset with a default value. This operand value is used if no explicit specification is made (see [“Default values” on page 1-56](#)).

2.2 Conventions for input

The following should be noted when entering commands and statements:

- SDF interprets inputs in accordance with the standard code table **EBCDIC.DF.03** (e.g. uppercase/lowercase conversion). XHCS¹, if available, permits the use of extended character sets (CCS²). The coding of dollar sign (\$), number sign (#), commercial at (@), exclamation mark (!), circumflex (^), parentheses and brackets, the greater than and smaller than signs, asterisk (*), slash (/), colon, comma, semicolon, apostrophe and quotation mark (") in an extended character set must comply with the coding in the standard code table. SDF interprets additional characters of an extended character set only within the data types <c-string> and <text>, i.e. uppercase/lowercase conversion makes use of an XHCS-supplied code table for that extended character set. SDF rejects all additional characters used within any of the other data types and reports a syntax error.

The following distinctions are made when using an extended character set:

- Input at the data display terminal: The CCS from the user entry is used for command input, provided 8-bit mode has been activated with the command MODIFY-TERMINAL-OPTIONS. For statement input, the CCS specified in the relevant macro call (CMDRST or RDSTMT, CMDTST or TRSTMT, or CMDCST or CORSTMT) is used. If no CCS has been specified, the same applies as for command input.
- Input from a file or PLAM library member: For command input, the CCS of the input file is used, or the CCS of the PLAM library member, provided SYSDTA has been assigned with the ASSIGN-SYSDTA command. For statement input, the CCS specified in the relevant macro call must be identical with the CCS for SYSDTA inputs. The statement will be rejected if the two CCS are not identical. During a procedure interrupt, the CCS selected for input at the data display terminal is used.
- Input from an S variable: If SYSDTA is assigned to a compound S variable, the CCS selected for input at the data display terminal is used in dialog mode. The CCS **EDF03IRV** is used in batch mode.
- The macro calls CMD and TRCMD do **not** support extended character sets.
- The first character of a command input is the slash "/"; a statement is preceded by two slashes "//". In the event of input at the display terminal, the slash(es) appear(s) automatically as a system prompt. In the event of input from a procedure file, the slash(es) must be included in the input records.

¹ The XHCS (eXtended Host Code Support) subsystem supports 8-bit code processing.

² Coded Character Set

- A label may be placed between slash and command name. They identify the command line as a branch destination within procedures. At least one blank must separate the label from the command name. Labels have different formats for S and non-S procedures:
 - The S label consists of a name with up to 255 characters (corresponding to <structured-name 1..255>) which is followed by a colon. S labels do not belong to the command. They are evaluated by SDF-P only and can only be used in S procedures.
 - The non-S label consists of a leading period and a name with up to 8 characters (corresponding to <name 1..8>).
- The command/statement name must be separated from the ensuing operand(s) by at least one blank.
- Operands have to be separated from each other by a comma.
- Operand values within a list must be separated by a comma. If several list elements are specified, the enumeration must be enclosed in parentheses.
- Operands may be entered either as keyword operands or as positional operands. In keyword operands, an equals sign links operand name and operand value. In positional operands, only the operand value is specified. The assignment being determined via the relative position of the operand within the input stream (see [page 1-57](#)).
- Further blanks between keywords, variable operand values, commas and equals signs are possible for documentation purposes and are ignored.
- Strings enclosed in quotes are interpreted as comments and ignored. Comments can be used in the same way as further blanks, but they are not permitted in front of labels.
- End-of-line comments: In S procedures the character string &* introduces an end-of-line comment, i.e. all subsequent characters up to the end of the line are ignored. This means especially that continuation characters, semicolons and &-expressions lose their special meaning.
- Continuation lines: A hyphen as the last character of an input record (with any number of trailing blanks) is interpreted as a continuation character. The ensuing input line thus becomes the continuation line of the preceding command or statement. If input is from the display terminal, the system issues “/” or “//” as a prompt requesting continuation of input. If commands/statements are entered from procedure/ENTER files, the continuation line must start with “/” or “//”. The continuation character must be written within the range of columns 2 to 72 if CONTINUATION=*NEW-MODE has been set (see SHOW-SDF-OPTIONS or MODIFY-SDF-OPTIONS). In the case of CONTINUATION=*OLD-MODE the continuation character can only be in column 72. Any characters following after column 72 are ignored. The maximum total length of a command (including any continuation lines) may be 16364 bytes including any blanks and comments. The total length of ISP commands (which are still supported) is 4096 bytes.

Input records for a statement may be longer than 72 characters and may have a continuation character in any column as of column 2. The maximum length of a statement is 16364 bytes.

In interactive mode (terminal input) the input record length and the position of any continuation character depends on the size of the input buffer of the display terminal, but may not exceed 16364 bytes.

In S procedures, the SET-PROCEDURE-OPTIONS INPUT-FORMAT=*FREE-RECORD-LENGTH can be used to freely define the length of command input records, as long as it does not exceed the maximum length of 16364 bytes. The continuation character may be entered in any column as of column 2.

- For input from non-S procedure files or ENTER files, keywords must be in uppercase format. The same is true of the values of procedure parameters, S variables and job variables if they are to replace part of the input.
- Using a semicolon between two commands permits the simultaneous input of a number of commands within one input record (with the possibility of continuation lines). This option exists in interactive mode and *S procedures* only.

2.3 SDF syntax representation

The following example shows the representation of the syntax of a command in a manual. The command format consists of a field with the command name. All operands with their legal values are then listed. Operand values which introduce structures and the operands dependent on these operands are listed separately.

HELP-SDF	Alias: HPSDF
<p> GUIDANCE-MODE = <u>*NO</u> / *YES ,SDF-COMMANDS = <u>*NO</u> / *YES ,ABBREVIATION-RULES = <u>*NO</u> / *YES ,GUIDED-DIALOG = <u>*YES</u> (...) <u>*YES</u>(...) SCREEN-STEPS = <u>*NO</u> / *YES ,SPECIAL-FUNCTIONS = <u>*NO</u> / *YES ,FUNCTION-KEYS = <u>*NO</u> / *YES ,NEXT-FIELD = <u>*NO</u> / *YES ,UNGUIDED-DIALOG = <u>*YES</u> (...) / *NO <u>*YES</u>(...) SPECIAL-FUNCTIONS = <u>*NO</u> / *YES ,FUNCTION-KEYS = <u>*NO</u> / *YES </p>	

This syntax description is valid for SDF V4.7. The syntax of the SDF command/statement language is explained in the following three tables.

Metasyntax

The meanings of the special characters and the notation used to describe command and statement formats are explained in [table 3](#).

Data types

Variable operand values are represented in SDF by data types. Each data type represents a specific set of values. The number of data types is limited to those described in [table 4](#).

The description of the data types is valid for the entire set of commands/statements. Therefore only deviations (if any) from the attributes described in [table 4](#) are explained in the relevant operand descriptions.

Suffixes for data types

Data type suffixes define additional rules for data type input. They contain a length or interval specification and can be used to limit the set of values (suffix begins with *without*), extend it (suffix begins with *with*), or declare a particular task mandatory (suffix begins with *mandatory*). The following short forms are used in this manual for data type suffixes:

case-sensitive	case-sens
cat-id	cat
completion	compl
correction-state	corr
digits	dig
generation	gen
lower-case	low
manual-release	man
odd-possible	odd
path-completion	path-compl
separators	sep
special-characters	spec
temporary-file	temp-file
underscore	under
user-id	user
version	vers
wildcard-constr	wild-constr
wildcards	wild

The description of the 'integer' data type in [table 5](#) contains a number of items in italics which are not part of the syntax. They are only used to make the table easier to read. For special data types that are checked by the implementation, [table 5](#) contains suffixes printed in italics (see the *special* suffix) which are not part of the syntax.

The description of the data type suffixes is valid for the entire set of commands/statements. Therefore only deviations (if any) from the attributes described here are explained in the relevant operand descriptions [table 5](#).

Metasyntax

Convention	Meaning	Examples
UPPERCASE	Uppercase letters denote keywords (command, statement or operand names, keyword values) and constant operand values. Keyword values begin with *.	HELP-SDF
UPPERCASE in boldface	Uppercase letters printed in boldface denote guaranteed or suggested abbreviations of keywords.	SCREEN-STEPS = *NO
=	The equals sign connects an operand name with the associated operand values.	GUIDANCE-MODE = *YES
< >	Angle brackets denote variables whose range of values is described by data types and suffixes (see 4 and 5).	GUIDANCE-MODE = *NO
<u>Underscoring</u>	Underscoring denotes the default value of an operand.	SYNTAX-FILE = <filename 1..54>
/	A slash serves to separate alternative operand values.	GUIDANCE-MODE = *NO
(...)	Parentheses denote operand values that initiate a structure.	NEXT-FIELD = *NO / *YES
[]	Square brackets denote operand values which introduce a structure and are optional. The subsequent structure can be specified without the initiating operand value.	,UNGUIDED-DIALOG = *YES (...) / *NO
Indentation	Indentation indicates that the operand is dependent on a higher-ranking operand.	SELECT = [*BY-ATTRIBUTES](...)
		GUIDED-DIALOG = *YES (...) *YES(...) SCREEN-STEPS = *NO / *YES

Table 3: Metasyntax (Part 1 of 2)

Convention	Meaning	Examples
<p> </p> <p>,</p> <p>list-poss(n):</p>	<p>A vertical bar identifies related operands within a structure. Its length marks the beginning and end of a structure. A structure may contain further structures. The number of vertical bars preceding an operand corresponds to the depth of the structure.</p> <p>A comma precedes further operands at the same structure level.</p> <p>The entry "list-poss" signifies that a list of operand values can be given at this point. If (n) is present, it means that the list must not have more than n elements. A list of more than one element must be enclosed in parentheses.</p>	<p>SUPPORT = *TAPE(...)</p> <pre> *TAPE(...) VOLUME = *<u>ANY</u>(...) *<u>ANY</u>(...) ... </pre> <p>GUIDANCE-MODE = *NO / *YES</p> <p>,SDF-COMMANDS = *NO / *YES</p> <p>list-poss: *SAM / *ISAM</p> <p>list-poss(40): <structured-name 1..30></p> <p>list-poss(256): *OMF / *SYSLST(...) / <filename 1..54></p>
Alias:	The name that follows represents a guaranteed alias (abbreviation) for the command or statement name.	HELP-SDF Alias: HPSDF

Table 3: Metasyntax (Part 2 of 2)

Data types

Data type	Character set	Special rules
alphanum-name	A...Z 0...9 \$, #, @	
cat-id	A...Z 0...9	Not more than 4 characters; must not begin with the string PUB
command-rest	freely selectable	
composed-name	A...Z 0...9 \$, #, @ \$, #, @ hyphen period	Alphanumeric string that can be split into multiple substrings by means of a period or hyphen. If a file name can also be specified, the string may begin with a catalog ID in the form :cat: (see data type filename).
c-string	EBCDIC character	Must be enclosed within single quotes; the letter C may be prefixed; any single quotes occurring within the string must be entered twice.
date	0...9 Structure identifier: hyphen	Input format: yyyy-mm-dd yyyy: year; optionally 2 or 4 digits mm: month dd: day
device	A...Z 0...9 hyphen	Character string, max. 8 characters in length, corresponding to a device available in the system. In guided dialog, SDF displays the valid operand values. For notes on possible devices, see the relevant operand description.
fixed	+, - 0...9 period	Input format: [sign][digits].[digits] [sign]: + or - [digits]: 0...9 must contain at least one digit, but may contain up to 10 characters (0...9, period) apart from the sign.

Table 4: Data types (Part 1 of 6)

Data type	Character set	Special rules
filename	A...Z 0...9 \$, #, @ hyphen period	<p>Input format:</p> $[:cat:][\$user.] \left\{ \begin{array}{l} \text{file} \\ \text{file(no)} \\ \text{group} \end{array} \right\}$ $\text{group} \left\{ \begin{array}{l} (*abs) \\ (+rel) \\ (-rel) \end{array} \right\}$ <p>:cat: optional entry of the catalog identifier; character set limited to A...Z and 0...9; maximum of 4 characters; must be enclosed in colons; default value is the catalog identifier assigned to the user ID, as specified in the user catalog.</p> <p>\$user. optional entry of the user ID; character set is A...Z, 0...9, \$, #, @; maximum of 8 characters; first character cannot be a digit; \$ and period are mandatory; default value is the user's own ID.</p> <p>\$. (special case) system default ID</p> <p>file file or job variable name; may be split into a number of partial names using a period as a delimiter: name₁[.name₂[...]] name_i does not contain a period and must not begin or end with a hyphen; file can have a maximum length of 41 characters; it must not begin with a \$ and must include at least one character from the range A...Z.</p>

Table 4: Data types (Part 2 of 6)

Data type	Character set	Special rules
filename (contd.)		<p>#file (special case) @file (special case) # or @ used as the first character indicates temporary files or job variables, depending on system parameter TEMPFILE.</p> <p>file(no) tape file name no: version number; character set is A...Z, 0...9, \$, #, @. Parentheses must be specified.</p> <p>group name of a file generation group (character set: as for "file")</p> <p>group { (*abs) (+rel) (-rel) }</p> <p>(*abs) absolute generation number (1-9999); * and parentheses must be specified.</p> <p>(+rel) (-rel) relative generation number (0-99); sign and parentheses must be specified.</p>
integer	0...9, +, -	+ or -, if specified, must be the first character.
name	A...Z 0...9 \$, #, @	Must not begin with 0...9.

Table 4: Data types (Part 3 of 6)

Data type	Character set	Special rules
partial-filename	A...Z 0...9 \$, #, @ \$, #, @ hyphen	<p>Input format: [:cat:][\$user.][partname.]</p> <p>:cat: see filename \$user. see filename</p> <p>partname optional entry of the initial part of a name common to a number of files or file generation groups in the form: name₁. [name₂. [...]] name_i (see filename). The final character of "partname" must be a period. At least one of the parts :cat:, \$user. or partname must be specified.</p>
posix-filename	A...Z 0...9 special characters	<p>String with a length of up to 255 characters; consists of either one or two periods or of alphanumeric characters and special characters. The special characters must be escaped with a preceding \ (backslash); the / is not allowed. Must be enclosed within single quotes if alternative data types are permitted, separators are used, or the first character is a ?, ! or ^. A distinction is made between uppercase and lowercase.</p>
posix-pathname	A...Z 0...9 special characters structure identifier: slash	<p>Input format: [/]part₁/.../part_n where part_i is a posix-filename; max. 1023 characters; max. 1023 characters; must be enclosed within single quotes if alternative data types are permitted, separators are used, or the first character is a ?, ! or ^.</p>

Table 4: Data types (Part 4 of 6)

Data type	Character set	Special rules
product-version	A...Z 0...9 period single quote	<p>Input format: <code>[[C]'] [V] [m] m.naso[']</code></p> <div style="text-align: right; margin-right: 20px;"> $\begin{array}{c} \\ \\ \text{correction status} \\ \text{release status} \end{array}$ </div> <p>where m, n, s and o are all digits and a is a letter. where m, n, s and o are all digits and a is a letter. Whether the release and/or correction status may/must be specified depends on the suffixes to the data type (see suffixes without-corr, without-man, mandatory-man and mandatory-corr in table 5).</p> <p>product-version may be enclosed within single quotes (possibly with a preceding C). The specification of the version may begin with the letter V.</p>
structured-name	A...Z 0...9 \$, #, @ \$, #, @	Alphanumeric string which may comprise a number of substrings separated by a hyphen. First character: A...Z or \$, #, @
text	freely selectable	For the input format, see the relevant operand descriptions.
time	0...9 structure identifier: colon	<p>Time-of-day entry:</p> <p>Input format: $\left. \begin{array}{l} \text{hh:mm:ss} \\ \text{hh:mm} \\ \text{hh} \end{array} \right\}$</p> <p>hh: hours mm: minutes ss: seconds $\left. \begin{array}{l} \text{Leading zeros may be} \\ \text{omitted} \end{array} \right\}$</p>
vsn	<p>a) A...Z 0...9</p> <p>b) A...Z 0...9 \$, #, @</p>	<p>a) Input format: pvsid.sequence-no max. 6 characters pvsid: 2-4 characters; PUB must not be entered sequence-no: 1-3 characters</p> <p>b) Max. 6 characters; PUB may be prefixed, but must not be followed by \$, #, @.</p>

Table 4: Data types (Part 5 of 6)

Data type	Character set	Special rules
x-string	Hexadecimal: 00...FF	Must be enclosed in single quotes; must be prefixed by the letter X. There may be an odd number of characters.
x-text	Hexadecimal: 00...FF	Must not be enclosed in single quotes; the letter X must not be prefixed. There may be an odd number of characters.

Table 4: Data types (Part 6 of 6)

Suffixes for data types

Suffix	Meaning												
<i>x.y unit</i>	<p>With data type “integer”: interval specification</p> <p><i>x</i> minimum value permitted for “integer”. <i>x</i> is an (optionally signed) integer.</p> <p><i>y</i> maximum value permitted for “integer”. <i>y</i> is an (optionally signed) integer.</p> <p><i>unit</i> with “integer” only: additional units. The following units may be specified:</p> <table style="margin-left: 40px;"> <tr> <td><i>days</i></td> <td><i>byte</i></td> </tr> <tr> <td><i>hours</i></td> <td><i>2Kbyte</i></td> </tr> <tr> <td><i>minutes</i></td> <td><i>4Kbyte</i></td> </tr> <tr> <td><i>seconds</i></td> <td><i>Mbyte</i></td> </tr> <tr> <td><i>milliseconds</i></td> <td></td> </tr> </table>	<i>days</i>	<i>byte</i>	<i>hours</i>	<i>2Kbyte</i>	<i>minutes</i>	<i>4Kbyte</i>	<i>seconds</i>	<i>Mbyte</i>	<i>milliseconds</i>			
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<i>seconds</i>	<i>Mbyte</i>												
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<i>x.y special</i>	<p>With the other data types: length specification</p> <p>For data types date, device, product-version and time the length specification is not displayed.</p> <p><i>x</i> minimum length for the operand value; <i>x</i> is an integer.</p> <p><i>y</i> maximum length for the operand value; <i>y</i> is an integer.</p> <p><i>x=y</i> the length of the operand value must be precisely <i>x</i>.</p> <p><i>special</i> Specification of a suffix for describing a special data type that is checked by the implementation. <i>special</i> can be preceded by other suffixes. The following units may be specified:</p> <table style="margin-left: 40px;"> <tr> <td><i>arithm-expr</i></td> <td>arithmetic expression (SDF-P)</td> </tr> <tr> <td><i>bool-expr</i></td> <td>logical expression (SDF-P)</td> </tr> <tr> <td><i>string-expr</i></td> <td>string expression (SDF-P)</td> </tr> <tr> <td><i>expr</i></td> <td>freely selectable expression (SDF-P)</td> </tr> <tr> <td><i>cond-expr</i></td> <td>conditional expression (JV)</td> </tr> <tr> <td><i>symbol</i></td> <td>CSECT or entry name (BLS)</td> </tr> </table>	<i>arithm-expr</i>	arithmetic expression (SDF-P)	<i>bool-expr</i>	logical expression (SDF-P)	<i>string-expr</i>	string expression (SDF-P)	<i>expr</i>	freely selectable expression (SDF-P)	<i>cond-expr</i>	conditional expression (JV)	<i>symbol</i>	CSECT or entry name (BLS)
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<i>cond-expr</i>	conditional expression (JV)												
<i>symbol</i>	CSECT or entry name (BLS)												
<i>with</i>	Extends the specification options for a data type.												
<i>-compl</i>	<p>When specifying the data type “date”, SDF expands two-digit year specifications in the form <i>yy-mm-dd</i> to:</p> <table style="margin-left: 40px;"> <tr> <td><i>20jj-mm-dd</i></td> <td>if <i>yy</i> < 60</td> </tr> <tr> <td><i>19jj-mm-dd</i></td> <td>if <i>yy</i> ≥ 60</td> </tr> </table>	<i>20jj-mm-dd</i>	if <i>yy</i> < 60	<i>19jj-mm-dd</i>	if <i>yy</i> ≥ 60								
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<i>19jj-mm-dd</i>	if <i>yy</i> ≥ 60												
<i>-low</i>	Uppercase and lowercase letters are differentiated.												
<i>-path-compl</i>	For specifications for the data type “filename”, SDF adds the catalog and/or user ID if these have not been specified.												

Table 5: Data type suffixes (Part 1 of 7)

Suffix	Meaning										
with (contd.)											
-under	Permits underscores (<code>_</code>) for the data type "name".										
-wild(n)	Parts of names may be replaced by the following wildcards. n denotes the maximum input length when using wildcards. Due to the introduction of the data types <code>posix-filename</code> and <code>posix-pathname</code> , SDF now accepts wildcards from the UNIX world (referred to below as POSIX wildcards) in addition to the usual BS2000 wildcards. However, as not all commands support POSIX wildcards, their use for data types other than <code>posix-filename</code> and <code>posix-pathname</code> can lead to semantic errors. Only POSIX wildcards or only BS2000 wildcards should be used within a search pattern. Only POSIX wildcards are allowed for the data types <code>posix-filename</code> and <code>posix-pathname</code> . If a pattern can be matched more than once in a string, the first match is used.										
	<table border="1"> <thead> <tr> <th>BS2000 wildcards</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>*</td> <td>Replaces an arbitrary (even empty) character string. An * appearing at the first position must be duplicated if it is followed by other characters and if the entered string does not include at least one further wildcard.</td> </tr> <tr> <td>Terminating period</td> <td>Partially-qualified entry of a name. Corresponds implicitly to the string <code>./*</code>, i.e. at least one other character follows the period.</td> </tr> <tr> <td>/</td> <td>Replaces any single character.</td> </tr> <tr> <td><s_x:s_y></td> <td>Replaces a string that meets the following conditions: a) If s_x is shorter than or exactly as long as s_y: <ul style="list-style-type: none"> - It is at least as long as s_x and no longer than s_y - In the alphabetic collating sequence it lies in the range from s_x to s_y - s_x may be empty (=1 character with the lowest coding) b) If s_x is longer than s_y: <ul style="list-style-type: none"> - It is at least as long as s_y and no longer than s_x - In the alphabetic collating sequence it lies in the range from s_x to a string which begins with s_y and is filled with characters of the highest possible coding to the length of s_x - s_y may be empty (=1 character with the highest coding) </td> </tr> </tbody> </table>	BS2000 wildcards	Meaning	*	Replaces an arbitrary (even empty) character string. An * appearing at the first position must be duplicated if it is followed by other characters and if the entered string does not include at least one further wildcard.	Terminating period	Partially-qualified entry of a name. Corresponds implicitly to the string <code>./*</code> , i.e. at least one other character follows the period.	/	Replaces any single character.	< s_x : s_y >	Replaces a string that meets the following conditions: a) If s_x is shorter than or exactly as long as s_y : <ul style="list-style-type: none"> - It is at least as long as s_x and no longer than s_y - In the alphabetic collating sequence it lies in the range from s_x to s_y - s_x may be empty (=1 character with the lowest coding) b) If s_x is longer than s_y : <ul style="list-style-type: none"> - It is at least as long as s_y and no longer than s_x - In the alphabetic collating sequence it lies in the range from s_x to a string which begins with s_y and is filled with characters of the highest possible coding to the length of s_x - s_y may be empty (=1 character with the highest coding)
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Table 5: Data type suffixes (Part 2 of 7)

Suffix	Meaning	
with-wild(n) (contd.)	<s ₁ ,...>	Replaces all strings that match any of the character combinations specified by s. s may also be an empty string. Any such string may also be a range specification “s _x :s _y ” (see page 1-48).
	-s	Replaces all strings that do not match the specified string s. The minus sign may only appear at the beginning of string s. Within the data types filename or partial-filename the negated string -s can be used exactly once, i.e. -s can replace one of the three name components: cat, user or file.
Wildcards are not permitted in generation and version specifications for file names. Only system administration may use wildcards in user IDs. Wildcards cannot be used to replace the delimiters in name components cat (colon) and user (\$ and period).		
POSIX wildcards		Meaning
*	Replaces an arbitrary (even empty) character string. An * appearing at the first position must be duplicated if it is followed by other characters and if the entered string does not include at least one further wildcard.	
?	Replaces any single character; not permitted as the first character outside single quotes.	
[c _x -c _y]	Replaces any single character from the range defined by c _x and c _y , including the limits of the range. c _x and c _y must be normal characters.	
[s]	Replaces exactly one character from string s. The expressions [c _x -c _y] and [s] can be combined into [s ₁ c _x -c _y s ₂]	
[!c _x -c _y]	Replaces exactly one character not in the range defined by c _x and c _y , including the limits of the range. c _x and c _y must be normal characters. The expressions [!c _x -c _y] and [s] can be combined into [!s ₁ c _x -c _y s ₂]	
[!s]	Replaces exactly one character not contained in string s. The expressions [!s] and [!c _x -c _y] can be combined into [!s ₁ c _x -c _y s ₂]	

Table 5: Data type suffixes (Part 3 of 7)

Suffix	Meaning										
-under											
-wild- constr(n)	<p>Specification of a constructor (string) that defines how new names are to be constructed from a previously specified selector (i.e. a selection string with wildcards). See also with-wild. n denotes the maximum input length when using wildcards.</p> <p>The constructor may consist of constant strings and patterns. A pattern (character) is replaced by the string that was selected by the corresponding pattern in the selector.</p> <p>The following wildcards may be used in constructors:</p> <table border="1"> <thead> <tr> <th>Wildcard</th> <th>Meaning</th> </tr> </thead> <tbody> <tr> <td>*</td> <td>Corresponds to the string selected by the wildcard * in the selector.</td> </tr> <tr> <td>Terminating period</td> <td>Corresponds to the partially-qualified specification of a name in the selector; corresponds to the string selected by the terminating period in the selector.</td> </tr> <tr> <td>/ or ?</td> <td>Corresponds to the character selected by the / or ? wildcard in the selector.</td> </tr> <tr> <td><n></td> <td>Corresponds to the string selected by the n-th wildcard in the selector, where n is an integer.</td> </tr> </tbody> </table>	Wildcard	Meaning	*	Corresponds to the string selected by the wildcard * in the selector.	Terminating period	Corresponds to the partially-qualified specification of a name in the selector; corresponds to the string selected by the terminating period in the selector.	/ or ?	Corresponds to the character selected by the / or ? wildcard in the selector.	<n>	Corresponds to the string selected by the n-th wildcard in the selector, where n is an integer.
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/ or ?	Corresponds to the character selected by the / or ? wildcard in the selector.										
<n>	Corresponds to the string selected by the n-th wildcard in the selector, where n is an integer.										
	<p>Allocation of wildcards to corresponding wildcards in the selector:</p> <p>All wildcards in the selector are numbered from left to right in ascending order (global index).</p> <p>Identical wildcards in the selector are additionally numbered from left to right in ascending order (wildcard-specific index).</p> <p>Wildcards can be specified in the constructor by one of two mutually exclusive methods:</p> <ol style="list-style-type: none"> 1. Wildcards can be specified via the global index: <n> 2. The same wildcard may be specified as in the selector; substitution occurs on the basis of the wildcard-specific index. For example:the second “/” corresponds to the string selected by the second “/” in the selector 										

Table 5: Data type suffixes (Part 4 of 7)

Suffix	Meaning
with-wild-constr(n) (contd.)	<p>The following rules must be observed when specifying a constructor:</p> <ul style="list-style-type: none"> – The constructor can only contain wildcards of the selector. – If the string selected by the wildcard <...> or [...] is to be used in the constructor, the index notation must be selected. – The index notation must be selected if the string identified by a wildcard in the selector is to be used more than once in the constructor. For example: if the selector “A/” is specified, the constructor “A<n><n>” must be specified instead of “A//”. – The wildcard * can also be an empty string. Note that if multiple asterisks appear in sequence (even with further wildcards), only the last asterisk can be a non-empty string, e.g. for “*****” or “*//*”. – Valid names must be produced by the constructor. This must be taken into account when specifying both the constructor and the selector. – Depending on the constructor, identical names may be constructed from different names selected by the selector. For example: “A/*” selects the names “A1” and “A2”; the constructor “B*” generates the same new name “B” in both cases. To prevent this from occurring, all wildcards of the selector should be used at least once in the constructor. – If the constructor ends with a period, the selector must also end with a period. The string selected by the period at the end of the selector cannot be specified by the global index in the constructor specification.

Table 5: Data type suffixes (Part 5 of 7)

Suffix	Meaning																				
with-wild-constr(n)	Examples:																				
	<table border="1"> <thead> <tr> <th>Selector</th> <th>Selection</th> <th>Constructor</th> <th>New name</th> </tr> </thead> <tbody> <tr> <td>A/*</td> <td>AB1 AB2 A.B.C</td> <td>D<3><2></td> <td>D1 D2 D.CB</td> </tr> <tr> <td>C.<A:C>/<D,F></td> <td>C.AAD C.ABD C.BAF C.BBF</td> <td>G.<1>.<3>.XY<2></td> <td>G.A.D.XYA G.A.D.XYB G.B.F.XYA G.B.F.XYB</td> </tr> <tr> <td>C.<A:C>/<D,F></td> <td>C.AAD C.ABD C.BAF C.BBF</td> <td>G.<1>.<2>.XY<2></td> <td>G.A.A.XYA G.A.B.XYB G.B.A.XYA G.B.B.XYB</td> </tr> <tr> <td>A/B</td> <td>ACDB ACEB AC.B A.CB</td> <td>G/XY/</td> <td>GCXYD GCXYE GCXY.¹ G.XYC</td> </tr> </tbody> </table>	Selector	Selection	Constructor	New name	A/*	AB1 AB2 A.B.C	D<3><2>	D1 D2 D.CB	C.<A:C>/<D,F>	C.AAD C.ABD C.BAF C.BBF	G.<1>.<3>.XY<2>	G.A.D.XYA G.A.D.XYB G.B.F.XYA G.B.F.XYB	C.<A:C>/<D,F>	C.AAD C.ABD C.BAF C.BBF	G.<1>.<2>.XY<2>	G.A.A.XYA G.A.B.XYB G.B.A.XYA G.B.B.XYB	A/B	ACDB ACEB AC.B A.CB	G/XY/	GCXYD GCXYE GCXY. ¹ G.XYC
	Selector	Selection	Constructor	New name																	
	A/*	AB1 AB2 A.B.C	D<3><2>	D1 D2 D.CB																	
	C.<A:C>/<D,F>	C.AAD C.ABD C.BAF C.BBF	G.<1>.<3>.XY<2>	G.A.D.XYA G.A.D.XYB G.B.F.XYA G.B.F.XYB																	
C.<A:C>/<D,F>	C.AAD C.ABD C.BAF C.BBF	G.<1>.<2>.XY<2>	G.A.A.XYA G.A.B.XYB G.B.A.XYA G.B.B.XYB																		
A/B	ACDB ACEB AC.B A.CB	G/XY/	GCXYD GCXYE GCXY. ¹ G.XYC																		
¹ The period at the end of the name may violate naming conventions (e.g. for fully-qualified file names).																					
without	Restricts the specification options for a data type.																				
-cat	Specification of a catalog ID is not permitted.																				
-corr	Input format: [[C]][V][m].na['] Specifications for the data type product-version must not include the correction status.																				
-dig	The file type name does not permit digits.																				
-gen	Specification of a file generation or file generation group is not permitted.																				
-man	Input format: [[C]][V][m].n['] Specifications for the data type product-version must not include either release or correction status.																				
-odd	The data type x-text permits only an even number of characters.																				
-sep	With the data type "text", specification of the following separators is not permitted: ; = () < > _ (i.e. semicolon, equals sign, left and right parentheses, greater than, less than, and blank).																				
-spec	The file type name does not permit any special characters.																				

Table 5: Data type suffixes (Part 6 of 7)

Suffix	Meaning
without (contd.)	
-temp-file	Specification of a temporary file is not permitted (see #file or @file under filename).
-user	Specification of a user ID is not permitted.
-vers	Specification of the version (see “file(no)”) is not permitted for tape files.
-wild	The file types posix-filename and posix-pathname must not contain a pattern (character).
mandatory	Certain specifications are necessary for a data type.
-corr	Input format: [[C]][V][m]m.naso[] Specifications for the data type product-version must include the correction status and therefore also the release status.
-man	Input format: [[C]][V][m]m.na[so][] Specifications for the data type product-version must include the release status. Specification of the correction status is optional if this is not prohibited by the use of the suffix without-corr.
-quotes	Specifications for the data types posix-filename and posix-pathname must be enclosed in single quotes.
case-sensitive	When specifications are made for the data types command-rest and text, a distinction is made between uppercase and lowercase. This also applies for specifications which are not enclosed in single quotes.

Table 5: Data type suffixes (Part 7 of 7)

2.4 Input compression

SDF offers the possibility of compressing the input of commands and statements in dialog or batch mode.

It should be noted, however, that an abbreviation which is unique today might be ambiguous in a functionally extended future BS2000 version. Users should therefore use abbreviations sparingly in automated command sequences.

2.4.1 Abbreviation of names

Basically, all names used (keywords) may be abbreviated:

- command/statement names
- operand names
- keyword values

Names can be abbreviated as follows:

- In compound names (name parts linked by a hyphen), portions can be omitted from right to left. The associated hyphen is omitted with a name part.
- Within a name portion or a simple name, characters can be omitted from right to left.
- A leading asterisk does not belong to the name it introduces. It is merely used to distinguish a keyword value from some other possible operand value whose range includes the string of the keyword value. The asterisk alone, even if it is unique, does not represent a valid abbreviation.
- Keyword values in guided dialog and in the syntax representation are always indicated by a leading asterisk. The leading asterisk of a keyword value can be omitted if no alternative variable operand value is possible whose value range contains the name of the keyword value. This abbreviation option can be restricted to allow for potential extensions in subsequent versions. For reasons of compatibility, operand values which were previously written without a leading asterisk are still accepted without the asterisk.
- The name or partial name of a keyword value can also contain a period (e.g. *V4.1 or *OSD-V2.0). The period is part of the (partial) name. If the name is abbreviated, the period must not be at the end of it.

For SDF to be able to interpret the abbreviated names correctly, the selected abbreviations must be unique in their immediate syntax environment. However, the syntax file may contain a minimum abbreviation for particular names. In this case, SDF will not accept any shorter input even if it would be unique.

Unique assignment is defined as follows:

- a command name is unique among all valid command names. If a partial name of a command is specified in full, this command is unique compared to a second command in which the specified partial name is an abbreviation of the same part of the name. With, for example, the commands START-C-COMPILER and START-COBOL-COMPILER, the input START-C-COMP can only refer to the command START-C-COMPILER.
- a statement name is unique among all valid statements of a loaded program
- an operand name is unique among all valid operands of the specified command or statement on the same structure level (for an operand name in a lower-ranking structure, only the valid operand names of this structure are considered)
- a keyword value is unique within the set of all possible values for the specified operand.

For example, the input MOD-SDF-OPT SYN-F=*NONE, GUI=*MIN is a possible abbreviation of MODIFY-SDF-OPTIONS SYNTAX-FILE=*NONE, GUIDANCE=*MINIMUM

The user manuals contain “guaranteed” abbreviations (emphasized by means of bold print in the text). These are not necessarily the shortest possible versions. However, they retain the basic meaning and will remain unique on a long-term basis. This cannot be ensured for any of the other abbreviations. Procedures should therefore contain only unabbreviated names, or guaranteed abbreviations, which also greatly enhances the clarity of the procedure.

In addition to the command or statement names, aliases may also be used in the manual. The defined command or statement alias is guaranteed in the long term. An alias comprises no more than 8 characters (A...Z), which are derived from the command or statement name. The alias cannot be further abbreviated. Example: MDSDFO instead of MODIFY-SDF-OPTIONS

The names listed in the manuals are also defined in the syntax files as standard names. These standard names will continue to be accepted even if the command names have been changed, albeit only in the unabbreviated form. For example, if the command name CREATE-FILE were changed to GENERATE-FILE, the entry CREATE-FILE would still be accepted, but CR-F would be rejected. For this reason, if procedures are to be completely immune against the renaming of commands, all names must be specified unabbreviated.

2.4.2 Default values

Specification of most operands is optional. Optional operands are preset with a default value. The default value is used for command/statement execution if no explicit specification is entered by the user. The operand values *UNCHANGED and *CURRENT stand for the existing setting, i.e. the present value is taken over.

Since only operand values that are not to have the default settings need to be specified explicitly, input can often be dramatically reduced.

If operands do not have default settings, or if they do not have the defaults that you require, you can define your own defaults for interactive input on a task-specific basis (for an example see the RESET-INPUT-DEFAULTS command; further details are given in the section headed “Task-specific default values” in the “SDF Dialog Interface” [15]).

For example, the entry MOD-SDF-OPT SYN=*N, GUID=*MIN is a possible abbreviation of:

```
MOD-SDF-OPT SYN=*NONE, GUID=*MIN, LOG=*UNCH, UT=*UNCH, PROC=*UNCH,  
CONT=*UNCH, MENU=*UNCH, MODE=*UNCH, DEFAULT-PROG=*UNCH, FUNCTION-KEYS=*UNCH,  
INPUT-HISTORY = *UNCH
```

Note

The default value of an operand should not be confused with the operand value *STD. The operand value *STD need not be the default value. The meaning of *STD is given individually in each operand description. *STD can be, for example, a value set at system installation (e.g. SPACE=*STD in the CREATE-FILE command) or a setting dependent upon the task mode (e.g. DIALOG-CONTROL=*STD in the DELETE-FILE command).

2.4.3 Positional operands

Any operand may be specified either as a keyword operand or as a positional operand. When keyword operands are entered, the operand name and the desired value are specified together in the format <operand-name>=<operand-value>. When positional operands are entered, only the operand value is specified; correct assignment is ensured via its position in the input stream as prescribed by the command/statement definition. Assignment takes place solely on the basis of the position in the input stream compared to the command/statement definitions. The following should be noted when entering positional operands:

- Whenever an operand preceding a positional operand is omitted, a comma must be entered instead.
- If an operand is entered as a keyword operand, no positional operands may be entered at the same structure level.

For example, the input `MOD-SDF-OPT *NONE , *MIN` is a possible abbreviation of `MOD-SDF-OPT SYN-F=*NONE , GUID=*MIN`.

It cannot be fully ruled out that an operand position will change in the event of a version change. For this reason, only keyword operands should be used in procedures.

2.4.4 Compressing structures

The specification of structures offers the following options for input compression:

STRUCTURE-IMPLICIT notation

Specification of the structure-initiating operand is omitted and the subordinate operand is entered outside the structure parentheses. The prerequisite for this is generally that the subordinate operand is unique with respect to the entire command/statement or to a higher-ranking structure. Operands for which the STRUCTURE-IMPLICIT notation is guaranteed in the long term are listed explicitly in the corresponding command or statement description.

Example

```
SHOW-FILE-ATTR ACCESS-METHOD=*ISAM
```

is the abbreviated notation for

```
SHOW-FILE-ATTR SEL=*BY-ATTR(ACCESS-METHOD=*ISAM)
```

Note

In many cases in which the STRUCTURE-IMPLICIT notation is not possible, “flat notation” as outlined below can be used.

Flat notation

The structure-initiating operand is specified. The subordinate operand, however, is entered outside the structure parentheses. The subordinate operand need not be unique with respect to the entire command/statement. It must not occur in more than one active structure. Note that a structure is activated not only explicitly but also implicitly via the default value, if an operand specification is omitted.

Flat notation is not guaranteed on a long-term basis.

Example

```
CRE-FILE FILE1,SUP=*PRIV-DISK,VOL=ABC123,DEV-TYPE=D3475
```

is the abbreviated notation for

```
CRE-FILE FILE1,SUP=*PRIV-DISK(VOL=ABC123,DEV-TYPE=D3475)
```

Notation if NULL-ABBREVIATION=YES

The subordinate operand is entered within the structure parentheses, but the structure-initiating operand value is reduced to a null string, i.e. omitted. The prerequisite for this is that the structure-initiating operand value has been defined with the attribute NULL-ABBREVIATION=YES in the syntax file. This attribute can be assigned only once within the set of possible operand values (if several structure-initiating operands are admitted; see the “SDF-A” manual [33]).

In the syntax representation, operand values for which the attribute NULL-ABBREVIATION is guaranteed on a long-term basis are enclosed in square brackets (see “SDF syntax representation” on page 1-37).

Example

```
MOD-FILE-ATTR FILE1,PROTECTION=(ACCESS=*READ)
```

is the abbreviated notation for

```
MOD-FILE-ATTR FILE1,PROTECTION=*PARAMETERS(ACCESS=*READ)
```

2.5 Replacing expressions in the input

The value of a procedure parameter, an S variable expression or a job variable can substitute a command/statement portion. The expression to be substituted is marked by a '&' character, followed immediately by the name of the procedure parameter or job variable or by an S variable expression enclosed in parentheses. SDF substitutes the actual value for the expression prior to execution of the command/statement. It performs a syntax check on the resulting input. This substitution of expressions is permissible in unguided dialog, in procedures and in batch mode. In (temporarily) guided dialog, it is restricted to the NEXT line and to input for operand values.

Substituting procedure parameters

In non-S procedures, expressions of the form '¶meter', when used in commands, are replaced by the value assigned to *parameter* in the command BEGIN-PROCEDURE or CALL-PROCEDURE or during prompting. Expressions are replaced in commands. When used in input data (read from SYSDTA), such expressions are replaced only if an escape character (#, @, & or *) has been defined in the ESCAPE-CHARACTER operand of the BEGIN-PROCEDURE command and the expression begins with this character. When used in statements (read from SYSSTMT), such expressions are currently replaced as in commands. It is, however, advisable to define ESCAPE-CHARACTER='&', because the handling of such expressions may be modified.

The following restrictions apply to substituting procedure parameters:

- No substitution is possible within CJC command sequences.
- In procedures or ENTER files, procedure parameters cannot replace the slash introducing commands or the two slashes introducing statements, the period introducing non-S labels, the semicolon separating commands or the continuation character.
- Expressions cannot be nested.
- A double “&” or escape character inhibits substitution, the second “&” or escape character is ignored.

Substituting job variables

This function requires the chargeable subsystem JV to be loaded.

Expressions to be replaced by job variables are specified as follows:

- directly via the job variable name in the form “&(jv-name)”
- indirectly via the job variable link name in the form “&>(*jv-link)”. The assignment of the link name to the job variable takes place prior by means of the command SET-JV-LINK LINK-NAME = jv-link, JV-NAME = jv-name.

Note

Before job variable replacement, ACS, if required, replaces the alias of a JV by its real path name (in accordance with the alias catalog entry).

The following restrictions apply to substituting job variables:

- An expression can be replaced only by a job variable in its full length.
- Read access must have been granted to the job variable value to be substituted for the expression, otherwise the input will be rejected as a syntax error.
- No substitution is possible within CJC command sequences.
- Job variables cannot be substituted for input data. SDF treats statements intended for programs with SDF interface like commands and not like input data.
- In procedures, job variables cannot replace the slash introducing commands or the two slashes introducing statements, the period introducing non-S labels, the semicolon separating commands or the continuation character.
- Job variables cannot be used as procedure parameters. This restriction can be circumvented, for instance, by using a link name (see example 3).
- Expressions cannot be nested.
- With interactive mode or S procedures, job variable substitution in the manner outlined above is effected only if no identical S variable or builtin function is known. This mechanism can be replaced, however, by the builtin function JV(). In this case the appropriate entry would take the form “&(JV(JV-NAME=<c-string 1..54>))”. (See builtin function JV() on [page 1-146](#). If the job variable name contains the catalog and/or user ID, only job variable substitution is possible.

Substituting S variable expressions

In dialog mode and in S procedures, expressions of the form “&(expression)”, when used in commands, are replaced by the value of *expression*, where *expression* may be the name of an S variable, a builtin function or a valid S variable expression. If the expression is to be substituted by an S variable whose name does not contain any period, it may also have the form “&s-variable”. Procedure parameters of an S procedure are S variables and are replaced in expressions also.

Expressions are replaced in commands. When used in input data (read from SYSDTA), such expressions are replaced only if an escape character (#, @, & or *) has been defined in the DATA-ESCAPE-CHARACTER operand of the SET-PROCEDURE-OPTIONS command and the expression begins with this character. When used in statements (read from SYSSTMT), such expressions are currently replaced as in commands.

Expressions may be nested.

The following restrictions apply to substituting S variable expressions:

- Control flow commands cannot be generated.
- The S variable expression to be replaced is converted to type STRING.
- S labels cannot be generated.
- No substitution is possible within CJC command sequences.
- In procedures or ENTER files, S variable expressions cannot replace the slash introducing commands or the two slashes introducing statements, the period introducing non-S labels, the semicolon separating commands or the continuation character.
- A double “&” or escape character inhibits substitution, the second “&” or escape character is ignored.

Examples

1. Substituting job variables in dialog mode

```

/cre-jv jv=cmd _____ (1)
/mod-jv jv=cmd,set-value='SHOW-FILE-ATTR' _____ (2)
/&(amp;cmd) _____ (3)
%      3 :20SG:$USER1.ALT.SYS.LOGON.USERPROC.X1
%     51 :20SG:$USER1.ALT.SYSSDF.USER.EXAMPLE.1
%     21 :20SG:$USER1.DATA.1
%     48 :20SG:$USER1.DATA.2
%     84 :20SG:$USER1.DATA.3
%     66 :20SG:$USER1.OUT.SORT1-2
%      3 :20SG:$USER1.PROC.JV
%:20SG: PUBLIC:      7 FILES RES=      276 FRE=      39 REL=      21 PAGES

/mod-jv jv==egon,set-value='-FILE-ATTR F-NAME=PROC.' _____ (4)
/set-jv-link link-name=walter,jv-name=egon _____ (5)

```

```

/sh&(*walter)
%          3 :2OSG:$USER1.PROC.JV ----- (6)
%:2OSG: PUBLIC:      1 FILE RES=          3 FRE=          2 REL=          0 PAGES

```

- (1) The job variable name 'CMD' is declared.
- (2) The job variable CMD is assigned the value 'SHOW-FILE-ATTR' (short for the name of the command SHOW-FILE-ATTRIBUTES).
- (3) After the command has been sent off, the variable string is replaced with the command defined in the job variable, and the command is executed.
- (4) The value of job variable EGON is changed. It now contains only part of the command name ('-FILE-ATTRIBUTES') and the partially qualified file name 'PROC.'
- (5) Job variable EGON is assigned the link name 'WALTER'.
- (6) After the command has been sent off, the variable string is replaced with the command portion assigned to the job variable, and the command is executed. The reference to the job variable is established via the link name.

2. Substituting job variables and S variables in dialog mode

```

/sh-jv cmd ----- (1)
%SHOW-FILE-ATTR
/&(amp) proc.jv ----- (2)
%          3 :2OSG:$USER1.PROC.JV
%:2OSG: PUBLIC:      1 FILE RES=          3 FRE=          2 REL=          0 PAGES
/cmd='PRINT-DOCUMENT' ----- (3)
/sh-var cmd
CMD = PRINT-DOCUMENT
/&(amp) proc.jv ----- (4)
% SCP0810 SPOOLOUT FOR FILE ':2OSG:$USER1.PROC.JV' ACCEPTED. TSN: '1FAL', SPOOL
OUT-NAME: 'SDFTEST', MONJV: '*NONE'
% SCP1025 PRINT JOB ACCEPTED BY SERVER 'GH5090Y0' WITH TSN '5BXC'
/&(amp;:2osg:cmd) proc.jv ----- (5)
%          3 :2OSG:$USER1.PROC.JV
%:2OSG: PUBLIC:      1 FILE RES=          3 FRE=          2 REL=          0 PAGES
/&(amp;jv(jv-name='CMD')) proc.jv ----- (6)
%          3 :2OSG:$USER1.PROC.JV
%:2OSG: PUBLIC:      1 FILE RES=          3 FRE=          2 REL=          0 PAGES
/

```

- (1) The job variable CMD has the value SHOW-FILE-ATTR.
- (2) The command name from the job variable CMD is substituted i.e. SHOW-FILE-ATTRIBUTES is executed for the file PROC.JV.
- (3) The S variable CMD is created implicitly by being assigned the value PRINT-DOCUMENT.

- (4) The expression `&(CMD)` in the input is now replaced by the contents of the S variable `CMD`, i.e. the command `PRINT-DOCUMENT` is executed for the file `PROC.JV`.
- (5) The name of the job variable `CMD` is prefixed by the catalog ID in order to retain its contents during substitution.
- (6) Job variable substitution can alternatively be achieved using the builtin function `JV()`.

3. Submitting the name of the job variable to be substituted as procedure parameter of a non-S procedure

```

/BEGIN-PROC PAR=*YES(PROC-PAR=&PARAM1) _____ (1)
.
.
.
/SET-JV-LINK LINK-NAME=PARAM1 ,JV-NAME=&PARAM1 _____ (2)
/(&(*PARAM1) FILE-NAME=LST.JOB _____ (3)
.
.
.
/END-PROC

```

- (1) The job variable to be specified via procedure parameter `PARAM1` is to contain the current command to be executed. As the entry “`&(&PARAM1)`” is illegal, a link name will have to be assigned. See Example 4 (4) for the optional use of a nested expression.
- (2) The current job variable name is inserted for procedure parameter `PARAM1` and assigned the link name `PARAM1`.
- (3) The contents of the declared job variable are substituted for the link name `PARAM1`. For instance, if the job variable value is `PRINT-DOCUMENT DOCUMENT-FORMAT=*TEXT(LINE-SPACING= *BY-EBCDIC-CONTROL), LAYOUT-CONTROL=*PAR(ROTATION=90, LEFT-MARGIN=10)` then the file `LST.JOB` is printed as specified. If the job variable value changes to `SHOW-FILE-ATTRIBUTES INFORMATION=*PAR(HISTORY=*YES, SECURITY=*YES)`, the requested file attributes of the file `LST.JOB` are displayed.

4. Substituting job variables and S variables in an S procedure, the job variable name being submitted as a procedure parameter:

Contents of procedure file *DO.JVTEST*:

```

/          SET-PROC-OPT  JV-REPLACE=*AFTER-BUILTIN
/          DECL-PAR      JV-1(INIT=*PROMPT)
/          &(JV(JV-NAME=JV-1))  FILE-NAME=LST.JOB
/ERR:      IF-BLOCK-ERROR
/          WRITE-TEXT  C'*** Error &MC ***'
/
/          ELSE
/          WRITE-TEXT  C'*** Command &(&(JV-1)) executed ***'
/          END-IF
/END:      EXIT-PROC

```

Procedure execution:

```

/show-jv jv=cmd ----- (1)
%SHOW-FILE-ATTR
/call-proc do.jvtest,log=*yes
%          1 1 /SET-PROC-OPT  JV-REPLACE=*AFTER-BUILTIN
%          2 1 /DECL-PAR      JV-1(INIT=*PROMPT)
%JV-1: cmd ----- (2)
%          3 1 /SHOW-FILE-ATTR  FILE-NAME=LST.JOB ----- (3)
%          3 :N:$USER0001.LST.JOB
%:N:      PUBLIC:      1 FILE RES=          3 FREE=          3 REL=          3 PAGES
%          4 1 /FEHL:
%          4 1 / IF-BLOCK-ERROR
%          6 1 /ELSE
%          7 1 /WRITE-TEXT  C'*** Command SHOW-FILE-ATTR executed ***'
'*** Command SHOW-FILE-ATTR executed ** ----- (4)
%          8 1 /END-IF
%          9 1 /ENDE:
%          9 1 / EXIT-PROC
/

```

- (1) SHOW-FILE-ATTR is displayed as the contents of job variable CMD.
- (2) After invoking the procedure *DO.JVTEST*, the procedure parameter *JV-1* is prompted for and assigned the value *CMD*. The expression is replaced by the job variable value as ascertained by the builtin function *JV()*. The desired job variable name is passed to the builtin function via S variable *JV-1*.
- (3) The command *SHOW-FILE-ATTRIBUTES* is executed.
- (4) A nested expression is used at this point: A job variable is to be substituted, its name being derived from the expression to be substituted for S variable *JV-1*. As a result, the contents of job variable *CMD* are substituted.

2.6 Language for SDF output

All SDF output occurs in the language that has been set for the output of system messages. The syntax files supplied by Fujitsu Technology Solutions contain texts for the respective language codes (D=German, E=English). These texts are:

- command/statement-specific help texts
- help texts on data types
- SDF-specific messages (e.g. command input request “%KDO:” or “%CMD:”)
- identifiers used in guided dialog (names of input fields, identifiers of data types and their suffixes)

The system language is globally defined in the MSGLPRI system parameter. In addition, system administration can specify the desired language for each user ID in the user catalog; this entry supersedes the globally defined system language. Users may obtain the currently applicable setting by issuing the SHOW-USER-ATTRIBUTES command. The user may also change the system language for a particular task by means of the MODIFY-MSG-ATTRIBUTES command.

If the language code set is not defined in the syntax files activated by a task, i.e. the global information in the activated syntax files does not contain any general text for the language code set, then SDF uses the globally defined system language. It informs the user of this fact by means of message CMD0159.

If the activated syntax files do contain global information for the language code set, then SDF outputs the command/ statement-specific help texts defined for this language code. Any help texts that may not be defined for this language code are output in the globally defined system language.

2.7 Return codes

SDF provides the user with information on the analysis of command input and execution in the form of a command return code. This command return code is comparable to return codes at program level. It enables users to take specific action in response to typical error situations.

2.7.1 Structure of command return codes

Command return codes consist of three parts:

- the maincode, a message code that can be specified with the HELP-MSG-INFORMATION command in order to obtain detailed information.
- subcode 1, which assigns the error situation to an error class that indicates how serious an error is. Subcode 1 has a *decimal* value. The following five error classes are defined in BS2000:
 - Class A: no error
The value is zero. Processing can proceed normally.
 - Class B: syntax error
The value is a number between 1 and 31. The command was entered with incorrect syntax. The command can be entered again after the syntax error has been corrected.
 - Class C: internal error (system error)
The value is 32. Input can be repeated if the internal error has been recovered.
 - Class D: errors that cannot be assigned to any other error class.
The value is a number between 64 and 127. Evaluate the maincode to determine how to proceed.
 - Class E: the command cannot be executed at the moment.
The value is a number between 128 and 130. Command input can be repeated without modification. The wait time may be short, long or indefinite. 128 indicates a short wait time, considered practical in interactive mode. 129 indicates a long wait time, considered practical in batch mode.
130 indicates an indefinite wait time and uncertainty as to whether the error will be recovered at all.

- subcode 2, which can contain additional information (value is not zero). Subcode 2 has a **decimal** value. In the event of an error (subcode 1 is not zero), there are no rules regarding the use of subcode 2. The value of subcode 2 may be zero, 1 or 2 if no error has occurred.

Subcode 2 with the value 1 indicates that the requested function was already available before the command was issued. Subcode 2 with the value 2 indicates an exception situation and should be classified as a warning.

Command return codes can only be evaluated with SDF-P resources in S procedures and dialog blocks (see the “SDF-P” manual [34]). For information on evaluation see also the descriptions of the IF-BLOCK-ERROR command and of the builtin functions MAINCODE, SUBCODE1 and SUBCODE2 in [section “Builtin functions” on page 1-138](#).

Representation of command return codes

Command return codes are represented in tabular form in the order: subcode 2, subcode 1, maincode, meaning. A subcode 2 with the value zero (i. e. no additional information present) is not listed in the table. If messages are guaranteed in a table for a specific command return code, the heading “Meaning” is supplemented by “/Guaranteed messages”, and the message codes of the guaranteed messages are given after the meaning. The user can output the meanings of these message codes with the HELP-MSG command.

Example

(SC2)	SC1	Maincode	Meaning/Guaranteed messages
1	0	CMD0001	Command terminated without errors
	32	CMD0500	Incorrect syntax description in current syntax file Guaranteed message: CMD0500
	64	CMD0554	Command execution not successful. Guaranteed message: CMD0300, CMD0302, CMD0490, CMD0508, CMD0509, CMD0552, CMD0554, CMD0555, CMD0579

2.7.2 General command return codes

Command return codes which a BS2000 command may pass upon execution are part of the respective command descriptions. The table below contains general command return codes that are automatically passed by SDF if

- SDF senses an error prior to command execution (e.g. syntax error)
- the command cannot be executed
- the command, i.e. the execution module itself, does not pass a command return code. In this case the command description does not contain any specific command return codes.

(SC2)	SC1	Maincode	Meaning
	0	CMD0001	No errors
	0	CMD0002	Command executed with warning ⁴⁾
1	0	CMD0026	Command no longer supported
2	0	CMD0093	Procedure ended in test mode ¹⁾
2	0	CMD0201	End of file reached ¹⁾
2	0	CMD0214	End of program ³⁾
	1	CMD0211	SDF transfer area too small
	1	CMD0202	Syntax error ^{5) 6)}
	1	CMD0205	SPIN-OFF ^{1) 2)}
	1	CMD2201	Internal parameter error
	2	CMD0200	Command presently not available
	2	CMD2202	Subsystem not defined
	3	CMD2203	Installation error
	32	CMD0221	Internal SDF error
	32	CMD2009	Error during output to variables
	32	IMO9101	Internal error in IMON-GPN
	64	CMD0216	Requisite privilege missing
	64	IMO9100	Installation unit, version or logical name not found, etc.; the cause can be found in the SYSOUT message
	65	CMD2241	Subsystem not loaded
	66	CMD2242	Subsystem not connected
	128	CMD2280	Subsystem not available for a short period
	129	CMD2281	Subsystem not available for a long period
	130	CMD2282	Subsystem not available for an indefinite period
	130	NBR0748	After /SHUTDOWN, the only command that can be entered at the operator terminal is /SHOW-PENDING-MSG

- 1) Command return codes CMD0093, CMD0201 and CMD0205 are not possible if the command is issued via the CMD macro.
- 2) Command return code CMD0205 is passed if spin-off was initiated. Example: end of program with TERM macro call with UNIT=STEP, and no command return code has been set with the CMDRC macro call during the program run.

- 3) Command return code CMD0214 cannot be passed to the calling program by the CMD macro because the program has been terminated by CMD macro execution.
- 4) Command return code CMD0002 is passed by SDF if a command triggers spin-off despite error-free execution. This compatibly supports the previous spin-off behavior of commands (and thus error handling in non-S and ENTER procedures). In S procedures in which ERROR-MECHANISM=*BY-RETURNCODE applies (see the SET-/MODIFY-PROCEDURE-OPTIONS command), error recovery is not initiated automatically since the related subcode 1 has the value zero.
- 5) Command return code CMD0202 is passed by SDF if a command does not initiate spin-off on errored execution. CMD0202 indicates syntactical and semantic errors detected during command execution. This compatibly supports the previous spin-off behavior of commands (and thus error handling in non-S and ENTER procedures). In S procedures in which ERROR-MECHANISM=*BY-RETURNCODE applies (see the SET-/MODIFY-PROCEDURE-OPTIONS command), error recovery is initiated since the related subcode 1 has a value other than zero.
- 6) Command return code CMD0202 is passed by SDF from the execution module for both syntactical and semantically errors.

Notes

- In user programs the CMDRC macro call can be used to set a command return code. This return code is retained up to the next CMDRC macro call. On program termination the current command return code from the program is passed to the caller and triggers error recovery in S procedures for subcode 1 with a value other than zero if ERROR-MECHANISM=*BY-RETURNCODE was specified (see the SET-/MODIFY-PROCEDURE-OPTIONS command).
- Return codes set within the program can be evaluated like command return codes after each statement (see the BEGIN-BLOCK command in the “SDF-P” manual [34]).

2.8 Conditional expressions (job variables)

A conditional expression is used to render the processing of commands ADD-CJC-ACTION, SKIP-COMMANDS or WAIT-EVENT dependent on job variable values. A conditional expression may be “true” or “false”. It consists of one or more relational expressions `<relation.expr>`, which have the following structure. Alternative expressions are separated by “/”; freely selectable specifications are enclosed in square brackets. The use of special job variables in conditional expressions is permitted only with the SKIP-COMMANDS command.

<code><relation.expr></code>	::=	<code>(<term> <comparative-op> <term>)</code>
<code><term></code>	::=	<code><jvid> / <jv-substring-def> / <const></code>
<code><comparative-op></code>	::=	<code>< </ > / = / <= / >= / <> /</code> <code>LT / GT / EQ / LE / GE / NE</code>
<code><jvid></code>	::=	<code><jvname> / <*jvlink> / <#jvname> / <special-jvname></code> As CJC compares at most 64 bytes, <code><jvid></code> is equivalent to specifying <code>(<jvid>,1,64)</code> .
<code><jvname></code>	::=	Name of a permanent user job variable
<code><*jvlink></code>	::=	Link name of a user job variable with leading asterisk(*)
<code><#jvname></code>	::=	Name of a temporary user job variable
<code><special-jvname></code>	::=	Name of a special job variable without a catalog ID, but with the user ID SYSJV specified
<code><jv-substring-def></code>	::=	<code>(<jvid> [, [<start>], [<length>]])</code>
<code><start></code>	::=	<code><integer 1..256></code> default= 1
<code><length></code>	::=	<code><integer 1..64></code> default=64 <code>(<start> + <length> ≤ 257)</code>
<code><const></code>	::=	<code><c-string 1..64> / <x-string 1..128></code> for example: <code>C'HALLO' or 'HALLO' or X'00FF' or X'0FF'</code>

Note

If required ACS replaces the alias of a JV specified in `<jv-name>` by its real path name (in accordance with the alias catalog entry).

The operators LT, GT, EQ, LE, GE and NE must be separated by a blank from constants, JV names or link names. It should be noted in particular that uppercase and lowercase letters are retained in conditional expressions. Complex conditional expressions are formed by combining relational expressions with the help of logical operators:

```
<cond.expr> ::= (<relation.expr> <logical.op> <relation.expr> /
                <cond.expr> <logical.op> <cond.expr> /
                NOT <cond.expr>

<logical.op> ::=      AND      /      OR      /      XOR
                   logical and /      logical or /      exclusive or
```

Example

```
(JV1=C'START')
((JV2=C'O.K.') AND (*LINK<=C'12'))
(((JV4,10,3)=C'NEU') OR (#TEMP.JV=C'Y') AND (*LINK2=X'00'))
```

Note

A conditional expression is evaluated “from the lowest to the highest level” within the parentheses. At the same level within the parentheses, the logical operations are performed in the following order:

1. NOT
2. AND
3. OR
4. XOR

The following expression, for instance,

```
(NOT (JV1=C'ABC')) OR (JV2=C'Z') AND (JV3<>JV4))
```

is evaluated as if it had been expressed as follows

```
((NOT (JV1=C'ABC')) OR ((JV2=C'Z') AND (JV3<>JV4)))
```

When compared with job variable values, a few limitations become evident:

- The evaluation of relational expressions proceeds bitwise from left to right. The result of a comparison is determined by the EBCDIC bit pattern for the given values. Thus, for example, the printable digits 0 to 9 (X'F0' to X'F9') are “greater” than the letters A ... Z (X'C1' ... X'E9'), and uppercase letters are greater than lowercase letters.
- If the comparison value lies outside the defined range of a job variable or the job variable is empty (e.g. after declaration), the results of comparison are “false” in every case, even the test was for “not equal” (<>).

Example

The following expressions are “true”

```

C' ' < C'A'
C'a' < C'A'
C'A' < C'B'
C'B' < C'BB'
C'GOOD DAY' < C'GOOD NIGHT'
C'ZZZZZZZZ' < C'O' (!)
C'8' < C'9'
C'899999999' < C'9' (!)
X'81' < X'C1'
X'0123' < X'0124'
X'C1' < X'C100'
X'FOFOFOFO' < X'F1'
X'3FFF' < C' '

```

The response to the following queries is “false”.

```

(IN) CALL-PROC PROC.JV
(IN) /BEG-PROC LOG=*ALL
(IN) /CRE-JV JV=JV1
(IN) /SKIP-COMMAND TO-LABEL=END,IF=JV(COND=((JV1,11,1) NE '2'))
(OUT) % CJC0011 SKIP-COMMANDS: CONDITION = FALSE
(IN) /MOD-JV JV=(JV-NAME=JV1,POS=1,LENGTH=5),SET-VALUE=C'12345'
(IN) /SKIP-COMMAND TO-LABEL=END,IF=JV(COND=((JV1,6,2) EQ 'A1'))
(OUT) % CJC0011 SKIP-COMMANDS: CONDITION = FALSE
(IN) /SKIP-COMMAND TO-LABEL=END,IF=JV(COND=((JV1,6,2) NE 'A1'))
(OUT) % CJC0011 SKIP-COMMANDS: CONDITION = FALSE
(IN) /.END END-PROC

```

A conditional expression will be rejected in the following cases:

- A JV to which reference is made cannot be accessed (catalog destroyed).
- A JV to which reference is made is not present in the specified catalog.
- The user does not have authorization to access a password-protected or nonshareable JV.

2.9 System files

The (standard) file names SYSDTA, SYSSTMT, SYSCMD, SYSIPT, SYSLST, SYSLST01, SYSLST02, ..., SYSLST99, SYSOPT and SYSOUT designate (system) files used by the operating system for data and command input to the operating system and for data output by the operating system. These files are created in each case by the task and initially designate (primary) specified input or output areas.

Users may cancel the primary assignment and assign their own cataloged files or complex S variables (when the SDF-P software product is used) to the (standard) file names.

The following **system files** are available to a job for **input**:

- | | |
|---------|---|
| SYSCMD | Commands given by users to control the execution of their jobs are expected from SYSCMD. During the processing of the commands, i.e. in command mode (system mode), SYSCMD is active. |
| SYSDTA | The system file SYSDTA is used for the input of input data, i.e. data, parameters and statements, which a program reads in without the SDF interface (see the CMDRST or RDATA macro in the “Executive Macros” manual [22]). SYSDTA is active the moment a program begins execution, i.e. in program mode. |
| SYSIPT | This system file is only still available for reasons of compatibility and is consequently no longer described. |
| SYSSTMT | This system file is used for the input of statements to programs. The statements must be defined in a syntax file (see the “SDF-A” manual [33]). The allocation made for the system file SYSDTA also applies for system file SYSSTMT. The continuation lines, continuation characters and comments used when entering SYSSTMT statements must comply with the rules for SYSCMD command entry. |

The following **system files** are available to a job for **output**:

- | | |
|--------|--|
| SYSOUT | The system directs logging messages and error messages arising during the currently executing job to SYSOUT. Utility routines and compilers also use SYSOUT in this way.
File name on primary allocation: <i>S.OUT.tsn.yyyy-mm-dd.hhmmss.nnnn</i>
If the system parameter SSMMILOG=Y is set during allocation to a PLAM library member then the output records are also written to the file <i>S.OUT.lib.elem.tsn.nnnn</i> . |
|--------|--|

- SYSLST** In general larger data sets, such as memory dumps and listings generated by utility routines and compilers, are written to the system file SYSLST. In addition, SYSLST may contain records from the SYSOUT system file, if desired (specify LOGGING in the SET-LOGON-PARAMETERS or MODIFY-JOB-OPTIONS command).
File name on primary allocation: *S.LST.tsn.yyyy-mm-dd.hhmmss.nnnn*
If the system parameter SSMMILOG=Y is set during allocation to a PLAM library member then the output records are also written to the file *S.LST.lib.elem.tsn.nnnn*.
- SYSLST01, SYSLST02, ..., SYSLST99** Unlike the system file SYSLST, these system files do not have their own EAM area for storing output data. They are used for buffering and are operative only when cataloged files are assigned to them.
- SYSOPT** This system file is only still available for reasons of compatibility and is consequently no longer described.

Meaning of the file name parts:

tsn	TSN of the task (4 characters)
yyyy-mm-dd	File creation date where mm=month, dd=day of the month, yyyy=4-digit year specification
hhmmss	File creation time where hh=hours, mm=minutes and ss=seconds
nnnn	4-digit counter
lib	First 7 characters of the PLAM library
elem	First 7 characters of the element name

The system files for output are normally output when a job is ended (EXIT-JOB or LOGOFF command) if no cataloged file or a complex S variable has been assigned to them and output was not suppressed on job termination. Depending on the setting of the system parameter SSMOUT, the files are output to printer or sent by email. If they cannot be sent by email, they are output to printer. Before the job has been completed, the system file can be output to printer using the PRINT-DOCUMENT command or sent by email using the MAIL-FILE command. Using the COPY-SYSTEM-FILE command, the system file SYSLST can also be copied to a file if SYSLST has the primary assignment.

In the PRINT-DOCUMENT and DELETE-SYSTEM-FILE commands, the (standard) file names SYSOUT and SYSLST may also be specified when cataloged files or complex S variables have been assigned to them. SYSLST and SYSOUT are rejected in the MAIL-FILE command if an S variable is assigned to them.

Accessing system files

With the help of system files, user programs can input and output data. The system file SYSCMD represents an exception; it is accessible only to the system via privileged macros. The following table lists the macros and statements required to access system files.

System file	Macros that access system files Assembler	Language statements referring to system files:			
		COBOL	FORTRAN	PL/I	RPG3
SYSCMD	privileged	-	-	-	-
SYSDTA	RDATA	ACCEPT dataname FROM TERMINAL	READ (1,... READ (5,... READ (97,...	GET without FILE option	(DEVICE=) READER, no explicit statement
SYSSTMT	CMDRST ¹⁾	1)	1)	-	-
SYSIPT ²⁾	-	-	-	-	-
SYSOUT	WROUT	DISPLAY dataname UPON TERMINAL	WRITE (2,...	DISPLAY dataname (without REPLY)	DSPLY
SYSLST	WRLST	DISPLAY dataname; DISPLAY dataname UPON SYSLST	WRITE (6,... WRITE (99,...	PUT without FILE option	(DEVICE=) PRINTER, no explicit statement
SYSOPT ²⁾	-	-	-	-	-

Table 6: Accessing system files

- 1) There exists a High-Level Languages program interface for the programming languages C, COBOL and FORTRAN. The functions of the most important SDF macros (such as RDSTMT, CORSTMT and TRSTMT) are supported in function calls (see the "SDF-A" manual [33]).
- 2) The system files SYSIPT and SYSOPT are only still available for reasons of compatibility.

Primary assignment and redirection of system files

In general, a specific assignment for the system files is preset. With the help of commands, this primary assignment can be changed; the following table provides an overview of this. Examples may be found in the descriptions of the commands involved.

System file	Primary assignment	Further assignments	Commands for changing the assignment
SYSCMD	in dialog: terminal in batch: spoolin file (S.IN.), spooled in via magnetic tape device or ENTER file.	cataloged disk file (SAM/ISAM), library member or complex S variable	CALL-PROCEDURE: assignment to a cataloged file, a library member or a complex S variable End of procedure: assignment in effect when the last procedure was exited.
SYSDTA	same as SYSCMD primary assignment	cataloged file (SAM/ISAM), library member, complex S variable	ASSIGN-SYSDTA: assignment to a cataloged file, to a library member, to a complex S variable, to SYSCMD or back to the primary assignment. End of procedure: assignment in effect when the last procedure was exited.
SYSSTMT	same as SYSDTA primary assignment	same as SYSDTA	same as SYSDTA
SYSIPT	This system file is still provided for reasons of compatibility.	-	-
SYSOUT	in dialog: terminal in batch: temporary spoolout file (S.OUT.) which at the end of the job is printed out or sent by email and then deleted	cataloged file (SAM/ISAM), library member or complex S variable; no automatic printout or transfer by email	ASSIGN-SYSOUT: assignment to a cataloged file, to a library member, to a complex S variable, to SYSCMD or back to the primary assignment. End of procedure: assignment in effect when the last procedure was exited.

Table 7: Primary assignment and redirection of system files (Part 1 of 2)

System file	Primary assignment	Further assignments	Commands for changing the assignment
SYSLST	temporary spoolout file (S.LST.) which at the end of the job is printed out and then deleted (created only when needed)	cataloged file (SAM), library member or complex S variable; no automatic printout or transfer by email	ASSIGN-SYSLST: assignment to a cataloged file, to a library member, to a complex S variable, to SYSCMD or back to the primary assignment. End of procedure: assignment in effect when the last procedure was exited.
SYSLST01 ... SYSLST99	current assignment of SYSLST	same as SYSLST; also possible between each other	same as SYSLST
SYSOPT	This system file is still provided for reasons of compatibility.	-	-

Table 7: Primary assignment and redirection of system files (Part 2 of 2)

Termination of the procedure and the resultant change in assignment can be explicitly effected by means of an EXIT-PROCEDURE, CANCEL-PROCEDURE or END-PROCEDURE command (only non-S procedures). A procedure is implicitly terminated on reaching end of file (EOF condition).

2.10 Job switches

Every job in BS2000 has available to it job-specific switches, which can only be changed or queried when that job is executing (note in this regard: user switches are user-ID-specific, see the MODIFY-USER-SWITCHES command). There are 32 job switches (numbered 0 to 31) available per job. Each of these switches may be given a value of 0 or 1. At the beginning of the job, all job switches are cleared (setting: 0). While the job is executing, these switches can be changed:

- **explicitly**, using the MODIFY-JOB-SWITCHES command
- **implicitly**, using the SET-JOB-STEP command (resets switches 16 to 31) or using utility routines (software products)

At the end of the job, all job switches are cleared again.

The following table shows which software products normally use job switches:

Software product	Job switches
ARCHIVE	30, 31
BCAMDEF	1, 4, 5, 20, 31
DAMP	5, 30
EDT	4 bis 7
FMS	5
LMS (ISP)	1, 4, 9
LMS (SDF)	4, 31
PRSERVE	0, 2, 3
SDF-A	15
TSOSLNK	4

Table 8: Job switches used by software products

The following applies here:

Setting switch 4 causes the BLS0500 message from the binder loader to be suppressed.

ARCHIVE

Information regarding the course of the process may be obtained from the setting of the switches that ARCHIVE sets during/after the run.

Switch 30 set by ARCHIVE: Warning message in procedures

Switch 30 is set by ARCHIVE when the ARCHIVE statement was executed but a warning message was issued.

Switch 31 set by ARCHIVE: Errors in procedures

Switch 31 is set by ARCHIVE when an error was detected but the ARCHIVE statement was nevertheless executed.

BCAMDEF

Switches 0, 4, 5, 31 are used:

Within the BCAMDEF procedure, switches 0, 4, 5, 31 are set and then cleared again.

DAMP

Switch 5 set for DAMP

Before the DAMP program is called, task switch 5 must be set in the procedure.

If, in procedure mode, a DAMP statement is followed by a system command that is not permitted at the DAMP program level, DAMP switches from procedure mode to interactive mode and resets task switch 5. The last DAMP output screen is then displayed on the screen. In batch mode, a system command which is not permitted causes the job to be aborted.

Switch 30 set for DAMP

Suppresses a dump (user dump) if DAMP terminates in case of a program or system error:

- In interactive mode, a message is issued asking whether a dump should be generated.
- In batch mode, no dump is generated.

EDT

Switch 4 set for EDT: Suppress start and end messages

Setting this switch causes the message BLS0500 following the loading of EDT to be suppressed. When EDT is terminated, message EDT8000 and, where applicable, messages EDT0900 and EDT0904 are also suppressed. In batch mode, the message @LOG NONE is suppressed.

Switch 5 set for EDT: Activate edit-only mode

When this switch is set, EDT reads via RDATA and not via WRTRD, i.e. EDT operates in edit-only mode.

Switch 6 set for EDT: 160 print positions per line

If this switch is set, EDT writes, to SYSLST, 160 print positions in one line, and writes any remainder in the following record. Normally, EDT uses 132 print positions and writes any remainder in the following record.

Switch 7 set for EDT: Excess memory space is not released

Setting switch 7 prevents the automatic release by EDT of excess memory space that was initially allocated. Normally, EDT releases unoccupied memory space.

FMS

Switch 5 set for FMS: FMS suppresses interactive queries

LMS

Switch 1 set for LMS (ISP only): Alternative input of statements

In interactive mode, unless otherwise specified, statements to LMS are read from the interactive terminal by means of the WRTRD macro. When switch 1 is set, statements are read with the RDATA macro, from the file assigned to the SYSDTA system file.

Switch 4 set for LMS: Suppress start and end messages

Setting switch 4 causes the LMS start and end messages to be suppressed. At the same time, the runtime log of LMS is reduced to the minimum.

Switch 9 set for LMS (ISP only): Request additional memory space

Setting switch 9 makes it possible to process up to 1200 records of different length in one comparison, and to continuously sort larger directories with the TOC function.

Switch 31 set for LMS: Set test condition for diagnostic purposes (see the “LMS” manual [21]).

PRSERVE

Switch 0 set for PRSERVE: Suppress output of the character frame

Setting switch 0 causes output of the secondary statement indicator (character frame) to SYSOUT to be suppressed. However, this is unrelated to the screen display, produced by means of the DISPLAY statement.

Switch 2 set for PRSERVE: Suppress output of the LOOP record

Setting switch 2 causes the output of the LOOP record (following a CHECK statement) in interactive mode to be suppressed.

Switch 3 set for PRSERVE: Suppress information regarding the current mode of operation

Unless otherwise specified, the user receives from PRSERVE an error message and information regarding the currently active operational status after an incorrect PRSERVE statement has been entered. By setting switch 3, output of the information is suppressed.

SDF-A

Switch 15 set for SDF-A: Process syntax files in the old format

Syntax files in the old format (supported by SDF V1.4) are processed without being automatically converted into the new format. However, this means that only the syntax and functionality of SDF-A V1.0D are available.



By default, reference syntax files are not assigned, i.e. *NO applies rather than *CURRENT. Only reference syntax files in the old format can be explicitly assigned. It is not possible to generate new system syntax files or output syntax file objects.

TSOSLNK

Switch 4 set for TSOSLNK: Suppress page feed

Setting switch 4 causes all page feeds to be omitted when the linkage editor listing is output on SYSLST.

2.11 Device type table

The manual „System Installation“ [46] contains a device type table with all codes which are required for the BS2000 operating system. For information on which devices are currently supported, please refer to the Release Notice.

Volume type table

Volume type code	Volume type	Meaning
A9	NETSTOR	Net-Storage volume in DMS commands and macros (there is no device type code for this)
B4	T6250 / T9G	(Emulated) long tape with recording density of 6250 bpi (CD, DVD or file) (device type code: E8)
B7	TAPE-C5	128-track tape cartridge (device type code: C5)
BB	TAPE-C3	36-track tape cartridge (device type code: C4)
BC	TAPE-C4	36-track tape cartridge, compressed (device type code: C4)
BF	TAPE-C6	256-track tape cartridge (device type code: C6)
C7	TAPE-U4E	896-track tape cartridge, data is written in encrypted form, see the "MAREN" manual [23] (device type code: CE)
C8	TAPE-U5E	1280-track tape cartridge, data is written in encrypted form, see the "MAREN" manual [23] (device type code: CF)
CB	TAPE-U1	384-track tape cartridge (device type code: CB)
CC	TAPE-U2	512-track tape cartridge (device type code: CC)
CD	TAPE-U3	704-track tape cartridge (device type code: CD)
CE	TAPE-U4	896-track tape cartridge, data is written in encrypted form, see the "MAREN" manual [23]. (device type code: CE)
CF	TAPE-U5	1280-track tape cartridge, data is written in encrypted form, see the "MAREN" manual [23]. (device type code: CF)

Table 9: Assignment of volume type code to volume type

2.12 DMS volume types

During file processing DMS requests the required volumes using the VSN and device type in device management. Strictly speaking the device type which is used in DMS specifies the volume type.

For a requested volume type the device management provides a device of the appropriate device type. In the case of tapes/MTCs, the volume is mounted on the device provided. In the case of disks, the volume is already "mounted" on the device (here the volume and device type are identical).

2.12.1 Volume type for Net-Storage

Net-Storage is made available to the BS2000 system by means of one or more Net-Storage volumes which extend a pubset. While the Net-Storage volume on the net server corresponds to a directory in the file system released for BS2000, from the BS2000 viewpoint it is a disk.

In contrast to "normal" BS2000 disks, in BS2000 no device exists on which a Net-Storage volume could be mounted. Consequently Net-Storage volumes are not generated.

The volume type NETSTOR (internal type A9) must be specified in the DEVICE-TYPE (or TYPE) operand for a Net-Storage volume.

2.12.2 Device types for DMS tape processing

When tape files are processed, device requests are made via the volume type specification in the DEVICE-TYPE operand. Device management then supplies a device that supports the specified volume type. The following values can be specified in the DEVICE-TYPE (or TYPE) operand:

Command	Permissible specifications for the volume type in the DEVICE-TYPE or TYPE operand		
	TAPE T6250	WORK	TAPE-C3/C4/C5/C6/ U1/U2/U3/U4/U4E/U5/U5E
CREATE-FILE	X	X	X
CREATE-FILE-GENERATION	X	X	X
CREATE-TAPE-SET	X		X
EXTEND-TAPE-SET	X		X
MODIFY-FILE-ATTRIBUTES	X		X
MODIFY-FILE-GENERATION-SUPPORT	X		X
IMPORT-FILE	X		X
SECURE-RESOURCE-ALLOCATION	X	X	X

Table 10: Device types for DMS tape processing

The overview below indicates which devices (see device table for device types) can be assigned to the various volume types.

Volume types for magnetic tape devices

T6250	9-track tape devices which support a recording density of 6250 bpi (bytes per inch); (T9G is a synonymous volume type)
TAPE	9-track tape devices independent of the supported recording density: same device types as for T6250
WORK	9-track tape devices independent of the supported recording density: same device types as for T6250 A device on which a work tape is mounted is assigned (assignment of a VSN can only be performed by the operator). A work tape is not normally archived, and it is therefore a good idea to only use it for output data that is no longer required after processing. <i>No</i> owner is entered in the VOL1 label, i.e. the volume is not protected against unauthorized access.

Volume types of magnetic tape cartridge devices (MTC)

TAPE-C3	MTC (device type 3590E) 36-track
TAPE-C4	MTC (device type 3590E) 36-track, compressed recording MTC (device type 3590E) 128-track, emulated
TAPE-C5	MTC (device type 35991) 128-track
TAPE-C6	MTC (device type 3591E) 256-track
TAPE-U1	MTC (device type LTO-U1) 384-track
TAPE-U2	MTC (device type LTO-U2) 512-track
TAPE-U3	MTC (device type LTO-3) 704-track
TAPE-U4	MTC (device type LTO-U4) 896-track, Data is written in unencrypted form, (see the „MAREN“ manual [23])
TAPE-U4E	MTC (device type LTO-U4E) 896-track, Data is written in encrypted form, (see the „MAREN“ manual [23])
TAPE-U5	MTC (device type LTO-U5) 1280-track, Data is written in unencrypted form, (see the „MAREN“ manual [23])
TAPE-U5E	MTC (device type LTO-U5E) 1280-track, Data is written in encrypted form, (see the „MAREN“ manual [23])

An overview of the devices which are supported by the current version of BS2000 operating system is contained in the device table in the “System Installation” manual [46]). For information on which devices are currently supported, please refer to the Release Notice.

2.13 Information services of device management: Meanings of the output values of SHOW commands

The NDM information services provide the operator with certain output fields appropriate to the specified command and the desired scope of information. The various output formats are described with the command concerned. The meaning of the output fields is described below in alphabetical order.

Information is supplied for the following commands (the abbreviated names are used in the table):

Command	Abbreviated name
SHOW-DEVICE-CONFIGURATION	SH-DEV-CONF
SHOW-DEVICE-DEPOT	SH-DEV-DEPOT
SHOW-DEVICE-STATUS	SH-DEV-STA
SHOW-DISK-DEFAULTS	SH-DISK-DEF
SHOW-DISK-STATUS	SH-DISK
SHOW-MOUNT-PARAMETER	SH-MOUNT
SHOW-RESOURCE-ALLOCATION	SH-RES
SHOW-RESOURCE-REQUESTS	SH-RES-REQ
SHOW-TAPE-STATUS	SH-TAPE

Keyword	Meaning	Used in command
ACCESS	= WRITE Read and write access to the disk is permitted. = ALL The disk is not yet allocated. Only when the disk is allocated is ACCESS=WRITE set.	SH-DISK (INF=PAR)
ACTION	Shows which (re)mount operation is being performed for a volume by volume monitoring. This can have been initiated by one of the following actions: <ul style="list-style-type: none"> – operator intervention (inadvertently dismounting a volume that is in use) – commands (DETACH-DEVICE, CHANGE-DISK-MOUNT ACTION=MOVE,...) – Device Error Recovery (DER) e.g. with INOP – user request (mount message for volumes that have not yet been mounted) The following states are possible: CANCELLED: A tape or disk is permanently locked; the interrupt is not cleared.	SH-RES SH-DEV-STA SH-DISK SH-TAPE

Keyword	Meaning	Used in command
	DISMOUNT: A remount message has not been received for the same volume on another device, or a remount, mount or premount message has not been received for another volume on the same device.	
	INOP: The device is temporarily unavailable (inoperable).	
	MOUNT: The response to a mount message has not been received for the relevant volume.	
	NO ACTION: No interrupt.	
	NO DEVICE: There no longer exists a device allocation for a volume owing to a previous reconfiguration command (DETACH-DEVICE, REMOVE-DEVICE-CONFIGURATION); processing of the volume is interrupted until a standby device is provided.	
	POSITION: A tape in use is being repositioned.	
	PREMOUNT: The response to a PREMOUNT message has not been received for the relevant volume.	
	RECOVER: An interrupt procedure which is not specified in more detail is being carried out for the volume in use.	
	REMOUNT: The volume is being remounted.	

continued ➡

Keyword	Meaning	Used in command
ACTION (continued)	SVL-UPDATE: The system allocation log is being stored on disk.. SNATCHED: The allocation which was passed to another task has been revoked by the device owner. UNLOCK: An UNLOCK job for the removal of a system ID stored in the SVL is being executed. WP-MISSING: The write-enable ring for a tape is to be mounted or the write protection for a disk is to be canceled.	
ADMISSION-TIME	Date and time of day at which the task entered the secure queue(yyyy-mm-dd hh:mm:ss)	SH-RES-REQ
ALIAS1 ALIAS2 ALIAS3	Shows the mnemonic alias name of a PAV device in the format <mnemo-name>-xy. Up to three alias names are possible. The status indicator xy means: x = P for "preferred" devices or '-' for other devices y = R for "ready" or N for "not ready"	SH-DEV-CONF (INF=PAV)
ALLOC	Indicates whether the relevant disk is allocated or not. YES: Disk is allocated. NO: Disk is not currently allocated.	SH-DISK
ALLOCATE-TAPE	Indicates whether the system will execute the allocation of tapes already online without the support of the operator (without a mount message). YES: Premount, mount and remount messages are answered automatically by the system, provided the tape is recognized as online. NO: Premount, mount and remount messages must be answered by the operator.	SH-MOUNT
ASS[IGN]-TIME	For a private disk in the USE=DMS mode, this shows the time at which it is allocated or released (SH-DISK INF=PAR). For SH-DISK-DEF, the value for ASSIGN-TIME shows the time of disk allocation or release for all disks for which this value has not been set explicitly.	SH-DISK (INF=PAR) SH-DISK-DEF
ATT[ACH]	Number of devices in the "attached" state belonging to the device type specified in the output (independent of allocation)	SH-DEV-STA (INF=SUM)
AVAIL	Number of devices of the device type defined in the output which are still free (available)	SH-DEV-STA (INF=SUM)
BASE	Shows the mnemonic base name of a of a PAV device in the format <mnemo-name>-xy. The status indicator xy means: x = P for "preferred" devices or '-' for other devices y = R for "ready" or N for "not ready"	SH-DEV-CONF (INF=PAV)

continued ➡

Keyword	Meaning	Used in command
CAR	<p>Shows the state of the CARTRIDGE-LOADER of the MTC devices from the point of view of BS2000. The state ascertained last is displayed. It is updated at ATTACH or during device selection.</p> <p>The device's control panel may indicate a different operating mode, e.g. because device management sets its internal state to MANUAL when dismounting the magazine, or because the magazine has not been locked after mounting.</p> <p>The following states are possible:</p> <p>AUT Automatic Mode</p> <p>MAN Manual Mode</p> <p>ON Devices of type 3580 / 3590 / 3590E: Device with volume stacker; the stacker is active</p> <p>OFF Devices of type 3580 / 3590 / 3590E: Device with volume stacker; the stacker is not active</p> <p>RAN Random Access Mode</p> <p>SEQ Sequential Access Mode</p>	SH-TAPE (INF=CAR)
CONF-STATE	<p>Configuration state of the specified device; serves as indicator of the availability of the device. The following states are possible:</p> <p>ATTACHED: The device is available to the system for input/output. A distinction is made between ATT(EXplicitly) and ATT(IMplicitly).</p> <p>ATTACHED *: The device is attached but not assigned. The ROBAR product decides on the basis of the displayed state whether the mount request for a volume is to be permitted or rejected.</p> <p>DETACHED: The device is not available to the system for input/output. A distinction is made between DET(EXplicitly) and DET(IMplicitly).</p> <p>ATT-PENDING: The device is not yet available to the system for input/output.</p> <p>DET-PENDING: The device is declared unavailable for the system at the end of usage.</p> <p>INVALID: The device cannot be accessed via any path and cannot be reconfigured.</p> <p>For device classes CPU and CHANNEL the hardware state is also shown by SH-DEV-CONF.</p>	SH-DEV-STA SH-DEV-CONF

continued ➡

Keyword	Meaning	Used in command
CTL CHPID CUU	Inner virtual connection of the device via the controller (CTL) to the channel (CHPID).	SH-DEV-CONF (INF=PATH)
CUU	Path addresses (CHN, CTL, DVC) to a device.	SH-DEV-CONF (INF=PATH)
DET	Number of generated devices of the specified type which are not available as they are in the configuration state "detached".	SH-DEV-STA (INF=SUM)
DET-P	Number of devices of the particular type which are still required by the system for user requests and which are to assume the "detached" state after their release. Reallocation of these devices is not possible.	SH-DEV-STA (INF=SUM)
DEV-A	Type of device allocation: (See VOL-A for meaning of values) FREE The device is not yet allocated; it is available for allocation. DMS The specified device is implicitly allocated by a DMS application on the private disk mounted on it. PUBLIC The device is implicitly allocated by an active public disk mounted on it. PAGING The disk is used exclusively for paging. DMS-PAG The disk is used for paging and is also allocated as shareable by tasks. DRV The device is explicitly allocated by an action initiated by DRV. DMS-DRV The device is implicitly allocated by a DMS application on the private disk mounted on it as a DRV disk. PUB-DRV The device is implicitly allocated as a DRV disk by an active public disk mounted on it. DRV-PAG: The device in question is implicitly allocated as a DRV disk by an active paging disk mounted on it.	SH-DEV-STA SH-DISK SH-TAPE

continued ➡

Keyword	Meaning	Used in command
DEV-A (continued)	<p>=tsn TSN of the job that exclusively allocates the device</p> <ul style="list-style-type: none"> – In the case of a disk device, it was requested with SECURE-RESOURCE-ALLOCATION UNIT=... or the occupying job is using the allocated disk for a USE=SPECIAL application (PHASE=IN-USE/MOUNT) – In case of tape devices, the occupying task is using the allocated tape in any allocation mode (DMS, SPECIAL, WORK; PHASE=PREMOUNT/MOUNT/IN-USE). – For all other devices (e.g. printers), no distinction is made between USE modes. 	
DEV-TYPE	Device type of generation (D3480, 3590E,...) or volume type (tape processing) specified by the user for device allocation (e.g. T6250, TAPE-C4, TAPE-C6).	SH-RES SH-DEV-STA
DISK-MOUNT	<p>Indicates whether the operator is ready to perform disk mount operations.</p> <p>YES: The operator is ready to execute disk mount requests.</p> <p>NO: Requests for the mounting of new private disks are automatically rejected by the system.</p>	SH-MOUNT
DVC	Mnemonic device name of a specified hardware unit.	SH-DEV-CONF (INF=PATH)
FRMT	<p>Indicates the disk format:</p> <p>2kb: NK2 disk: the minimum transfer unit of the disk is 2KB.</p> <p>4kb: NK4 disk: the minimum transfer unit of the disk is 4KB.</p>	SH-DISK (INF=SYS)
INNER CONNECTION	<p>Describes the availability of the generated connections leading from the specified unit to all inner units that are directly connected to it (in the direction of CPU). The following states are possible: The following states are possible:</p> <p>INCLUDED: The connection (path) is available to the system for input/output. The WWN of the port is also displayed for a channel of the type FC.</p> <p>REMOVED: The path is not available to the system for input/output. A distinction is made between REM (EXplicitly) and REM (IMplicitly).</p> <p>REM-PENDING: The path is declared unavailable by the system after end of usage.</p>	SH-DEV-CONF (INF=INNER)

continued ➡

Keyword	Meaning	Used in command
LABEL	Describes the type of volume label (see SVL). The following values are possible: STD: The volume uses standard labels. TAPE-MARK: The tape starts with a tape mark. NON-STD: The label has neither of the above attributes.	SH-TAPE
LOC[ATION]	Provides information on the name of a depot (eight alphanumeric characters).	SH-DEV-DEPOT SH-DEV-STA SH-MOUNT SH-RES
MNEM	This field contains the mnemonic name of a device as defined at generation time.	SH-RES SH-DEV-STA SH-DISK SH-TAPE SH-DEV-CONF
NAME/ID	Provides information on the job name of the job referred to or on the user ID under which it is running.	SH-RES
OP-CTL OPERATOR-CONTROL	Specifies whether the operator wishes to be informed of new disk allocations by tasks (with the possibility of rejecting such allocation requests). The suffix "(D)" indicates that the data was taken from the DISK-DEFAULTS.	SH-DISK (INF=PAR) SH-DISK-DEF
OUTER CONNECTION	Describes the configuration state of the generated connections from the specified unit to all outer units directly connected to it (in the direction of the terminal). Possible values: see INNER CONNECTION.	SH-DEV-CONF (INF=OUTER/ALL)
PAMKEY	For disks, indicates whether use of the PAMKEY is permitted. YES: Use of PAMKEY is permitted. NO: Use of PAMKEY is not permitted.	SH-DISK (INF=SYS)
PATH	Describes the availability of a complete input/output path (from CHN via CTL to the device). AVAIL: Input/output path is available. N.AV: Input/output path is not available. N.OP Input/output path is not operational.	SH-DEV-CONF (INF=PATH)

continued ➡

Keyword	Meaning	Used in command
PHASE	<p>Describes the monitoring mode for tapes and disks. The following states are possible:</p> <p>ONLINE: The volume is mounted without being allocated.</p> <p>PREMOUNT: The state exists only for tapes. The volume is allocated; for this volume a device allocation exists for a previous or later usage. This state is initiated by:</p> <ul style="list-style-type: none"> – /SECURE-RESOURCE-ALLOCATION for implicit or explicit tape reservation with device allocation – /ADD-FILE-LINK; exists up to OPEN time – CLOSE macro; exists up to release of the TFT entry <p>If the tape is not yet mounted on a suitable device, the operator receives a premount request (see also ACTION).</p> <p>MOUNT: The volume is already allocated but must still be mounted by the operator.</p> <p>IN-USE: The volume is released for usage (except for ACTION=CANCELLED). For both of the allocation states IN-USE and PREMOUNT, volume monitoring takes place (a volume is always monitored if a valid allocation exists for it). Volume monitoring has the following functions:</p> <ul style="list-style-type: none"> – it guarantees a device allocation for tapes in the PREMOUNT state; – it requests the operator to make a volume available again which has been allocated but is currently not accessible (INOP); – it instigates clearing of a NO-DEVICE state once a device of the required type becomes free; – it initiates automatic repositioning of tapes in the event of illegal operator intervention (e.g. unloading the wrong tape device). 	SH-DEV-STA SH-DISK SH-TAPE SH-RES

continued ➡

Keyword	Meaning	Used in command
PHASE (continued)	<p>INVENTORY: Only for cartridge volumes in the magazine of an MTC device that can be operated in random access mode at the BS2000 system. Device management is taking stock of the cartridges in the magazine. No allocation will be made until stocktaking is complete.</p> <p>IN-CAR: Only for cartridge volumes in the magazine of an MTC device that can be operated in random access mode at the BS2000 system. The cartridge has been assigned to the magazine and is currently in the magazine or drive.</p> <p>OFF-CAR: Only for cartridge volumes in the magazine of an MTC device that can be operated in random access mode at the BS2000 system. The cartridge has been assigned to the magazine but is currently not in the magazine or drive.</p>	
PID	Device address for input/output operations. The PID (physical device ID) is updated after ATTACH.	SH-DEV-CONF
POOL	<p>Defines the availability of a device in relation to several systems:</p> <p>NO: This device is only available from the home system. Access to a volume mounted there is not possible from another system. Unit record devices are only generated with this POOL attribute.</p> <p>SH: (sharable) This device is usually generated for multiple systems and possesses a multiprocessor connection. It offers hardware attributes suitable for the parallel use of multiple systems. Disks are generated as shareable by default. Private disks with SYS-ALLOC=SHARE/ALL are therefore operated in SPD mode by default if they are allocated by means of the SET-DISK-PAR ASS-TIME=OPR command or a task-shareable user request.</p>	SH-DEV-STA SH-DEV-CONF
PRE-USE/ IN-USE	Specifies the number of devices of the type defined which have been reserved implicitly by volumes of the relevant phase: PREMOUNT, MOUNT, IN-USE	SH-DEV-STA (INF=SUM)
PREMOUNT-MSG	Specifies whether and how the premount message (NKVT012) for a tape volume is to be output.	SH-MOUNT

continued ➡

Keyword	Meaning	Used in command
RES-BY-MN	Specifies the number of devices of the type concerned which a user has reserved with the command SECURE-RESOURCE-ALLOCATION UNIT=mn.	SH-DEV-STA (INF=SUM)
RES-BY-TYPE	Specifies how many free devices of the type specified are needed to handle reservation and allocation requests already granted (e.g. /SEC-RES DEVICE= (TYPE=TAPE-C5,NUMBER=2)).	SH-DEV-STA (INF=SUM)
RESOURCES REQUESTED/ COLLECTED	List of devices or volumes specified with SEC-RES or list of devices and volumes already reserved by the collector task	SH-RES-REQ
RTC	Specifies the routing code of the depot (see LOCATION)	SH-DEV-DEPOT
SVL-ALLOC	Specifies the mode (system-shareable or system-exclusive) in which the disk is allocated (actual allocation); it does not have to conform to the presetting made by the operator by means of the command SET-DISK VOL=vsn,SYS=....	SH-DISK (INF=SYS)
SVL-RECORDING-MODE	<p>Defines the recording mode in which the disk was last used and whether the flag indicating a recorded inconsistency is set in the SVL. The possible values are:</p> <p>SRV: The disk is allocated in SRV mode (single recording by volume). Data is recorded on one disk.</p> <p>DRV: The disk is allocated in DRV mode (dual recording by volume); recording of data for a logical volume (visible at the user interface) generally takes place on two physical (mirror) disks.</p> <p>SRV (INCONS): The disk is allocated in SRV mode (single recording by volume) and the inconsistency flag is set in the SVL (possible, for example, during formatting or initialization; this flag remains set if formatting or initialization of the disk is prematurely terminated with VOLIN).</p> <p>DRV (INCONS): The disk is allocated in DRV mode (dual recording by volume) and the inconsistency flag is set in the SVL (e.g. indicating failure of one of the DRV disks or termination by means of a command).</p> <p>To remedy the inconsistent state: Reinitialize the disk or read in FDDRL backup copy.</p>	SH-DISK (INF=SYS)
SYSTEMS	System IDs of the systems occupying the disk. Allocation is stored on the disk's SVL.	SH-DISK (INF=SUM)

continued ➡

Keyword	Meaning	Used in command
SYS-ALLOC	<p>Value specifying in which mode a private disk is to be used by the home system in relation to other systems when USE=DMS applies.</p> <p>Possible modes:</p> <p>EXCL[USIVE]: Other systems are excluded from simultaneous use of this disk.</p> <p>SHARE[ABLE]: Other systems can access the disk simultaneously (SPD mode). Space and file usage are synchronized with the other systems via the SVL. Catalog locks are maintained on the disk's F1 label.</p> <p>ALL: The system allocation mode (system-exclusive or system-shareable) of a private disk is not determined until allocation (/SET-DISK-PAR SYS-ALLOC=... command).</p> <p>An "(A)" following the above indicates the generation attribute (ALL) of the device.</p>	SH-DISK (INF=PAR)
TAPE-MNEMONICS	Contains the location of the assigned tape devices.	SH-DEV-DEPOT
TAPE-MOUNT	<p>Indicates whether the operator is ready to perform tape mount operations.</p> <p>YES: Allocation requests for new tapes to be mounted lead to mount messages.</p> <p>NO: Allocation requests for new tapes to be mounted are automatically rejected by the system.</p>	SH-MOUNT
TAPE-SELECT	<p>Specifies how tapes are selected:</p> <p>BEST-GENERATED: Default. The first suitable free device is selected from the device table at system generation time.</p> <p>LEAST-RECENTLY-USED: From all the suitable free devices the one selected is the one which has been out of use the longest.</p> <p>BY-CONTROLLER: From all the suitable free devices the one selected is the one with the controller with the lightest load.</p>	SH-MOUNT
TASKS-WITH-RESERVATIONS	List of tasks with the number of devices of the specified type occupied/reserved by them.	SH-DEV-STA (INF=TASK/ ALL)

continued ➡

Keyword	Meaning	Used in command
TIME-STAMP	Specifies the exact date and time of day at which the SVL of the disk last registered an initial allocation (date/time of day of the first system ID stored in the SVL). This time stamp is used, in addition to the VSN, for disk identification.	SH-DISK (INF=SYS)
TIME-WEIGHT	Provides information on the wait time which was set by the START-RESOURCE-COLLECTION command and which is a factor in calculating the weighting by the system for the collector task.	SH-RES-REQ
TSK-PRIO	Priority of the relevant job.	SH-RES-REQ
TSK-TYPE	Informs the operator whether the task is a batch or interactive task or has been generated by RFA on the remote computer (SECURE requests were issued by another computer).	SH-RES-REQ
TSN	4-digit task sequence number assigned when a task is created.	SH-RES SH-DISK (INF=TASK)
TYPE	Specifies the device type of the volume from which information is requested. The device type can be influenced not only by a user request (CREATE-FILE, SECURE-RESOURCE-ALLOCATION, etc.) but also by the following events: online-event: The activation interrupt assigns the volume to a device whose device type determines the device type of the volume in the event of a VSN request. SET-DISK-PAR: If the device type is predefined with this command then it is possible to specify the type before any volume allocation. If the device type is not predefined, it is defined implicitly when the disk is allocated	SH-DISK (INF=PAR) SH-RES SH-DEV-STA
UN-CLASS	Device class to which the specified unit belongs. =DVC defines an end-user device (disk, tape, printer,...) =CTL defines a controller =CHN defines a channel =CPU defines a central processing unit	SH-DEV-CONF
UN-TYPE	Generic term for "device type". It covers not only the set of all possible device types, but also the values of all controller, channel and CPU types.	SH-DEV-CONF

continued ➡

Keyword	Meaning	Used in command
UNLOAD-RELEASED-TAPE	<p>Indicates whether tapes are unloaded following their release, provided they have not been unloaded by the user.</p> <p>ACCORDING-TO-USER-REQ: Default; tape and MTC devices are only unloaded on release if the user so requests.</p> <p>REGARDLESS-OF-USER-REQ (ALL): Tape and MTC devices are automatically unloaded on release, irrespective of any user request.</p> <p>REGARDLESS-OF-USER-REQ (MBK): MTC devices are automatically unloaded on release, irrespective of any user request. Tape devices are only unloaded if the user so requests.</p> <p>IGNORE-USER-REQ: For tape devices, a user request to unload is ignored. For MTC devices, a request to unload is ignored if the device is being operated in MANUAL mode, otherwise the device is unloaded at the request of the user.</p>	SH-MOUNT
USE	<p>Provides information on:</p> <ul style="list-style-type: none"> – the usage mode in which a mounted volume is to be operated; – the resultant degree of monitoring; – the scope of checking when assignment is performed by the monitors. <p>The following values are possible:</p> <p>DMS: The volume is occupied by one or more DMS applications. Only readable volumes are accepted for allocation, i.e.:</p> <ul style="list-style-type: none"> – disks can only be processed with an STD label; – tapes can be processed with or without an STD label as long as they are uniquely identifiable. <p>The standard task allocation mode for USE=DMS is task-shareable for private disks and task-exclusive for tapes. Each operator intervention during PHASE=IN-USE results in a REMOUNT-RECOVER and, in the case of tapes, in repositioning. It is ensured that only one volume with a particular VSN is allocated in the DMS usage mode.</p>	SH-DISK SH-TAPE

continued ➡

Keyword	Meaning	Used in command
USE (continued)	<p>SPECIAL: The volume is occupied by a special application (privileged application, e.g. VOLIN, INIT, test and debugging programs, FDDRL,...). The task and system allocation mode is EXCLUSIVE. Checks carried out upon allocation (VOLIN, INIT) or monitoring functions such as repositioning or MOVE (organized by online FDDRL itself) can be deactivated by the special application. There is no check to determine whether the VSN is unique.</p> <p>WORK: The tape mounted is used as a work tape (it is made available to the DMS user for the processing of work files).</p>	
USER-ALLOC[ATION]	Specifies which allocation requests issued by the user (task-shareable, task-exclusive) are allowed for a private disk working with USE=DMS. The suffix "(D)" indicates that the data was taken from the DISK-DEFAULTS.	SH-DISK (INF=PAR) SH-DISK-DEF
VM-ASSIGN	<p>Shows which device assignments or possible assignments exist to a VM:</p> <p>BY-GUEST The device is implicitly assigned to its own VM.</p> <p>BY-VM-ADMIN The device is explicitly assigned to its own VM.</p> <p>BY-GUEST-POSS The device is no assigned to its own VM, but implicit assignment is possible.</p> <p>In the following cases the device is not assigned to its own VM and implicit assignment is not possible:</p> <p>VM-INHIBITED The VM is not authorized for implicit assignment.</p> <p>DEV-INHIBITED The implicit assignment is not permitted for the device.</p> <p>ELSEWHERE The device is exclusively assigned to a different VM.</p>	SH-DEV-CONF (INF=VM2000)

continued ►

Keyword	Meaning	Used in command
VM-USAGE	<p>Shows which type of usage is being used for the device by VM2000. The meaning depends on VM-ASSIGN.</p> <p><i>If VM-ASSIGN = BY-GUEST / BY-VM-ADMIN:</i></p> <p>EXCL The device id explicitly assigned to its own VM.</p> <p>SH(D) The device is assigned to its own VM as shared with direct I/O processing (only a VM sharer).</p> <p>SH(I) The device is assigned to its own VM as shared with indirect I/O processing.</p> <p><i>If VM-ASSIGN = BY-GUEST-POSS:</i></p> <p>EXCL The device is explicitly assigned to a different VM, however, an assignment is possible due to the KEEP status of the device (MTC).</p> <p>SH(D) The device is assigned to its own VM as shared with direct I/O processing (only a VM sharer).</p> <p>SH(I) The device is assigned to a different VM as shared with indirect I/O processing.</p> <p>NONE The device is not assigned.</p> <p><i>If VM-ASSIGN = VM-INHIBITED / DEV-INHIBITED:</i></p> <p>EXCL: The device is exclusively assigned to a different VM.</p> <p>SH(D): The device is assigned to a different VM as shared with direct I/O processing (only a VM sharer).</p> <p>SH(I): The device is assigned to a different VM as shared with in direct I/O processing.</p> <p>NONE: The device is not assigned.</p> <p><i>If VM-ASSIGN = ELSEWHERE:</i></p> <p>EXCL: The device is exclusively assigned to a different VM.</p>	SH-DEV-CONF (INF=VM2000)

continued ➡

Keyword	Meaning	Used in command																								
VOL-A	<p>For public disks, this field merely indicates whether the mounted disk is the system disk SYSRES, a shareable disk, a paging disk or a “normal” public disk without any special attributes. For private volumes (exclusive disks), it provides information on the allocation of the volume by the user:</p> <p>PAGING: The disk is part of the allocated pubset and is used for paging.</p> <p>PUBLIC: The disk is part of the allocated pubset.</p> <p>SHARE: The disk is shareable and already occupied by one or more jobs. Requests from other users are permitted.</p> <p>CANCEL: Use of the disk was canceled.</p> <p>FREE: Currently no user is accessing the volume.</p> <p>EXCL: The private volume is exclusively allocated to a user job (other users cannot work with this volume).</p> <p>The values PAGING, PUBLIC and SHARE have the following meanings in connection with the values output for DEV-A:</p> <table border="1"> <thead> <tr> <th>DEV-A</th> <th>VOL-A</th> <th>Meaning:</th> </tr> </thead> <tbody> <tr> <td>PUBLIC</td> <td>PUBLIC</td> <td>The disk is IMCATED and is not used for paging</td> </tr> <tr> <td>PUBLIC</td> <td>PAGING</td> <td>The disk is IMCATED and is used for paging.</td> </tr> <tr> <td>PAGING</td> <td>PAGING</td> <td>The disk is used exclusively for paging.</td> </tr> <tr> <td>PUB-DRV</td> <td>PAGING</td> <td>The disk is IMCATED as a DRV volume and is used for paging.</td> </tr> <tr> <td>DRV-PAG</td> <td>PAGING</td> <td>One disk of the DRV pair is allocated for paging in DRV mode.</td> </tr> <tr> <td>DRV-PAG</td> <td>(empty)</td> <td>The other disk of the DRV pair is not used by paging.</td> </tr> <tr> <td>DMS-PAG</td> <td>SHARE</td> <td>The disk is used for paging and is also allocated by shareable tasks</td> </tr> </tbody> </table>	DEV-A	VOL-A	Meaning:	PUBLIC	PUBLIC	The disk is IMCATED and is not used for paging	PUBLIC	PAGING	The disk is IMCATED and is used for paging.	PAGING	PAGING	The disk is used exclusively for paging.	PUB-DRV	PAGING	The disk is IMCATED as a DRV volume and is used for paging.	DRV-PAG	PAGING	One disk of the DRV pair is allocated for paging in DRV mode.	DRV-PAG	(empty)	The other disk of the DRV pair is not used by paging.	DMS-PAG	SHARE	The disk is used for paging and is also allocated by shareable tasks	SH-RES SH-TAPE SH-DISK
DEV-A	VOL-A	Meaning:																								
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continued ➡

Keyword	Meaning	Used in command
VSN	<p>"Name" of a volume: the "VOLUME SERIAL NUMBER" of a volume (VOLIN, INIT) defined when a volume is initialized. If the volume does not have a readable label or if no VSN was included in the volume request, synonyms can also displayed.</p> <p>The following values are possible:</p> <p><vsn> : The VSN of a volume specified with VOLIN or INIT, see VOLUME operand of the CREATE-FILE, SECURE-RESOURCE-ALLOCATION commands.</p> <p>*UNKNO[WN]: The volume does not have a standard BS2000 label.</p> <p>*SCRAT[CH]: The volume request is not accompanied by a VSN (e.g. for tapes CREATE-FILE without a VOLUME operand or VOLUME=*NO/*ANY).</p> <p>*WORK: The tape concerned was requested with /CREATE-FILE with the SUPPORT=TAPE(DEVICE=WORK) operand.</p> <p>The following values are also possible with SH-RES, SH-DEV and SH-DISK:</p> <p>F-<mn>: What is known as a substitute VSN is displayed for foreign disks which have no BS2000 label. This is formed from the prefix "F" and the mnemonic device name <mn> of the foreign disk.</p>	SH-RES SH-DEV-STA SH-DISK SH-TAPE
VTOC-SYS	Catalog ID of the system which currently holds the VTOC lock for the disk and thus temporarily excludes other systems from space and catalog operations on this disk. The VTOC system is stored in the SVL of the disk.	SH-DISK (INF=SYS)
WAIT-TIME	Time the specified task has already waited for the release of the requested resources (hh:mm:ss).	SH-RES-REQ
#PHP	Displays the capacity of the disk in PAM pages (Number of Physical Half Pages).	SH-DISK (INF=SYS)

2.14 Time limits in BS2000

In BS2000 there are three different time limits which are of relevance to time-sharing users: These are specific to user IDs, tasks and program runs respectively.

A user-ID-specific time limit is defined by systems support in the user entry. At task termination the accounting system in BS2000 deducts the CPU time used from this time allotment.

For a task, the maximum CPU time (task time limit, TTL) can be specified at start time. The maximum CPU time that can be specified is the minimum possible from the time allotment in the user entry and from the maximum value from the job class definition. If no maximum CPU time is specified, the default value from the job class definition or, if applicable, the lower time allotment in the user entry is taken over as the maximum CPU time for the task. The TSOS user ID and users having the privilege No-Time-Limit in their user entry can start tasks without any time limit (NTL tasks). In a job class in whose job class definition, the default value for the maximum CPU time is not restricted (CPU-LIMIT is displayed with DEFAULT=NO-LIMIT and MAXIMUM=NO-LIMIT in the output from the SHOW-JOB-CLASS command), users can start tasks without any restriction on time even if there is no corresponding user entry.

Since the time allotment in the user entry is not updated until the task has terminated, the maximum CPU time (and possibly the CPU time actually used) for two or more tasks of one user ID may together exceed the time allotment.

When a program is loaded or started, a maximum program run time can be specified for the relevant program run (program time limit, PTL).

Interactive and batch jobs behave differently in respect of the maximum CPU time for the task (TTL) and the maximum program run time (PTL): The description below initially examines the normal case, i.e. the CPU time for an interactive job is not limited by the system parameter DIATTTL (= presetting DIATTTL=N):

TTL reached in batch job

The user can specify a task time limit (TTL) in the ENTER-JOB or ENTER-PROCEDURE command when starting a batch job. Once the batch job has used its maximum CPU time, message EXC0070 is displayed on the operator terminal (console). Systems support now has a maximum of 20 minutes in which to raise the batch job's TTL using the CHANGE-TASK-CPU-LIMIT command. This is a way of preventing important batch jobs being terminated prematurely because they have exceeded their TTL.

If the maximum CPU time for the batch job is not increased within the wait time of 20 minutes, the batch job is terminated. A distinction must be drawn between two cases:

1. If the TTL is reached during processing of BS2000 commands, the task terminates with message CMD1011.
2. If the TTL is reached during a program run, message EXC0072 is output and, where applicable, an STXIT routine is executed, but this may use no more than 30 CPU seconds. After execution of the STXIT routine or when 30 CPU seconds have elapsed, the program terminates with message EXC0073. Then the task terminates.

PTL reached in a batch job

If the PTL is reached during a program run in a batch job, message EXC0072 is output and, where applicable, an STXIT routine defined for the purpose is executed, but this may use no more than 30 CPU seconds. After execution of the STXIT routine or when 30 CPU seconds have elapsed, the program terminates with message EXC0073 and spin-off is triggered. If an error handling mechanism has been defined, further processing starts at the next SET-JOB-SET or IF-BLOCK-ERROR command. If not, processing ends at the next EXIT-JOB or LOGOFF command.

PTL or TTL reached in an interactive job

The user can specify a time limit in the SET-LOGON-PARAMETERS command. The user can basically continue working if a time limit is exceeded. If the TTL is exceeded and no program is loaded, message EXC0067 is output and the user can continue working for 30 CPU seconds until this process is repeated. If a program is loaded and the TTL or PTL is exceeded, the following applies: In procedure mode, message EXC0068 is output and execution continues. The time limit is incremented by 100 CPU seconds, i.e. the process is then repeated. In interactive dialog, message EXC0075 is output. The user can specify whether he wishes to continue or terminate execution. If he continues execution, the process is repeated after 30 CPU seconds.

Behavior when the default of the system parameter DIATTL is modified

The DIATTL=Y and DIATTL=Q settings enable systems support to limit the CPU time for an interactive task. These settings cause the following changes to the behavior described above:

DIATTL=Y

The interactive task is terminated when Task-Time-Runout is reached.

If the TTL is exceeded, first the message EXC0076 is issued. If a program run STXIT for timeout exists, this STXIT routine will be started after the time specified with the message has elapsed. By default the STXIT routine is granted another 30 CPU seconds.

DIATTL=Q (quick and quiet)

As with DIATTL=Y, the interactive job is terminated when Task-Time-Runout is reached.

Furthermore, both for an interactive job and for a batch job the additional times or wait times which otherwise apply for TTL and PTL are shortened to one second ("quick"). In addition, in the case of a batch job message EXC0070 is suppressed on the console ("quiet").

2.15 Overview of test privileges

The test privileges control the executability of software and hardware diagnostic activities in BS2000. The main user is the debugger AID.

The test privileges are split into read and write privileges. A user's write privilege may not be greater than his/her read privilege. Read and write privileges are defined hierarchically from 1 (low) to 9 (high):

A privilege with the value n implicitly covers the access permissions on the lower privilege levels 1 to $n-1$.

Systems support defines the maximum test privileges for a user ID using the ADD-USER or MODIFY-USER ATTRIBUTES command. System-wide maximum values for the read and write privileges can be defined using the system parameters RDTESTPR and WRTESTPR. These are set for a specific task using the MODIFY-TEST-OPTIONS command.

Test privileges with AID

If data is loaded (dynamically) from a read-protected file and if the read password was not specified, an "execute only" situation exists. Testing with AID is not possible in an "execute-only" situation, regardless of the test privileges set.

Read test privileges for AID read accesses

Value	Characteristics
1	<ul style="list-style-type: none"> – Access to the pages in the user's own user address space¹ and in the system address space² which are readable with the access rights of the normal user and are not secret pages³ – Access to the user PCBs of the user's own task
2	<ul style="list-style-type: none"> – Additional access to the TCB of the user's own task
3	<ul style="list-style-type: none"> – Additional access to the secret pages in the user's own user address space which are readable with the access rights of the normal user
4	<ul style="list-style-type: none"> – Not assigned
5	<ul style="list-style-type: none"> – Not assigned
6	<ul style="list-style-type: none"> – Additional access to the pages in the user's own user address space which are only readable with the access rights of the operating system and are not secret pages – Additional access to the system PCBs of the user's own task and to the XVT
7	<ul style="list-style-type: none"> – Not assigned
8	<ul style="list-style-type: none"> – Additional access to all pages in the system address space, all secret pages and all pages of other tasks – Additional access to the user PCBs, system PCBs and TCBs of other tasks
9	<ul style="list-style-type: none"> – Not assigned

Table 11: Read test privileges for AID read accesses

¹ Program space and data spaces of the user

² System space and data spaces of the system

³ Pages protected against diagnostic accesses

Write test privileges for AID write accesses

Value	Characteristics
1	<ul style="list-style-type: none"> – Access to the pages in the user's own user address space¹ which can be written using the access rights of the normal user and are not secret pages² – Additional access to the user's local task pages in the user's own program space which are "only readable"³ with the access rights of the normal user and are not secret pages or "trusted UTM"⁴ pages – Access to the user PCBs of the user's own task
2	– Not assigned
3	<ul style="list-style-type: none"> – Additional access to the secret pages in the user's own user address space which can be written using the access rights of the normal user – Additional access to the user's local task secret pages in the user's own program space which are "only readable" with the access rights of the normal user and are not "trusted UTM" pages
4	– Not assigned
5	– Not assigned
6	– Additional access to the pages in the user's own user address space which can be written using the access rights of the operating system and are not secret pages
7	– Not assigned
8	<ul style="list-style-type: none"> – Additional access to all pages in the system address space⁵, all secret pages and all pages of other tasks – Additional access to the XVT and to the user PCBs, system PCBs and TCBs of all tasks
9	– Not assigned

Table 12: Write test privileges for AID write accesses

¹ Program space and data spaces of the user

² Pages protected against diagnostic accesses

³ The page attribute "only readable" is ignored by AID in this case

⁴ Pages of user jobs which run with the system privilege SECURE-OLTP

⁵ System space and data spaces of the system

Note on OWN-UID-DEBUGGING

The "static AID test with low test privilege" can be permitted for other tasks which run under the user's own user ID by means of the OWN-UID-DEBUGGING operand in the MODIFY-TEST-OPTIONS command. If this is the case, the same privileges as for accessing your own user address space are sufficient for the read accesses to this task's user address space.

A write privilege of at least 2 is required for write accesses to this task's user address space. In addition, the same test privileges apply as for write accesses to the user address space of the user's own task. In the case of write accesses to these tasks' memory pool pages, write privilege 8 is always required.

Test privileges for the other software diagnostic products

Read test privileges

Value	Product	Characteristics
3	CDUMP	– System dump may be taken under a normal user ID
8	ANITA	– Active system may be diagnosed with DAMP and other user programs which use ANITA

Test privileges for online maintenance of the hardware

Read test privileges (= protection levels)

Value	Characteristics
1 - 3	– Safe with regard to data protection and data security. Only the user's own data patterns are used.
4	– The program can read data from the customer area.
5	– Not used
6	– The program can overwrite data from the customer area.
7 - 8	– Not used
9	– This protection level cancels the monitoring (in the WARTOPT system module) of the inputs/outputs to ensure they are not harmful to the system. Security is not guaranteed for customer data.

2.16 Working with S variables

In conjunction with the chargeable product SDF-P,¹ the output of certain SHOW commands can be passed to structured S variables.

2.16.1 General notes on command output

The output of SHOW commands can be sent to the system files SYSOUT and/or SYSLST and, in the case of commands which support this, also in S variables. SYSOUT and SYSLST output consists of constant labels and items of variable information. In order for current parts of the full set of information to be further processed in procedures, the output must be redirected to a file. Then the individual items can be selected by string processing. This calls for precise understanding of the output layout. As SYSOUT and SYSLST output is subject to change from version to version, user-defined procedures need to be continually updated to match. With structured output in S variables, each item of information can be stored as the contents of an S variable. The names of the S variables allow the user to access the required individual item of information in the SHOW command, regardless of the output layout. The names of the S variables are preset for each SHOW command and are guaranteed for subsequent versions; in other words, they are not subject to change.

2.16.2 Command output in S variables

2.16.2.1 S variable stream mechanism (SYSINF, SYSMMSG and SYSVAR)

SDF-P supports a mechanism known as “streams for structured variables” (henceforth referred to as S variable streams). S variable streams are an alternative or a supplement to output in system files. SDF-P is responsible for controlling the S variable streams. By default, the operating system supplies three S variable streams: SYSINF, SYSMMSG and SYSVAR. If necessary, users can also declare and name their own S variable streams.

The SYSINF, SYSMMSG and SYSVAR S variable streams

SYSINF: Structured output from commands and programs is passed to the assigned S variables.

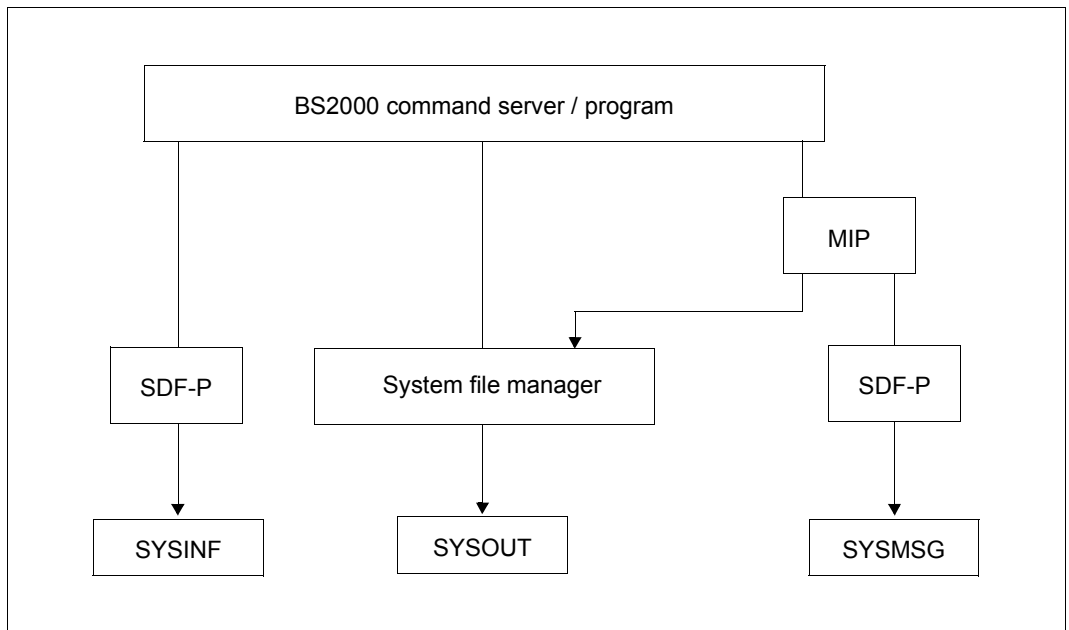
SYSMMSG: Guaranteed messages are passed to the assigned S variables in structured output format.

¹ Without SDF-P this functionality is only available with SDF-P-BASYS in compiled S procedures.

SYSVAR: Both structured command and program output and guaranteed messages are passed to the assigned S variables. SYSVAR subsumes SYSINF and SYSMMSG.

For further information on S variable streams refer to the “SDF-P” manual [34].

The following diagram illustrates both output to SYSOUT by the system file manager and redirection of output information to the SYSINF and SYSMMSG S variable streams under the control of SDF-P.



Command and program output to the SYSINF and SYSMMSG S variable streams or to SYSOUT

SYSINF

Working with S variables generated in the structured output of specific SHOW commands is discussed in detail in [section “Declaring S variables” on page 1-113](#) and the following subsections, starting on .

SYSMMSG

The format and contents of the S variables generated for guaranteed messages by the system component MIP are briefly discussed here. For further information on the subject refer to the “Introduction to System Administration” manual [14].

SDF-P is responsible for controlling the SYSMMSG S variable stream, which serves to redirect guaranteed messages to S variables. In guaranteed messages, the message ID and the numbering and meaning of the inserts are constant message components.

The following actions are required in order for guaranteed messages to be output in a structured S variable:

1. The user must declare a list variable of type STRUCTURE.

```
/DECLARE-VARIABLE VAR-NAME=<var-name>(TYP=*STRUCTURE),
MULTIPLE-ELEMENT=*LIST
```

2. The user must assign the SYSMMSG S variable stream for structured output in S variables. One of the following declarations is required:

On command level:

- a) Using the EXECUTE-CMD command: structured output in S variables is declared for one command.

```
/EXEC-CMD (<cmd-name>),MSG-STRUCTURE-OUTPUT=<var-name>
```

- b) Using the ASSIGN-STREAM command: the assignment of the S variable stream remains valid for all subsequent commands until it is explicitly canceled (ASSIGN-STREAM SYSMMSG,TO=*STD).

```
/ASSIGN-STREAM STREAM-NAME=SYSMMSG,TO=*VARIABLE(<var-name>)
```

On program level:

The CMD macro declares structured output in S variables for a number of commands.

```
CMD '<cmd-name>',...,VER=4,MSGVAR@=<add>,MSGVARL=<length>,[,MSGEXT=YES]
```

<add> is the symbolic address of the location containing the name of the S variable. For details of the CMD macro refer to the “Executive Macros” manual [22].

3. The message output destination must be defined in the MSG7X macro. If DESTINATION=SYSOUT is specified, guaranteed messages will always be output in S variables, provided that the user has declared an S variable. In addition, the BUFFER operand can be assigned a user-specific storage area, and BUFFUSE=EXTERNAL can be assigned. On the MSG7X macro refer to the “Executive Macros” manual [22].

- Using the MSGMAKER utility, the message must be identified as guaranteed (also refer to the “Utility Routines” manual [9]). MIP generates the following S variables for guaranteed messages:

MSG-ID: contains the message ID.

REPLY: contains the reply to the message if it expects an answer from the user.

I0 through I14: default insert names; I0 through I14 are the defaults used by MIP as names for S variables. If the user defines names for inserts with the MSGMAKER utility, these names (in uppercase) are used as S variable names.

MSG-TEXT: contains the message text inclusive of all replaced inserts.

Note

The S variables that MIP generates are of the data type STRING.

The completed S variable that MIP outputs is composed of the S variable name declared by the user and the S variable name generated by MIP. These two subnames, separated by a dot, form the actual name of the S variable. Each S variable that exists for a guaranteed message is associated with an element of a list. Each additional guaranteed message is incorporated as a new list element.

2.16.2.2 Declaring S variables

Before an S variable stream is assigned to an S variable, it must be declared. This is done by using the `DECLARE-VARIABLE` command to declare a compound S variable of type `STRUCTURE`, with the structure being defined as an element of a list. The name of this S variable is freely selectable within the terms of the SDF-P naming conventions. The defined structure should be dynamically extensible (`DEFINITION=*DYNAMIC` is the default setting).

```
/DECLARE-VARIABLE VAR-NAME=OUT(TYPE=*STRUCTURE),MULTIPLE-ELEMENTS=*LIST
```

Note

The S variable name declared here is `OUT`. This is also the name used in the tables listing the S variables for each `SHOW` command.

For further information on the `DECLARE-VARIABLE` command refer to the “SDF-P” manual [34].

2.16.2.3 Assigning S variable streams

The `ASSIGN-STREAM` or `EXECUTE-CMD` commands allow to specify that you require structured output in an S variable.

For further information on these commands refer to the “SDF-P” manual [34].

ASSIGN-STREAM

You use `ASSIGN-STREAM` to request structured output to an S variable for all subsequent commands. As long as this assignment remains in force, the S variable will be added to accordingly for each `SHOW` command that is issued which supports structured output in S variables.

Example

The S variable `OUT` is declared as described above. The `SHOW-STREAM-ASSIGNMENT` command is then used to display the current assignments of the `SYSINF`, `SYSMSG` and `SYSVAR` S variable streams. `SYSINF` and `SYSMSG` are by default assigned to `SYSVAR`; the assignment of `SYSVAR` is `*DUMMY`, which means that neither command output nor guaranteed messages are assigned to an S variable stream.

```
/SHOW-STREAM-ASSIGNMENT
```

Output to SYSOUT

```
STREAM-NAME   = SYSINF  
  ASSIGN-LEVEL = 0  
  DESTINATION  = SYSVAR  
STREAM-NAME   = SYSMSG  
  ASSIGN-LEVEL = 0  
  DESTINATION  = SYSVAR  
STREAM-NAME   = SYSVAR  
  ASSIGN-LEVEL = 0  
  DESTINATION  = *DUMMY
```

The `ASSIGN-STREAM` command specifies that structured command output is to be routed via the `SYSINF` S variable stream and written to S variable `OUT`.

```
/ASSIGN-STREAM STREAM-NAME=SYSINF ,TO=*VAR(VAR-NAME=OUT)
```

The `SHOW-STREAM-ASSIGNMENT` command can now be used to display the current assignment of `SYSINF`. This command also supports structured output in S variables, so its output is already being written to the `VAR S` variable.

```
/SHOW-STREAM-ASSIGNMENT
```

Output to SYSOUT

```
STREAM-NAME   = SYSINF
ASSIGN-LEVEL  = 0
DESTINATION   = *VARIABLE
  VARIABLE-NAME = OUT
    VAR-MODE   = *EXTEND
  RETURN-VARIABLE-NAME = *NONE
  CONTROL-VAR-NAME = *NONE
  RET-CONTROL-VAR-NAME = *NONE
STREAM-NAME   = SYSMSG
ASSIGN-LEVEL  = 0
DESTINATION   = SYSVAR
STREAM-NAME   = SYSVAR
ASSIGN-LEVEL  = 0
DESTINATION   = *DUMMY
```

The `SHOW-FILE-ATTRIBUTES` command likewise supports structured output in S variables. The information on storage space usage is output separately for public and private volumes. The data is written to `OUT` as an additional list element.

```
/SHOW-FILE-ATTRIBUTES *ALL,INF=*SPACE-SUM
```

Output to SYSOUT

```

%:20SG: PUBLIC:      396 FILES RES=      9006 FRE=      1805 REL=      867 PAGES
%:20SG: PUB/S2:      50 FILES RES=     10872 FRE=     1936 REL=     1867 PAGES
```

The contents of OUT are displayed with the SHOW-VARIABLE command.

```

/show-var inf=*par(list-index-number=*yes)
OUT#1.STREAM-NAME = SYSINF ← structured output of SHOW-STREAM-ASSIGNMENT
OUT#1.ASS-LEV = 0
OUT#1.SERVER-NAME =
OUT#1.SERVER-INFO =
OUT#1.VAR-NAME = OUT
OUT#1.VAR-MODE = *EXT
OUT#1.RET-VAR-NAME = *NONE
OUT#1.RET-VAR-MODE =
OUT#1.CONTR-VAR-NAME = *NONE
OUT#1.CONTR-VAR-MODE =
OUT#1.RET-CONTR-VAR-NAME = *NONE
OUT#1.RET-CONTR-VAR-MODE =
OUT#1.DEST = *VAR
OUT#2.STREAM-NAME = SYSMSG
OUT#2.ASS-LEV = 0
OUT#2.SERVER-NAME =
OUT#2.SERVER-INFO =
OUT#2.VAR-NAME =
OUT#2.VAR-MODE =
OUT#2.RET-VAR-NAME =
OUT#2.RET-VAR-MODE =
OUT#2.CONTR-VAR-NAME =
OUT#2.CONTR-VAR-MODE =
OUT#2.RET-CONTR-VAR-NAME =
OUT#2.RET-CONTR-VAR-MODE =
OUT#2.DEST = SYSVAR
OUT#3.STREAM-NAME = SYSVAR
OUT#3.ASS-LEV = 0
OUT#3.SERVER-NAME =
OUT#3.SERVER-INFO =
OUT#3.VAR-NAME =
OUT#3.VAR-MODE =
OUT#3.RET-VAR-NAME =
OUT#3.RET-VAR-MODE =
OUT#3.CONTR-VAR-NAME =
OUT#3.CONTR-VAR-MODE =
OUT#3.RET-CONTR-VAR-NAME =
OUT#3.RET-CONTR-VAR-MODE =
OUT#3.DEST = *DUMMY
OUT#4.PUBSET-ID = 20SG ← structured output of SHOW-FILE-ATTRIBUTES
OUT#4.PUBSET.NUM-OF-F = 396
OUT#4.PUBSET.REL = 867
OUT#4.PUBSET.RESERVED = 9006
OUT#4.PUBSET.FREE = 1805
OUT#4.MIGRATE-S1.NUM-OF-F = 0
OUT#4.MIGRATE-S1.REL = 0
OUT#4.MIGRATE-S1.RESERVED = 0
OUT#4.MIGRATE-S1.FREE = 0
OUT#4.MIGRATE-S2.NUM-OF-F = 50
OUT#4.MIGRATE-S2.REL = 1867
OUT#4.MIGRATE-S2.RESERVED = 10872
OUT#4.MIGRATE-S2.FREE = 1936
OUT#4.PRIV.NUM-OF-F = 0
OUT#4.PRIV.REL = 0
OUT#4.PRIV.RESERVED = 0
OUT#4.PRIV.FREE = 0
OUT#4.TAPE.NUM-OF-F = 0

```

Next the command ASSIGN-STREAM SYSINF, TO=*STD is used to re-assign the S variable stream to its default setting. This terminates structured output to S variable OUT.

EXECUTE-CMD

To restrict structured output to a single command you use the `EXECUTE-CMD` command to invoke a `SHOW` command, specifying that the structured output is to be passed to the S variable `OUT` that you have already declared (see [section “Declaring S variables” on page 1-113](#)).

```
/EXECUTE-CMD CMD=(SHOW-USER-ATTR INF=*ATTR), STRUCTURE-OUTPUT=OUT,
TEXT-OUTPUT=*NONE
```

`TEXT-OUTPUT=*NONE` suppresses output to `SYSOUT`.

2.16.2.4 S variable format

A structure is defined for an object (such as a file: `SHOW-FILE-ATTRIBUTES FILE-NAME=name`) specified in the `SHOW` command. If a number of objects are specified (using a wildcard, for example: `SHOW-FILE-ATTRIBUTES FILE-NAME=name*`), or if a number of command outputs are written to a single S variable (see `ASSIGN-STREAM`, [page 1-114](#)), a list of structures is created. For each item of information relating to the object (e.g. catalog ID, file size), an S variable is defined as an element of the structure and assigned the information item as its contents.

Example 1

```
/declare-var var-name=var(type=*structure),multiple-elements=*list
/execute-cmd cmd=(show-file-attr file-name=job*,inf=*name-and-space),
text-output=*none,structure-output=out
/show-var inf=*par(list-index-number=*yes)
OUT#1.F-NAME = :20SG:$USER1.JOBA
OUT#1.CAT-ID = 20SG
OUT#1.USER-ID = USER1
OUT#1.SHORT-F-NAME = JOBA
OUT#1.F-SIZE = 3
OUT#2.F-NAME = :20SG:$USER1.JOBB
OUT#2.CAT-ID = 20SG
OUT#2.USER-ID = QM211
OUT#2.SHORT-F-NAME = JOBB
OUT#2.F-SIZE = 3
OUT#3.F-NAME = :20SG:$USER1.JOBC
OUT#3.CAT-ID = 20SG
OUT#3.USER-ID = USER1
OUT#3.SHORT-F-NAME = JOBC
OUT#3.F-SIZE = 3
```

Key to Example 1

The user-defined S variable `OUT` contains the entire output. The string `(#i)` indicates that `OUT` is a list variable that may contain many elements. In this example there are three elements ($i = 1$ to 3). A structure composed of various separate items of information is generated for each object selected by `FILE-NAME=JOB*`. Each item is stored in a separate S variable, such that the S variable `OUT(#i).CAT-ID`, for example, contains the catalog ID.

Example 2

```

/execute-cmd cmd=(show-file-attr file-name=job*,inf=*par(alloc=*yes)),
text-output=*none,structure-output=out
/show-var var,inf=*par(list-index-number=*yes)
OUT#1.F-NAME = :20SG:$QM211.JOBA
OUT#1.CAT-ID = 20SG
OUT#1.USER-ID = QM211
OUT#1.SHORT-F-NAME = JOBA
OUT#1.F-SIZE = 3
OUT#1.SUP = *PUB
OUT#1.HIGHEST-USED-PAGES = 1
OUT#1.SEC-ALLOC = 24
OUT#1.BLOCK-COUNT = 0
OUT#1.EXT#1.VOL = GVS2.2
OUT#1.EXT#1.DEV = D3435
OUT#1.EXT#1.NUM-OF-EXT = 1
OUT#1.NUM-OF-EXT = 1
OUT#2.F-NAME = :20SG:$QM211.JOBB
OUT#2.CAT-ID = 20SG
OUT#2.USER-ID = QM211
OUT#2.SHORT-F-NAME = JOBB
OUT#2.F-SIZE = 3
OUT#2.SUP = *PUB
OUT#2.HIGHEST-USED-PAGES = 1
OUT#2.SEC-ALLOC = 24
OUT#2.BLOCK-COUNT = 0
OUT#2.EXT#1.VOL = GVS2.3
OUT#2.EXT#1.DEV = D3435
OUT#2.EXT#1.NUM-OF-EXT = 1
OUT#2.NUM-OF-EXT = 1
OUT#3.F-NAME = :20SG:$QM211.JOBC
OUT#3.CAT-ID = 20SG
OUT#3.USER-ID = QM211
OUT#3.SHORT-F-NAME = JOBC
OUT#3.F-SIZE = 3
OUT#3.SUP = *PUB
OUT#3.HIGHEST-USED-PAGES = 1
OUT#3.SEC-ALLOC = 24
OUT#3.BLOCK-COUNT = 0
OUT#3.EXT#1.VOL = GVS2.0
OUT#3.EXT#1.DEV = D3435
OUT#3.EXT#1.NUM-OF-EXT = 1
OUT#3.NUM-OF-EXT = 1

```

Key to Example 2

The user-defined list variable `OUT` from Example 1 again holds three elements in Example 2. The argument `INF=*PAR(ALLOC=*YES)` causes all file attributes relating to space allocation to be output for the selected files. The attributes `F-NAME`, `CAT-ID`, `USER-ID`, . . . , `EXT` form the elements of the structure. The `EXT` element is in turn a list composed of the elements `VOL`, `DEV` and `NUM-OF-EXT`.

If information for an object can be further subdivided hierarchically (see the `EXT` element), a compound S variable is defined as an element of the higher-ranking structure for each hierarchy. A hierarchically lower-ranking S variable may be a simple S variable (see `VOL`, `DEV`, `NUM-OF-EXT`), a structure or a list of simple S variables and/or structures.

S variable name components

The names of the list elements (e.g. F-NAME, F-SIZE) are preset for each SHOW command. They are appended to the S variable name declared by the user. The names match the corresponding operand names as closely as possible. If the information on this level is further subdivided hierarchically, further names are appended, preceded by a dot as separator.

S variable contents

The contents of S variables match the corresponding operand values as closely as possible. The data type of the S variable governs the range of characters of which the contents are composed.

S variable data types

S variables have a fixed data type: String, Integer or Boolean.

2.16.2.5 Accessing S variables

The string (*LIST) appears only if you output the S variable with the SHOW-VARIABLE command (if the element number #i is displayed instead of (*LIST), the LIST-INDEX-NUMBER=*YES operand must be specified). Access to specific items of information is achieved with the string #i, where i is the i-th element of the list.

Example 3

```

/show-var var#3.sec-alloc _____ (1)
VAR(*LIST).SEC-ALLOC = 24
/show-var var#3.ext#1.vol _____ (2)
OUT#3.EXT#1.VOL = GVS2.0
/show-var var#3.ext#.vol _____ (3)
OUT#3.EXT#1.VOL = GVS2.0

```

Key to Example 3

Example 3 is based on the structured output of Example 2.

- (1) var#3.sec-alloc directly accesses the “Secondary Allocation” item which is an attribute of file JOBC. The attributes of JOBC form the third element in the output list.
- (2) var#3.ext#1.vol causes the first element of list variable EXT to be output.
- (3) Has the same effect as (2). To refer to the first list element it is sufficient to specify var#3.ext#.vol.

2.16.2.6 Re-using S variables

Example 4

```
/write-text 'There are &(var#3.F-SIZE) PAM pages reserved for  
file &(var#3.SHORT-F-NAME)'  
There are 3 PAM pages reserved for file JOBC
```

Example 4 is based on the structured output of Example 2.

The contents of S variables `var#3.SHORT-F-NAME` and `var#3.F-SIZE` can be re-used by means of expression substitution.

Example 5

The contents of S variable `FILES` are to be re-used in S procedure `proc.s-var`.

S procedure proc.s-var

```

/DECL-VAR FILES(TYPE=*STRUCTURE),MULTIPLE-ELEM=*LIST _____ (1)
/DECL-VAR INCR(TYPE=*STRUCTURE) _____ (2)
/DECL-VAR FILES-OLD,MULTIPLE-ELEM=*LIST _____ (3)
/
/WRITE-TEXT '*****'
/WRITE-TEXT '** This procedure lists all files which have **'
/WRITE-TEXT '** not been modified for over 365 days **'
/WRITE-TEXT '*****'
/
/EXEC-CMD (SHOW-FILE-ATTR *ALL,INF=*PAR(HIST=*YES),-
/          SELECT=*BY-ATTR(LAST-ACCESS-DATE=*INTERVAL(TO=-365)),-
/          STRUCTURE-OUTPUT=FILES,TEXT-OUTPUT=*NONE _____ (4)
/
/WRITE-TEXT 'The following files have not been modified in the last 365 days:'
/FOR INCR=*LIST(FILES)
/  WRITE-TEXT 'FILE: &(INCR.SHORT-F-NAME)' _____ (5)
/  MODIFY-FILE-ATTRIBUTES FILE-NAME=&(INCR.SHORT-F-NAME),-
/    NEW-NAME=&('OLD.'//INCR.SHORT-F-NAME) _____ (6)
/  IF-CMD-ERROR _____ (7)
/    WRITE-TEXT 'Error renaming file: -
/      &(INCR.SHORT-F-NAME)'
/  END-IF
/  ELSE
/    SET-VAR FILES-OLD='&('OLD.'//INCR.SHORT-F-NAME)',WRITE-MODE=*EXTEND _____ (8)
/  END-IF
/END-FOR
/WRITE-TEXT 'List of all files with the prefix OLD'
/SHOW-VAR FILES-OLD,INF=*PAR(LIST-INDEX-NUMBER=*YES) _____ (9)

```

- (1) S variable `FILES` is declared as a structured list variable.
- (2) An incrementing variable is declared for the subsequent FOR loop; this must also be of type `STRUCTURE`.
- (3) `FILES-OLD` is declared as a list variable. Here all the file names starting with the prefix “OLD” will be stored.
- (4) The `EXECUTE-CMD` command causes the output of `SHOW-FILE-ATTRIBUTES INF=*PAR(HIST=*YES)` to be stored in the `FILES` S variable. Output to `SYSOUT` is suppressed by `TEXT-OUTPUT=*NONE`. The `SELECT` operand selects all files last modified over 365 days ago.
- (5) Each file that has not been modified for over 365 days is listed under its file name as stored in the `INCR.SHORT-F-NAME` S variable.
- (6) The `MODIFY-FILE-ATTRIBUTES` command adds the prefix “OLD.” to the names of the selected files.
- (7) If an error occurs while `MODIFY-FILE-ATTRIBUTES` is executing, it is handled by the `IF-CMD-ERROR` block.

- (8) The `SET-VARIABLE` command assigns the new file name with the prefix “OLD.” to the `FILES-OLD` S variable. The `MODE=*EXTEND` argument causes `FILES-OLD` to be extended by one list element each time the rename loop iterates.
- (9) The contents of `FILES-OLD` are output by the `SHOW-VAR` command.

Execution log

```
/call-proc proc.s-var
*****
** This procedure lists all files which have      **
** not been modified for over 365 days          **
*****
The following files have not been modified in the last 365 days:
FILE: ISAM
FILE: MESSAGEMAKER
FILE: MSE1
FILE: MSE2
FILE: MSG.OUTPUT
FILE: MSG.PROC
FILE: README.RZ
FILE: README.RZ.ISAM
FILE: README.RZ.OLD
FILE: VAR.PROC
List of all files with the prefix OLD
FILES-OLD#1 = OLD.ISAM
FILES-OLD#2 = OLD.MESSAGEMAKER
FILES-OLD#3 = OLD.MSE1
FILES-OLD#4 = OLD.MSE2
FILES-OLD#5 = OLD.MSG.OUTPUT
FILES-OLD#6 = OLD.MSG.PROC
FILES-OLD#7 = OLD.README.RZ
FILES-OLD#8 = OLD.README.RZ.ISAM
FILES-OLD#9 = OLD.README.RZ.OLD
FILES-OLD#10 = OLD.VAR.PROC
```

Example 6

Example 6 builds on the S procedure described in Example 5. If you want to restore the original file names of all files with the prefix “OLD.”, you can do so interactively using the following commands:

```
/decl-var restore(type=struc),mult-elem=*list
/exec-cmd (show-file-attr old.*,inf=*all),struc-output=restore,text-output=*none
/decl-var y(type=struc)
/for y=*list(restore)
%FOR/mod-fi-attr &(y.SHORT-F-NAME),&(substring(y.SHORT-F-NAME,5))
%FOR/end-for
```

2.16.3 Command overview

The table below lists all the SHOW commands for which the S variables are described in this manual. For detailed command descriptions refer to the product manuals listed in the right-hand column.

Command	Manual in which it is described
SHOW-ACCOUNTING-STATUS	„Commands, Vol. 5“ [1]
SHOW-ACS-OPTIONS	„Commands, Vol. 5“ [1]
SHOW-ACS-SYSTEM-FILES	„Commands, Vol. 5“ [1]
SHOW-ACTIVE-SPOOL-DEVICES	„Commands, Vol. 5“ [1], „SPOOL“ [42]
SHOW-ALIAS-CATALOG-ENTRY	„Commands, Vol. 5“ [1]
SHOW-BLOCK-TO-FILE-ASSIGNMENT	„Commands, Vol. 5“ [1]
SHOW-CACHE-CONFIGURATION	„Commands, Vol. 5“ [1]
SHOW-CALENDAR	„Commands, Vol. 5“ [1]
SHOW-CCOPY-SESSION	„Commands, Vol. 5“ [1]
SHOW-CE-LOCK	„Commands, Vol. 5“ [1]
SHOW-CJC-STATUS	„Commands, Vol. 5“ [1], „JV“ [20]
SHOW-CONSLOG-ATTRIBUTES	„Commands, Vol. 5“ [1]
SHOW-CONSOLE-FILTER	„Commands, Vol. 5“ [1]
SHOW-CONSOLE-STATUS	„Commands, Vol. 5“ [1]
SHOW-DEVICE-CONFIGURATION	„Commands, Vol. 5“ [1]
SHOW-DEVICE-DEPOT	„Commands, Vol. 5“ [1]
SHOW-DEVICE-STATUS	„Commands, Vol. 5“ [1]
SHOW-DISK-DEFAULTS	„Commands, Vol. 5“ [1]
SHOW-DISK-STATUS	„Commands, Vol. 5“ [1]
SHOW-FILE-ATTRIBUTES	„Commands, Vol. 6“ [1]
SHOW-FILE-LINK	„Commands, Vol. 6“ [1]
SHOW-FILE-LOCKS	„Commands, Vol. 6“ [1]
SHOW-FILE-NAME-PREFIX	„Commands, Vol. 6“ [1]
SHOW-GCF-CATALOGS	„Commands, Vol. 6“ [1]
SHOW-GCF-OBJECT-TYPES	„Commands, Vol. 6“ [1]
SHOW-GCF-SERVER-TASKS	„Commands, Vol. 6“ [1]
SHOW-GS-STATUS	„Commands, Vol. 6“ [1]
SHOW-GS-VOLUME-ATTRIBUTES	„Commands, Vol. 6“ [1]

Command	Manual in which it is described
SHOW-HEL-CHECK	„Commands, Vol. 6“ [1]
SHOW-HEL-LOGGING	„Commands, Vol. 6“ [1]
SHOW-INDEX-ATTRIBUTES	„Commands, Vol. 6“ [1]
SHOW-INSTALLATION-PATH	„Commands, Vol. 6“ [1] , „IMON“ [19]
SHOW-ISAM-POOL-ATTRIBUTES	„Commands, Vol. 6“ [1]
SHOW-ISAM-POOL-LINK	„Commands, Vol. 6“ [1]
SHOW-JOB-CLASS	„Commands, Vol. 6“ [1]
SHOW-JOB-OPTIONS	„Commands, Vol. 6“ [1]
SHOW-JOB-STATUS	„Commands, Vol. 6“ [1]
SHOW-JOB-STREAM	„Commands, Vol. 6“ [1]
SHOW-JV-ATTRIBUTES	„Commands, Vol. 6“ [1], „JV“ [20]
SHOW-JV-LINK	„Commands, Vol. 6“ [1], „JV“ [20]
SHOW-MASTER-CATALOG-ENTRY	„Commands, Vol. 6“ [1]
SHOW-MIP-PARAMETERS	„Commands, Vol. 6“ [1]
SHOW-MOUNT-PARAMETER	„Commands, Vol. 6“ [1]
SHOW-MSG-FILE-ASSIGNMENT	„Commands, Vol. 6“ [1]
SHOW-MSG-OPTIONS	„Commands, Vol. 6“ [1]
SHOW-MSG-SUBSCRIPTION	„Commands, Vol. 6“ [1]
SHOW-MSG-SUPPRESSION	„Commands, Vol. 6“ [1]
SHOW-NET-STORAGE	„Commands, Vol. 6“ [1]
SHOW-NET-STORAGE-OCCUPATION	„Commands, Vol. 6“ [1]
SHOW-OPERATOR-ATTRIBUTES	„Commands, Vol. 6“ [1]
SHOW-OPERATOR-ROLE	„Commands, Vol. 6“ [1]
SHOW-PENDING-MSG	„Commands, Vol. 6“ [1]
SHOW-POSIX-USER-ATTRIBUTES	„Commands, Vol. 6“ [1], „POSIX Commands“ [28]
SHOW-POSIX-USER-DEFAULTS	„Commands, Vol. 6“ [1], „POSIX Commands“ [28]
SHOW-PRINT-JOB-ATTRIBUTES	„Commands, Vol. 6“ [1], „SPOOL“ [42]
SHOW-PRINT-JOB-STATUS	„Commands, Vol. 6“ [1], „SPOOL“ [42]
SHOW-PRINTER-POOLS	„Commands, Vol. 6“ [1], „SPOOL“ [42]
SHOW-PUBSET-ATTRIBUTES	„Commands, Vol. 6“ [1]
SHOW-PUBSET-CACHE-ATTRIBUTES	„Commands, Vol. 6“ [1]
SHOW-PUBSET-CATALOG-ALLOCATION	„Commands, Vol. 6“ [1]

Command	Manual in which it is described
SHOW-PUBSET-CONFIGURATION	„Commands, Vol. 6“ [1]
SHOW-PUBSET-DEFINITION-FILE	„Commands, Vol. 6“ [1]
SHOW-PUBSET-FILE-SERVICES	„Commands, Vol. 6“ [1]
SHOW-PUBSET-IMPORT-EXPORT	„Commands, Vol. 6“ [1]
SHOW-PUBSET-NET-STORAGE	„Commands, Vol. 6“ [1]
SHOW-PUBSET-OCCUPATION	„Commands, Vol. 6“ [1]
SHOW-PUBSET-PARAMETERS	„Commands, Vol. 6“ [1]
SHOW-PUBSET-PROCESSING	„Commands, Vol. 6“ [1]
SHOW-PUBSET-RESTRICTION	„Commands, Vol. 6“ [1]
SHOW-PUBSET-SPACE-ALLOCATION	„Commands, Vol. 6“ [1]
SHOW-PUBSET-SPACE-DEFAULTS	„Commands, Vol. 6“ [1]
SHOW-RESOURCE-ALLOCATION	„Commands, Vol. 7“ [1]
SHOW-RESOURCE-REQUESTS	„Commands, Vol. 7“ [1]
SHOW-RESTART-OPTIONS	„Commands, Vol. 7“ [1]
SHOW-RFA-CONNECTIONS	„Commands, Vol. 7“ [1], „RFA“ [31]
SHOW-SDF-OPTIONS	„Commands, Vol. 7“ [1]
SHOW-SDF-PARAMETERS	„Commands, Vol. 7“ [1]
SHOW-SELECTED-PRODUCT-VERSION	„Commands, Vol. 7“ [1], „IMON“ [19]
SHOW-SHARED-PUBSET	„Commands, Vol. 7“ [1]
SHOW-SPACE-SATURATION-LEVELS	„Commands, Vol. 7“ [1]
SHOW-SPOOL-CHARACTER-SETS	„Commands, Vol. 7“ [1], „SPOOL“ [42]
SHOW-SPOOL-DEVICES	„Commands, Vol. 7“ [1], „SPOOL“ [42]
SHOW-SPOOL-FILTERS	„Commands, Vol. 7“ [1], „SPOOL“ [42]
SHOW-SPOOL-FORMS	„Commands, Vol. 7“ [1], „SPOOL“ [42]
SHOW-SPOOL-PARAMETERS	„Commands, Vol. 7“ [1], „SPOOL“ [42]
SHOW-STORAGE-CLASS	„Commands, Vol. 7“ [1]
SHOW-SUBSYSTEM-ATTRIBUTES	„Commands, Vol. 7“ [1]
SHOW-SUBSYSTEM-STATUS	„Commands, Vol. 7“ [1]
SHOW-SYNTAX-VERSIONS	„Commands, Vol. 7“ [1]
SHOW-SYSEVENT-LOG-ATTRIBUTES	„Commands, Vol. 7“ [1]
SHOW-SYSTEM-FILE-ASSIGNMENTS	„Commands, Vol. 7“ [1]
SHOW-SYSTEM-INFORMATION	„Commands, Vol. 7“ [1]
SHOW-SYSTEM-PARAMETERS	„Commands, Vol. 7“ [1]

Command	Manual in which it is described
SHOW-SYSTEM-STATUS	„Commands, Vol. 7“ [1]
SHOW-TAPE-STATUS	„Commands, Vol. 7“ [1]
SHOW-TERMINAL-ATTRIBUTES	„Commands, Vol. 7“ [1]
SHOW-TERMINAL-OPTIONS	„Commands, Vol. 7“ [1]
SHOW-TRACE-STATUS	„Commands, Vol. 7“ [1]
SHOW-USER-ATTRIBUTES	„Commands, Vol. 7“ [1], „SECOS“ [35]
SHOW-USER-STATUS	„Commands, Vol. 7“ [1]
SHOW-VOLUME-SET-LIST	„Commands, Vol. 7“ [1]

2.16.4 Notes on conventions used in the tables

The S variable tables are sorted according to the names of the S variables in the second column; this column has a gray background.

In the S variable tables, the entries in the columns “Name of the S variable”, “T” and “Contents” are represented using conventions explained in the overview below.

Example

Output information	Name of the S variable	T	Contents	Condition
Name of guard with shown access conditions	var(*LIST).GUARD-NAME	S	" <filename 1..40>	INF=ADM
Scope of use for a guard: *HOST-SYS: anyone may use the guard *USER-GROUP: members of the owner's user group may use the guard *USER-ID: only the owner may use the guard	var(*LIST).SCOPE	S	" *HOST-SYS *USER-GROUP *USER-ID	INF=ALL/ATT

2.16.4.1 Conventions used in the tables

Convention	Meaning	Examples
UPPERCASE	Uppercase letters are used for the following: <ul style="list-style-type: none"> – names of S variables – S variable data types – keywords – the list structure identifier 	<ul style="list-style-type: none"> – GUARD-NAME – S – *NO – ACTIVE – (*LIST)
lowercase	Lowercase letters are used for the following: <ul style="list-style-type: none"> – the name of the variable declared by the user – contents of S variables 	<ul style="list-style-type: none"> – var – <filename 1..54> – <integer> – <host-name>
< >	Angle brackets enclose the contents of S variables.	<integer> <host-name>
(*LIST)	An S variable with the (*LIST) extension is an element in a list.	var(*LIST)

2.16.4.2 S variable data types

The “T” column of the S variable tables denotes the data type: S(string), I(integer) or B(boolean). The table below contains the character set which belongs to each data type and the notation used for S variable contents in the “Contents” column of the S variable tables.

Data type	Character set	Notes
String	all EBCDIC characters	<p>Strings in the table are shown without quotes. The following string contents are possible:</p> <ul style="list-style-type: none"> – an SDF data type, e.g. . <name 1..8> <c-string 1..8> <filename 1..54> In this case the applicable character set is as described in the SDF syntax diagram/table “Data types” on page 1-41. – a descriptive name, e.g. <tsn>, <host-name>, <server-name> – numbers – keywords with and without the leading asterisk (*), e.g. *LEFT-TO-RIGHT ACTIVE – a null string "
Integer	[+-] 0..2147483647	<p>Integers in the table are shown as follows:</p> <ul style="list-style-type: none"> – SDF data type with range, e.g. <integer 0..255> – SDF data type without range <integer>
Boolean	FALSE TRUE	Boolean values in the table are shown as TRUE and FALSE.

2.16.4.3 Explanation of the columns

Column: Output information

Output information			
---------------------------	--	--	--

This column provides notes on the contents of the S variable. If the contents and name of the S variable are self-explanatory, the notes are often restricted to one or two key terms. If the relationship between the contents and name of the S variable is not sufficiently obvious, more information is given about the contents of the S variable. If the possible contents of an S variable are *YES or *NO, the explanation may be formulated as a question, which can be answered with Yes or No.

Column: Name of the S variables

	Name of the S variable		
--	-------------------------------	--	--

This column contains the alphabetically arranged names of the S variables. The order within the S variable table is governed by this column.

The names of the S variables consist of at least two subnames. In this manual the first subname is consistently given as var(*LIST); the actual name can be freely selected by the user within the terms of the SDF-P naming conventions. This S variable must always be declared as a list variable.

The full name of the S variable is composed of var(*LIST) and the command-specific preset S variable name. These names match the corresponding operand names or unique abbreviations as closely as possible. The subnames are separated by a dot. The preset S variable name may in turn comprise several subnames, similarly separated by dots. If the structure elements on this level form a list, the subname is also given the extension (*LIST).



The extension (*LIST) indicates that the S variable is an element in a list. (*LIST) appears when the contents of the S variable are displayed with the `SHOW-VARIABLE` command. You must not include (*LIST) in an assignment.

Column: T

		T	
--	--	---	--

This column indicates the data type of the S variable.

The possible values are:

S: String

I: Integer

B: Boolean

The data type specifies the character set from which the contents of an S variable come (see the “[Convention](#)” table on [page 1-127](#)).

Column: Contents

		Contents	
--	--	-----------------	--

This column lists the contents of the S variable. These contents match the corresponding operand values or unique abbreviations as closely as possible. The notational conventions are partly based on the customary SDF data type notation (e.g. <filename 1..54>, see [table “Data types” on page 1-41](#)) and partly make use of names descriptive of the contents of the S variables (such as <tsn>). For further conventions refer to the table [Convention](#), “Notes” column, on [page 1-127](#).

Column: Condition

			Condition
--	--	--	------------------

With some commands there is an operand (usually INFORMATION) which identifies the S variables which are to be assigned values on output. These operand conditions are either noted directly in this column or are referenced there by means of a code number and/or letter. The association between this code and the corresponding operand value is explained above the S variable table.

2.17 SDF-P-BASYS

The software product SDF-P extends the BS2000 command language to the status of a programming language which enables structured programming in a manner analogous to higher programming languages. SDF-P incorporates the following major elements:

- Structured procedure format (S procedures)
- data structures, data types
- Variables concept (S variables)
- function calls (builtin functions)
- block-oriented error handling
- control structures
- source and object procedures

The software product SDF-P comprises the nonchargeable subsystem SDFPBASY and the chargeable subsystem SDF-P. The following sections describe the scope of SDF-P as it affects the subsystem SDFPBASY. A detailed description of the chargeable SDF-P capabilities and how to use them can be found in the “SDF-P” manual [34].

The following description is valid for SDF-P V2.5.

Coexistence of SDF-P and SDF-P-BASYS

SDFPBASY subsystem can run with earlier SDF-P versions. In other words, migration of SDFPBASY does not necessarily require the chargeable subsystem SDF-P to be migrated.

New SDF-P versions require the same or a higher version of SDFPBASY. In other words, migration of the chargeable subsystem SDF-P requires the free subsystem SDFPBASY to be migrated.

2.17.1 Structured procedure format (S procedures)

S procedures consist of a procedure header and a procedure body. Logically associated blocks can be defined in both parts. The first record in an S procedure must be a command.

The procedure header normally begins with the SET-PROCEDURE-OPTIONS command, which is used to define the procedure attributes. If no explicit specifications are made, the default values for this command apply implicitly. Once the procedure attributes have been defined, the DECLARE-PARAMETER command can be used to define symbolic parameters, which are replaced by the values of the like-named S variables during execution.

Processing of the commands, SDF statements and input data is terminated by the CANCEL-PROCEDURE or EXIT-PROCEDURE command or by the last record. If an error occurs, SDF error recovery is triggered (see [section “Block-oriented error recovery” on page 1-133](#)).

Compiled procedures

Two different procedure formats are possible:

- Source procedure The S procedure is available in the original text form. The full range of SDF-P functions is available only if the chargeable subsystem SDF-P is loaded when the procedure is called. In libraries, element type J should be used for source procedures. (If SDF-P is not loaded, all SDF-P commands in source procedures are subjected to a syntax analysis, with the exception of chargeable control flow commands and the COMPILE-PROCEDURE command. All chargeable commands and functions are not rejected until execution time.)
- Object procedure With the aid of the COMPILE-PROCEDURE command, a source procedure can be compiled in an intermediate format. The COMPILE-PROCEDURE command is part of the chargeable SDF-P subsystem. The object procedure can utilize the full functionality of SDF-P (apart from the COMPILE-PROCEDURE command) irrespective of whether the SDF-P subsystem is currently available or not. In libraries, element type SYSJ (the default for COMPILE-PROCEDURE) should be used for source procedures.

2.17.2 Block-oriented error recovery

In contrast to non-S procedures, problem-specific error recovery is possible in S procedures, namely at command level.

Error recovery in S procedures is block-oriented, i.e. it is implemented on block level. In the case of nested blocks, error recovery can be performed for each block level. However, it can also be called exclusively for higher-ranking, surrounding blocks. In this case, the errors detected in inner blocks are passed to these blocks and processed there.

In SDF-P-BASYS the IF-BLOCK-ERROR command makes it possible to initiate block-oriented error recovery in an *S procedure*. The command block initiated in this way must be terminated by an END-IF command.

When error recovery is initiated, control branches in SDF-P-BASYS to the next IF-BLOCK-ERROR command (only the current command block or, in the case of nested blocks, also the higher-ranking command blocks are searched in the direction of the end of the procedure file). If no IF-BLOCK-ERROR is found, the procedure terminates when the end of the procedure file is reached. The error is passed to the caller. The error situation ends when an IF-BLOCK-ERROR block is encountered or when procedure level zero is reached.

For reasons of compatibility, the error situation is ended when a SET-JOB-STEP command is reached. In *non-S procedures* error recovery is still controlled via spin-off (see error recovery with the SET-JOB-STEP command).

Type of error recovery

The type of error recovery in an S procedure depends on what is specified in the ERROR-MECHANISM operand of the SET-PROCEDURE-OPTIONS command.

If nothing has been specified in the procedure with regard to ERROR-MECHANISM or if ERROR-MECHANISM=*SPIN-OFF-COMPATIBLE has been defined, SDF-P triggers error recovery if a command returns spin-off. In this case, error recovery is not dependent on the command return code. This error mechanism is preset and means that S procedures do not change their error behavior if commands in the procedures return a command-specific return code in a follow-up version for the first time.

If ERROR-MECHANISM=*BY-RETURNCODE has been set, SDF-P triggers error recovery if a command returns a return code with a subcode not equal to zero. In this case, error recovery is **not** dependent on the command's spin-off behavior.. This error mechanism must be defined explicitly.

2.17.3 Variables concept (S variables)

An S variable is a named data object that can be addressed via its name and whose value can be modified. A distinction is made between *simple* S variables and *composite* S variables. Composite S variables are made up of two or more S variables under the same name in the form of a list, an array or a structure. Only *simple* S variables are possible under SDF-P-BASYS (see the “SDF-P” manual [34]).

An S variable is uniquely identified by its name, the variable type and the scope.

2.17.3.1 Variable name

The following applies to simple S variables:

```
variablename = <structured-name 1..20>
```

The following applies to composite S variables:

```
variablename = <composed-name 1..255>
```

The name is formatted in accordance with the SDF data type <composed-name>. The following restrictions should be borne in mind:

- Names of structured S variables are formed in accordance with <structured-name> and can be up to 20 characters long.
- SDF-P only supports special characters in variable names internally. The dollar sign (\$) is reserved as the first character for TPR variables (task-privileged) and the hash character (#) is reserved as the identifier for composite variables (arrays and lists).
- The string **SYS** at the start of a name is reserved for system components.
- Keywords which are used as operators or Boolean constants are not permitted as variable names. This applies to: AND, DIV, EQ, FALSE, GE, GT, LE, LT, MOD, NE, NO, NOT, OFF, ON, OR, TRUE, XOR and YES

2.17.3.2 Variable type

A simple S variable can be one of the following three types:

- STRING with the value range <c-string 0..4096>
- INTEGER with the value range <integer -2147483648..2147483647>
- BOOLEAN with the value TRUE or FALSE

These three types are subject to a rigid set of type rules: a variable type can only be converted to a different type by means of builtin functions (see the “SDF-P” manual [34]).

In addition, there is also the variable type ANY. In this case, the variable is given the same type as the value assigned to it. The current type can be changed at any time by means of an assignment.

2.17.3.3 Scope

There are three scopes for S variables:

- INCLUDE: Variables declared within an S procedure called with INCLUDE-PROCEDURE are only valid within this procedure (component of the chargeable subsystem SDF-P).
- PROCEDURE: The variables can be used locally in procedures or in interactive mode. Procedure parameters of an S procedure called with CALL-PROCEDURE are automatically local for that procedure. If the procedure is interrupted (e.g. by [K2](#)), the local variables of the procedure can also be accessed and modified in interactive mode.
- TASK: The variables are defined as task-local and can be processed in all procedures and in interactive mode (only available with SDF-P).

2.17.3.4 Declaration

When first declared, an S variable is created in class 5 memory. Its lifespan is determined by its scope. For example, a procedure-local variable ceases to exist when the procedure is terminated. At the most, an S variable continues to exist until the task is terminated. The contents of a variable can be stored permanently in a job variable (chargeable component) or in a variable container (available with SDF-P-BASYS). An S variable can be declared implicitly or explicitly.

Implicit declaration means that the S variable is created automatically by assigning it a value. This is possible only if IMPLICIT-DECLARATION=*YES has been specified (see the SET-PROCEDURE-OPTIONS command). Variables declared implicitly are of the type ANY.

S variables are declared explicitly (as procedure parameters) by means of the DECLARE-PARAMETER command in the procedure header of an S procedure. The DECLARE-VARIABLE command declares S variables explicitly.

2.17.3.5 Expressions

An expression defines how a new value is calculated from existing values. An expression is created by linking base terms with operators. Base terms can be:

- <c-string>
- <x-string>
- Boolean constants with ON, TRUE, YES for Boolean one and with OFF, FALSE, NO for Boolean zero
- the name of an S variable
- the function call of a builtin function

Depending on what operators are used, a distinction is made between:

- string expressions
- arithmetic expressions
- comparison expressions
- logical expressions

Only comparison expressions and logical expressions (negation only) are possible with SDF-P-BASYS. The other expressions are described in the “SDF-P” manual [34].

Comparison expressions have the format:

(expression₁ operator expression₂)

expression₁ or *expression₂* can be any expressions (base term or a permissible expression), but they must be of the same type. If they are not, an error message is issued and SDF-P error recovery is triggered.

The following *operators* are possible:

LT	or	<			less than
LE	or	<=			less than or equal to
EQ	or	=	or	==	equal to
NE	or	<>			not equal to
GT	or	>			greater than
GE	or	>=			greater than or equal to

The complete expression must be enclosed in parentheses. Operators must be enclosed in blanks.

The result of a comparison is of the type BOOLEAN, i.e. it is either TRUE or FALSE.

Strings are compared byte by byte and from left to right. The comparison is based on the position of the characters in EBCDIC code. The result is determined by the first non-match. No further characters are compared after that. If no differences are detected up to the final character in the shorter of the operands, the longer operand is larger. Operands are equal if all of their characters match up.

Example

A = 'ABC'	
B = 'ABCDE'	
(B > A)	→ result TRUE
('A' = X'C1')	→ result TRUE
(B > '1')	→ result FALSE
C = (A = B)	→ variable C has FALSE

A logical operator links expressions of the type BOOLEAN. Only the logical operator NOT is available with SDF-P-BASYS; this returns the negation of an expression as the result:

NOT(expression₁)

Example

A = 'AB'	
B = 'ABCD'	
(B > A)	→ result TRUE
NOT(B > A)	→ result FALSE

Note

The term “string expression”, which is used as a parameter in builtin functions, can have the following values:

- a string enclosed in apostrophes (<c-string>)
- the name of a variable containing a string (<composed-name>)
- an expression returning a string as the result

Example

/JV-NAME = 'MY-JV'	
/MY-VAR = JV('JV-NAME')	→ Value of the job variable JV-NAME
/MY-VAR = JV(JV-NAME)	→ Value of the job variable MY-JV
/MY-VAR = JV('&JV-NAME')	→ Value of the job variable MY-JV
/MY-VAR = JV(JV(JV-NAME))	→ Value of the job variable whose name is stored in the job variable MY-JV

2.17.4 Builtin functions

SDF uses builtin functions (predefined functions) both for editing S variables and character strings and for determining environment information. A builtin function forms precisely one return value from input parameters (if available) and environment information. With certain builtin functions, the type of return value is dependent on the input parameters.

Calling a builtin function without parameters: `function()`

Specification of the parentheses is optional. If they are omitted, however, *function* must not be an S variable name, as otherwise the value of the like-named S variable will be returned.

Calling a builtin function with parameters:

```
function(symvar1=value1 . . . . , symvarn=valuen)
```

where *symvari* ($i = 1 \dots n$) is the name of the i -th parameter and *value_i* is the value of the i -th parameter. An expression can also be specified as a parameter value. Parameters can be specified as keyword parameters or as positional parameters. Parameter names (i.e. keywords) can be abbreviated as desired as long as they remain unambiguous. Function names, on the other hand, can only be abbreviated if this is explicitly described in the builtin function. The builtin functions available with the subsystem SDF-P-BASYS are described below. For a description of all available builtin functions and how to use them, see the "SDF-P" manual [34].

The following overview lists all builtin functions available with SDF-P-BASYS:

Name of the builtin function	Function
INSTALLATION-PATH()	Output path name
IS-CATALOGED-JV()	Interrogate job variable
IS-INITIALIZED()	Check variable initialization
IS-SDF-P()	Check whether SDF-P is loaded
JV()	Interrogate job variable
MAINCODE()	Interrogate error code
MSG()	Output message text
SDF-P-VERSION()	Interrogate SDF-P or SDF-P-BASYS version
SUBCODE1()	Interrogate subcode1
SUBCODE2()	Interrogate subcode2

INSTALLATION-PATH() Output path name

Domain: **Environment information**

The INSTALLATION-PATH() function outputs the pathname that has been assigned from the SCI for the logical name of a file (installation item) that belongs to a particular product version.

The assignment of a pathname to a logical name is only available if the file is a component of a product that was installed with IMON. The assignment can also be entered in the SCI by systems support using the SET-INSTALLATION-PATH command. For more details, see the “IMON” manual [19].

An expression must be specified in the DEFAULT-PATH-NAME operand which is returned as an alternative result if no pathname has been assigned (the product is not registered in the SCI or no file exists for the logical name specified).

Format

```
INSTALLATION-PATH( )
```

```
LOGICAL-ID = string_expression  
,INSTALLATION-UNIT = string_expression  
,VERSION = *STD / string_expression  
,DEFAULT-PATH-NAME = string_expression
```

Result type

STRING

Input parameters

LOGICAL-ID = string_expression

Designates the logical name of the file (installation item) whose pathname is to be output (e.g. SYSPRG).

INSTALLATION-UNIT = string_expression

Designates the product name (name of the installation unit).

VERSION = *STD / string_expression

Designates the product version (up to 8 characters). A version can be specified explicitly in the *[V][m]m.naso* format (see also SDF data type composed-name). If the specified version does not exist in the SCI, the function call is aborted without returning a result (or an alternative character string).

DEFAULT-PATH-NAME = string_expression

Determines the alternative character string (e.g. a pathname that definitely exists) that is output if no assigned pathname is available (product or installation item is not registered in the SCI).

Result

A string conforming to the rules for the SDF data type <filename 1..54>.

Error messages

```
SDP0469   INVALID PARAMETER '(&00)' SPECIFIED
SDP0470   INTERNAL ERROR RETURNED BY GETINSP/GETINSV INTERFACE. RETURN CODE
          '(&00)' RECEIVED
SDP0489   Warning: Installation-Unit '(&00)' not found in IMON Software
          Inventory. Default value assumed
SDP0490   Installation-Unit '(&00)' version '(&01)' not found
SDP0491   Warning: Logical-id '(&00)' not found in Installation-Unit '(&01)'
          version '(&02)'. Default value assumed
```

Examples

```
/A = INSTALLATION-PATH(LOGICAL-ID='SYSLNK',INSTALLATION-UNIT='EDT',
DEFAULT-PATH-NAME='*** no pathname available! ***')
/SHOW-VARIABLE A
A = :20SH:$TSOS.SYSLNK.EDT.171
```

The pathname of the load module library for the product EDT is output.

```
/A = INSTALLATION-PATH(LOGICAL-ID='SYSRME.D',INSTALLATION-UNIT='EDT',
DEFAULT-PATH-NAME='*** no readme file available! ***')
% SDP0491 Warning: Logical-id 'SYSRME.D' not found in Installation-Unit
'EDT' version '*STD'. Default value assumed
/SHOW-VARIABLE A
A = *** no readme file available! ***
```

IS-CATALOGED-JV() Interrogate job variable

Domain: **Job variables**

The IS-CATALOGED-JV() function checks whether a catalog entry exists for the specified job variable names, i.e. whether the specified job variable exists. This function can only be used if the JV subsystem has been loaded in the system. For more detailed information on job variables see the “Job Variables” manual [20].

Format

```
IS-CATALOGED-JV( )
```

```
IS-CAT-JV( )
```

```
JV = string_expression
```

```
,ERROR-REPORTING = *PROC-ERROR-MECHANISM / *RETURN-FALSE
```

```
,ERROR-VARIABLE = *NONE / string_expression
```

Result type

BOOLEAN

Input parameters

JV = string_expression

Designates a job variable. When a JV name is specified directly it must be enclosed in quotes.

ERROR-REPORTING =

In the event of an error, you can define whether error processing is triggered or the message code is stored in an S variable .

ERROR-REPORTING = *PROC-ERROR-MECHANISM

In the event of an error, error processing is triggered (see [section “Block-oriented error recovery” on page 1-133](#)).

ERROR-REPORTING = *RETURN-FALSE

In the event of an error, the result *FALSE* is output. An error message is not output. The message code of the error message is written to the variable specified in ERROR-VARIABLE =

ERROR-VARIABLE =

An S variable can be defined for the message code. The message code is only written to the variable if in the function call `ERROR-REPORTING=*RETURN-FALSE` is specified in the function call.

ERROR-VARIABLE = *NONE

No S variable is specified.

ERROR-VARIABLE = string_expression

The name of the S variable where the message code of the error message is written.

Note the following:

- If the variable name is directly specified, it must be enclosed in quotes. Otherwise the contents of the variable are interpreted as the variable name.
- Message codes are only written to the S variable if an error occurs (`result=FALSE`) and `ERROR-REPORTING=*RETURN-FALSE` was specified. Example of possible error codes: `SDP0439`, `SDP0440` or `DMSxxxx`.
- If an error occurs when writing to the S variable, the corresponding error message is output to `SYSOUT`, regardless of the specification in `ERROR-REPORTING` and the S variable contains no return value.

Result*TRUE*

The job variable designated in the JV parameter has been cataloged.

FALSE

The job variable designated in the JV parameter has not been cataloged or an error occurred when calling with `ERROR-REPORTING=*RETURN-FALSE`.

Error message

```
SDP0495    '(&00)' NOT A CORRECT JV NAME
```

```
SDP1054    JOB VARIABLE ERROR: JVS ERROR CODE '(&00)' WHILE ACCESSING JOB
           VARIABLE '(&01)'. IN SYSTEM MODE: /HELP-MSG JVS(&00)
```

Example

```
/IF (IS-CATALOGED-JV(JV='PS'))
/WRITE-TEXT 'EXISTS'
/ELSE
/WRITE-TEXT 'CREATE'
/END-IF
```

Output:

```
CREATE
```

IS-INITIALIZED() Check variable initialization

Domain: **Variable access / test functions**

The IS-INITIALIZED() function checks whether the specified variable has been initialized, i.e. whether its contents are valid. Even a null string is valid as the contents. A variable cannot be initialized unless it has been declared.

Format

IS-INITIALIZED()
VARIABLE-NAME = string_expression

Result type

BOOLEAN

Input parameters

VARIABLE-NAME = string_expression

Designates a variable. The variable name must be enclosed in apostrophes if it is specified directly, i.e. as a literal. A list variable must be identified in the form 'listenname#'. Individual list elements can be specified in the form 'listenname#elementindex'.

Result

TRUE

The variable designated by the VARIABLE-NAME parameter has been initialized.

FALSE

The variable designated by the VARIABLE-NAME parameter has not been initialized.

Error message

SDP1101 SYNTAX ERROR IN VARIABLE NAME

IS-SDF-P() Check whether SDF-P is loaded

Domain: **Test functions**

The IS-SDF-P() function checks whether SDF-P has been loaded in the system. If it has, the result TRUE is returned. The result FALSE is returned in the following cases:

- SDF-P has not been loaded.
- SDF-P is loaded but SDF-P-BASYS functionality is currently being simulated in the task (FUNCTIONALITY=*BASIC setting in the MODIFY-PROCEDURE-TEST-OPTIONS command, see “SDF-P” manual [34]).

If SDF-P has been loaded (i.e. the result is TRUE), it is possible to use functions or commands of the chargeable subsystem SDF-P in an IF branch (see example). However, this does not apply to chargeable control flow commands such as FOR, WHILE, REPEAT), since control flow commands are checked as part of pre-analysis, i.e. before the builtin function is called. If SDF-P is not loaded or SDF-P-BASYS functionality is being simulated, using the control flow command FOR, for example, will always result in an error.

Format

IS-SDF-P()

Result type

BOOLEAN

Input parameters

None

Result

TRUE

SDF-P has been loaded in the system.

FALSE

SDF-P has not been loaded in the system or SDF-P-BASYS functionality is being simulated in the task.

Error message

None

Example 1

```
/A = IS-SDF-P
/SHOW-VAR A
A = TRUE
```

Example 2

```
/SET-PROCEDURE-OPTIONS
.
.
.
/ IF (IS-SDF-P)
/   "In this IF branch, all commands and builtin"
/   " functions of SDF-P can be used."
/   "However, SDF-P control flow commands cannot"
/   " be used (e.g. FOR, WHILE, REPEAT)."
```

```
.
.
.
/ ELSE
/   "In the ELSE branch, only the basic functions of"
/   " SDF-P-BASYS can be used."
```

```
.
.
.
/ END-IF
.
.
.
```

JV() Interrogate job variable

Domain: **Job variable functions**

The JV function supplies the contents of the specified job variable or of a subsarea defined by the START and LENGTH parameters. The chargeable subsystem JV must be loaded and the user must have read authorization for the job variable.

Format

JV()
JV-NAME = string_expression ,START = <u>1</u> / arithm_expression ₁ ,LENGTH = *REST-LENGTH / arithm_expression ₂

Result type

STRING

Input parameters

JV-NAME = string_expression

Designates a job variable; "string_expression" must therefore be a valid job variable name or a JV link name identified by a preceding asterisk (*).

START = 1 / arithm_expression₁

Designates the start position of the subarea to be extracted. The default value is the first character. arithm_expression₁ must be a positive integer value which is less than the length of the JV value. If the value specified for arithm_expression₁ is not valid, a null string will be returned.

LENGTH = *REST-LENGTH / arithm_expression₂

Designates the length of the subarea to be extracted. The default value *REST-LENGTH indicates that the subarea to be extracted begins at the position specified by START and extends to the end. If arithm_expression₂ specifies a length differing from this which is too long, LENGTH = *REST-LENGTH is assumed implicitly.

Result

Contents of the job variable designated by “string_expression” or the part of it designated by “arithm_expression₁” and “arithm_expression₂”.

Error messages

SDP0412 START POSITION OUT OF RANGE
SDP0414 WARNING: *REST-LENGTH OF FUNCTION 'SUBSTRING' USED
SDP1022 JOB VARIABLE '...' NOT ACCESSIBLE
SDP1024 JOB VARIABLE '...' DOES NOT EXIST
SDP1027 VALUE FOR JOB VARIABLE '...' IS NOT A STRING
SDP1054 JOB VARIABLE ERROR: JVS ERROR CODE '...' WHILE ACCESSING
 JOB VARIABLE'...'. IN SYSTEM MODE: /HELP-MSG DMS...

MAINCODE() Interrogate error code

Domain: **Return codes**

The MAINCODE function returns the value of the maincode of the current retrun code. The maincode contains a message code which can be used to output the contents of the message. Output of the message contents can be initiated with the HELP-MSG-INFORMATION command or with the builtin function MSG(). If subcode1 is equal to zero, SDF-P does not report an error. In this case, a return code cannot be interpreted unless it has been saved with the SAVE-RETURNCODE command.

MAINCODE() or return codes in general cannot be interrogated outside of dialog blocks and procedures.

Format

MAINCODE() MC()

Result type

STRING (<string 7..7>)

Input parameters

None

Result

The value of the maincode is returned as the result in the form of a message code.

MSG() Output message text

Domain: **Return codes** (messages)

The MSG() function supplies the message text assigned to the specified message code; this is done in the specified language and in the specified output format.

For some SDF-P commands, the message code may have been previously requested from the command return code, using the MAINCODE() function.

Format

MSG()

```
MSG-IDENTIFICATION = string_expression
,LANGUAGE = *STD / *ENGLISH / *GERMAN
,INSERT-00 = *NONE / string_expression
,INSERT-01 = *NONE / string_expression
      :           :           :
,INSERT-29 = *NONE / string_expression
,MSG-STRUCTURE-OUTPUT = *NONE / *SYSMSG
```

Result type

STRING (<string>)

Input parameters

MSG-IDENTIFICATION = string_expression

string_expression contains the 7-byte message code in the following format:

Bytes 1-3: Letters identifying the message class

Bytes 4-7: Digits 0-9, letters A-F as the hexadecimal representation of the exact error number

LANGUAGE = *STD / *ENGLISH / *GERMAN

The message text is output in English or German. The default setting is *STD, i.e. the text is output in the language set for the task. The (former) operand values *E for *ENGLISH and *D for *GERMAN are still supported for reasons of compatibility.

INSERT-nn = *NONE / string_expression

Designates the additional content of a message.

MSG-STRUCTURE-OUTPUT =

Specifies whether or not variables for the output of messages must be created and sent on.

MSG-STRUCTURE-OUTPUT = *NONE

Variables for the output of messages are not sent on via S variable stream SYSMSG. The message text is not supplied by the command /HELP-MSG-INFORMATION MSG-ID=*LAST.

MSG-STRUCTURE-OUTPUT = *SYSMSG

If messages are guaranteed, variables for the output of messages are sent on via S variable stream SYSMSG. The message text can be obtained by the command /HELP-MSG-INFORMATION MSG-ID=*LAST.

Result

Message text in the form of a string.

Null string ("") means, that no text has been assigned to this message code.

Error messages

SDP0413 ILLEGAL LENGTH

SDP0418 INVALID MSG-IDENTIFICATION

Example

```
/A=MSG(MSG-IDENTIFICATION='SDP1018',"This message is guaranteed" -
/          INSERT-00='MY-VARIABLE', -
/          MSG-STRUCTURE-OUTPUT = *SYSMSG)
/B=MSG(MSG-IDENTIFICATION='SDP1010',"This message is NOT guaranteed" -
/          INSERT-00='MY-SECOND-VARIABLE', -
/          MSG-STRUCTURE-OUTPUT = *SYSMSG)
/SHOW-VARIABLE *ALL
A = % SDP1018 VARIABLE 'MY-VARIABLE' ALREADY EXISTS BUT WITH OTHER
ATTRIBUTES
B = % SDP1010 VARIABLE 'MY-SECOND-VARIABLE' HAS NO VALUE
*END-OF-CMD
```

SDF-P-VERSION() Interrogate SDF-P version

Domain: **Procedure information**

The SDF-P-VERSION() function provides information on the installed version of the (chargeable) subsystem SDF-P or on the current version of the subsystem SDF-P-BASYS contained in the basic configuration.

Format

SDF-P-VERSION()
FUNCTION-RANGE = <u>*STD</u> / *BASIC

Result type

STRING

Input parameters

FUNCTION-RANGE = *STD

Current version of the (chargeable) subsystem SDF-P, if this is loaded, otherwise the current SDF-P-BASYS version.

FUNCTION-RANGE = *BASIC

Current version of the subsystem SDF-P-BASYS contained in the basic configuration.

Result

Version information in the form of a string.

Error messages

None

Example

```
/A = SDF-P-VERSION
/B = SDF-P-VERSION(FUNCTION-RANGE=*BASIC)

/SHOW-VARIABLE (A,B)
A = V02.5C10
B = V02.5C10
```

SUBCODE1() Interrogate subcode1

Domain: **Return codes**

The SUBCODE1 function supplies the value of subcode1 of the current return code. A subcode1 not equal to zero means that an error has occurred, in which case SDF-P branches to the next IF-BLOCK-ERROR or IF-CMD-ERROR command (see corresponding descriptions). If subcode1 is equal to zero, SDF-P does not report an error. In this case, a return code cannot be interpreted unless it has been saved with the SAVE-RETURNCODE command.

SUBCODE1() is not available outside of procedures and dialog blocks.

Format

SUBCODE1(SC1()

Result type

INTEGER (<integer 0..255>)

Input parameters

None

Result

Designation of the error class in the form of an integer value <integer 0..255>

0

No error has occurred in the current procedure or the return code was saved with /SAVE-RETURNCODE after an error-free command.

SUBCODE2() Interrogate subcode2

Domain: **Return codes**

The SUBCODE2 function supplies the value of subcode2 of the current return code. Subcode2 can contain additional information. If subcode1 is equal to zero, SDF-P does not report an error. In this case, a return code cannot be interpreted unless it has been saved with the SAVE-RETURNCODE command.

SUBCODE2() is not available outside of procedures and dialog blocks.

Format

SUBCODE2() SC2()

Result type

INTEGER (<integer 0..255>)

Input parameters

None

Result

Value of subcode2 as an integer value (<integer 0..255>)

2.17.5 Commands supported by SDF-P-BASYS

The following table contains all SDF-P commands which are available with the nonchargeable subsystem SDF-P-BASYS. The commands are described in this “Commands” manual.

Command	Brief description
ASSIGN-STREAM	Assign S variable stream
BEGIN-PARAMETER-DECLARATION	Initiate declaration of procedure parameters in procedure header
CALL-PROCEDURE	Start command sequence
CLOSE-VARIABLE-CONTAINER	Close variable container
DECLARE-PARAMETER	Declare procedure parameters
DECLARE-VARIABLE	Declare variable
DELETE-VARIABLE	Delete a variable
ELSE	Initiate ELSE branch in IF block
END-IF	Terminate IF block
END-PARAMETER-DECLARATION	Terminate declaration of procedure parameters
EXIT-PROCEDURE	Terminate procedure
GOTO	Branch to marker
IF	Initiate IF block
IF-BLOCK-ERROR	Initiate block error recovery
MODIFY-PROCEDURE-OPTIONS (only with the SUPPRESS-SDP-MSG operand)	Modify procedure options during program execution
OPEN-VARIABLE-CONTAINER	Open variable container stored as PLAM library element
SAVE-RETURNCODE	Save current command return code
SAVE-VARIABLE-CONTAINER	Save variable container
SET-PROCEDURE-OPTIONS	Define procedure attributes
SET-VARIABLE	Assign value to variable
SHOW-VARIABLE	Output contents of variable

2.17.6 Subsystem installation

The following files are delivered along with SDF-P-BASYS V2.5:

File name	Contents
SIPLIB.SDF-P-BASYS.025	Library for privileged interfaces
SKMLNK.SDF-P-BASYS.025	Independent part of SDF-P-BASYS, which is loaded automatically at startup (for SQ servers)
SYSLIB.SDF-P-BASYS.025	SDF-P-BASYS Assembler macros
SYSLNK.SDF-P-BASYS.025	Independent part of SDF-P-BASYS, which is loaded automatically at startup (for S servers)
SYSMES.SDF-P-BASYS.025	Message file containing SDF-P messages
SYSPRC.SDF-P-BASYS.025	Procedures for SDF-P-BASYS (e.g. FHDR)
SYSRMS.SDF-P-BASYS.025	RMS delivery sets for SDF-P-BASYS
SYSSDF.SDF-P-BASYS.025	Syntax file containing only commands which SDF-P-BASYS executes itself
SYSSII.SDF-P-BASYS.025 ¹⁾	Structure and installation information file of IMON
SYSSSC.SDF-P-BASYS.025	SSCM catalog which defines the SDF-P-BASYS subsystem

¹⁾ After SYSSII files have been successfully installed on the target system they are deleted. They are, however, saved in the \$SYSSAG.SOLLIB.IMON.SYSSII library as X elements.

IMON installation information for SDF-P-BASYS

Logical IMON name	Default file name
SIPLIB	\$TSOS.SIPLIB.SDF-P-BASYS.025
SYSLIB	\$TSOS.SYSLIB.SDF-P-BASYS.025
SYSLNK	\$TSOS.SYSLNK.SDF-P-BASYS.025
SYSLNK	\$TSOS.SKMLNK.SDF-P-BASYS.025
SYSMES	\$TSOS.SYSMES.SDF-P-BASYS.025
SYSPRC	\$TSOS.SYSPRC.SDF-P-BASYS.025
SYSREP	\$TSOS.SYSREP.SDF-P-BASYS.025
SYSRMS	\$TSOS.SYSRMS.SDF-P-BASYS.025
SYSSDF	\$TSOS.SYSSDF.SDF-P-BASYS.025
SYSSII	\$TSOS.SYSSII.SDF-P-BASYS.025 ¹⁾
SYSSSC	\$TSOS.SYSSSC.SDF-P-BASYS.025

¹⁾ After SYSSII files have been successfully installed on the target system they are deleted. They are, however, saved in the \$SYSSAG.SOLLIB.IMON.SYSSII library as X elements.

3 Overviews

This chapter contains the following overviews:

- [Overview of the versions](#)
- [Overview of main functions of the BS2000 commands](#)
- [Domains](#)
- [Commands and their privileges](#)
- [Command aliases](#)
- [Commands of internal components](#)

3.1 Overview of the versions

Command	Component and version	Page
ADD-ACS-SYSTEM-FILE	ACS V19.0A	2-7
ADD-ALIAS-CATALOG-ENTRY	ACS V19.0A	2-10
HOLD-ALIAS-SUBSTITUTION	ACS V19.0A	3-387
LOAD-ALIAS-CATALOG	ACS V19.0A	3-495
MODIFY-ACS-OPTIONS	ACS V19.0A	4-17
MODIFY-ACS-SYSTEM-FILE	ACS V19.0A	4-23
MODIFY-ALIAS-CATALOG-ENTRY	ACS V19.0A	4-26
PURGE-ALIAS-CATALOG	ACS V19.0A	5-97
REMOVE-ACS-SYSTEM-FILE	ACS V19.0A	5-115
REMOVE-ALIAS-CATALOG-ENTRY	ACS V19.0A	5-116
RESUME-ALIAS-SUBSTITUTION	ACS V19.0A	5-229
SET-FILE-NAME-PREFIX	ACS V19.0A	5-318
SHOW-ACS-OPTIONS	ACS V19.0A	5-392
SHOW-ACS-SYSTEM-FILES	ACS V19.0A	5-397
SHOW-ALIAS-CATALOG-ENTRY	ACS V19.0A	5-426
SHOW-FILE-NAME-PREFIX	ACS V19.0A	6-159
START-ACS	ACS V19.0A	7-401
STORE-ALIAS-CATALOG	ACS V19.0A	7-549
MODIFY-TEST-OPTIONS	AIDSYSA V19.0A	4-474
RESUME-PROGRAM	AIDSYSA V19.0A	5-247
SHOW-LIVE-MIGRATION-HISTORY	AIDSYSA V19.0A	6-320
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MODIFY-ASE-PARAMETERS	ASE V1.0B	4-30
REMOVE-ASE-ELEMENT	ASE V1.0B	5-118
SHOW-ASE-ELEMENT	ASE V1.0B	5-430
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SHOW-ASE-PARAMETERS	ASE V1.0B	5-435
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CANCEL-PROGRAM	BLSSERV V2.8A	2-240
LOAD-EXECUTABLE-PROGRAM	BLSSERV V2.8A	3-501

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RESET-DBL-DEFAULTS	BLSSERV V2.8A	5-183
SET-REPROG-READ-MARK	BLSSERV V2.8A	5-366
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ACTIVATE-SNAPSHOT	BS2000 OSD/BC V10.0A	2-3
ADAPT-SNAPSET-ACCESS	BS2000 OSD/BC V10.0A	2-5
ADD-CATALOG-FILE	BS2000 OSD/BC V10.0A	2-24
ADD-CHANGE-DATE	BS2000 OSD/BC V10.0A	2-26
ADD-CONSOLE-FILTER	BS2000 OSD/BC V10.0A	2-34
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ADD-DEVICE-DEPOT	BS2000 OSD/BC V10.0A	2-40
ADD-FILE-LINK	BS2000 OSD/BC V10.0A	2-43
ADD-IO-UNIT	BS2000 OSD/BC V10.0A	2-89
ADD-ISAM-POOL-LINK	BS2000 OSD/BC V10.0A	2-100
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CANCEL-PUBSET-EXPORT	BS2000 OSD/BC V10.0A	2-241
CANCEL-PUBSET-IMPORT	BS2000 OSD/BC V10.0A	2-242
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CHANGE-ACCOUNTING-FILE	BS2000 OSD/BC V10.0A	2-246
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CHANGE-FILE-LINK	BS2000 OSD/BC V10.0A	2-254
CHANGE-HEL-FILE	BS2000 OSD/BC V10.0A	2-258
CHANGE-SERSLOG-FILE	BS2000 OSD/BC V10.0A	2-262
CHANGE-STORAGE-CLASS-CATALOG	BS2000 OSD/BC V10.0A	2-264
CHANGE-TAPE-MOUNT	BS2000 OSD/BC V10.0A	2-266
CHANGE-TASK-CPU-LIMIT	BS2000 OSD/BC V10.0A	2-269
CHANGE-TASK-PRIORITY	BS2000 OSD/BC V10.0A	2-272
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CHECK-FILE-CONSISTENCY	BS2000 OSD/BC V10.0A	2-279
CHECK-IMPORT-DISK-FILE	BS2000 OSD/BC V10.0A	2-282
CHECK-PUBSET-MIRRORS	BS2000 OSD/BC V10.0A	2-288
CHECK-SNAPSET-CONFIGURATION	BS2000 OSD/BC V10.0A	2-290
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COMPARE-DISK-FILES	BS2000 OSD/BC V10.0A	2-298
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CONNECT-CMD-SERVER	BS2000 OSD/BC V10.0A	2-304
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CREATE-FILE	BS2000 OSD/BC V10.0A	2-380
CREATE-FILE-GENERATION	BS2000 OSD/BC V10.0A	2-428
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CREATE-ISAM-POOL	BS2000 OSD/BC V10.0A	2-460
CREATE-PAGING-FILE	BS2000 OSD/BC V10.0A	2-479
CREATE-SNAPSET	BS2000 OSD/BC V10.0A	2-481
CREATE-STORAGE-CLASS	BS2000 OSD/BC V10.0A	2-483
CREATE-TAPE-SET	BS2000 OSD/BC V10.0A	2-489
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DELETE-ALTERNATE-INDEX	BS2000 OSD/BC V10.0A	3-3
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DELETE-ISAM-POOL	BS2000 OSD/BC V10.0A	3-128
DELETE-PAGING-FILE	BS2000 OSD/BC V10.0A	3-155
DELETE-SNAPSET	BS2000 OSD/BC V10.0A	3-157
DELETE-STORAGE-CLASS	BS2000 OSD/BC V10.0A	3-159
DELETE-SYSTEM-FILE	BS2000 OSD/BC V10.0A	3-166
DELETE-TAPE-SET	BS2000 OSD/BC V10.0A	3-171
DELETE-VOLUME-SET-LIST	BS2000 OSD/BC V10.0A	3-174
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EDIT-FILE-ATTRIBUTES	BS2000 OSD/BC V10.0A	3-192
EDIT-FILE-GENERATION-SUPPORT	BS2000 OSD/BC V10.0A	3-193
EDIT-FILE-GROUP-ATTRIBUTES	BS2000 OSD/BC V10.0A	3-194
EDIT-FILE-LINK	BS2000 OSD/BC V10.0A	3-195
EDIT-JOB	BS2000 OSD/BC V10.0A	3-197
EDIT-JOB-OPTIONS	BS2000 OSD/BC V10.0A	3-199
EDIT-MASTER-CATALOG-ENTRY	BS2000 OSD/BC V10.0A	3-205
EDIT-PUBSET-CACHE-ATTRIBUTES	BS2000 OSD/BC V10.0A	3-210
EDIT-PUBSET-DEFINITION-FILE	BS2000 OSD/BC V10.0A	3-212
EDIT-PUBSET-SPACE-DEFAULTS	BS2000 OSD/BC V10.0A	3-213
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EXPORT-FILE	BS2000 OSD/BC V10.0A	3-291
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EXTEND-TAPE-SET	BS2000 OSD/BC V10.0A	3-352
FORCE-DESTROY-CACHE	BS2000 OSD/BC V10.0A	3-354
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FORCE-PUBSET-EXPORT	BS2000 OSD/BC V10.0A	3-362
HOLD-HARDWARE-AUDIT	BS2000 OSD/BC V10.0A	3-390
HOLD-JOB	BS2000 OSD/BC V10.0A	3-392
HOLD-JOB-CLASS	BS2000 OSD/BC V10.0A	3-394
HOLD-JOB-STREAM	BS2000 OSD/BC V10.0A	3-396
HOLD-LINKAGE-AUDIT	BS2000 OSD/BC V10.0A	3-398
HOLD-TASK	BS2000 OSD/BC V10.0A	3-412
IMPORT-FILE	BS2000 OSD/BC V10.0A	3-422
IMPORT-NODE-FILE	BS2000 OSD/BC V10.0A	3-442
IMPORT-PUBSET	BS2000 OSD/BC V10.0A	3-446
INCLUDE-DEVICE-CONNECTION	BS2000 OSD/BC V10.0A	3-462
INFORM-ALL-JOBS	BS2000 OSD/BC V10.0A	3-465
INFORM-JOB	BS2000 OSD/BC V10.0A	3-467
INFORM-OPERATOR	BS2000 OSD/BC V10.0A	3-470
INFORM-PROGRAM	BS2000 OSD/BC V10.0A	3-472
LIST-CATALOG-ENTRY	BS2000 OSD/BC V10.0A	3-475
LIST-FILE-FROM-SNAPSET	BS2000 OSD/BC V10.0A	3-477
LIST-JV-FROM-SNAPSET	BS2000 OSD/BC V10.0A	3-482
LIST-NET-DIRECTORIES	BS2000 OSD/BC V10.0A	3-486
LIST-NODE-FILES	BS2000 OSD/BC V10.0A	3-490
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MODIFY-FILE-ATTRIBUTES	BS2000 OSD/BC V10.0A	4-49
MODIFY-FILE-GENERATION-SUPPORT	BS2000 OSD/BC V10.0A	4-104
MODIFY-FILE-GROUP-ATTRIBUTES	BS2000 OSD/BC V10.0A	4-116
MODIFY-HEL-CHECK	BS2000 OSD/BC V10.0A	4-134
MODIFY-HEL-LOGGING	BS2000 OSD/BC V10.0A	4-139
MODIFY-HEL-TELESERVICE-ALARM	BS2000 OSD/BC V10.0A	4-143
MODIFY-IO-UNIT	BS2000 OSD/BC V10.0A	4-149
MODIFY-ISAM-CACHING	BS2000 OSD/BC V10.0A	4-154
MODIFY-JOB	BS2000 OSD/BC V10.0A	4-156
MODIFY-JOB-CLASS	BS2000 OSD/BC V10.0A	4-178
MODIFY-JOB-OPTIONS	BS2000 OSD/BC V10.0A	4-181
MODIFY-JOB-STREAM	BS2000 OSD/BC V10.0A	4-189
MODIFY-JOB-SWITCHES	BS2000 OSD/BC V10.0A	4-191
MODIFY-MASTER-CATALOG-ENTRY	BS2000 OSD/BC V10.0A	4-214
MODIFY-MEMORY-PARAMETERS	BS2000 OSD/BC V10.0A	4-222
MODIFY-MOUNT-PARAMETER	BS2000 OSD/BC V10.0A	4-233
MODIFY-MSG-OPTIONS	BS2000 OSD/BC V10.0A	4-242
MODIFY-MSG-SUBSCRIPTION	BS2000 OSD/BC V10.0A	4-245
MODIFY-PAGING-AREA-ATTRIBUTES	BS2000 OSD/BC V10.0A	4-254
MODIFY-PUBSET-CACHE-ATTRIBUTES	BS2000 OSD/BC V10.0A	4-340
MODIFY-PUBSET-DEFINITION-FILE	BS2000 OSD/BC V10.0A	4-349
MODIFY-PUBSET-PROCESSING	BS2000 OSD/BC V10.0A	4-355
MODIFY-PUBSET-RESTRICTIONS	BS2000 OSD/BC V10.0A	4-363
MODIFY-PUBSET-SPACE-DEFAULTS	BS2000 OSD/BC V10.0A	4-369
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MODIFY-SPACE-SATURATION-LEVELS	BS2000 OSD/BC V10.0A	4-402
MODIFY-STORAGE-CLASS	BS2000 OSD/BC V10.0A	4-413
MODIFY-SYSTEM-BIAS	BS2000 OSD/BC V10.0A	4-445
MODIFY-SYSTEM-PARAMETERS	BS2000 OSD/BC V10.0A	4-447
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Command	Component and version	Page
MOUNT-NET-STORAGE	BS2000 OSD/BC V10.0A	4-523
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MOVE-TASK-TO-CATEGORY	BS2000 OSD/BC V10.0A	4-552
PROTECT-FITC-APPLICATION	BS2000 OSD/BC V10.0A	5-95
REDUCE-PAGING-AREA	BS2000 OSD/BC V10.0A	5-107
RELEASE-OPERATOR-ROLE	BS2000 OSD/BC V10.0A	5-109
REMOVE-CE-LOCK	BS2000 OSD/BC V10.0A	5-119
REMOVE-CHANGE-DATE	BS2000 OSD/BC V10.0A	5-121
REMOVE-CONSOLE-FILTER	BS2000 OSD/BC V10.0A	5-124
REMOVE-CRYPTO-PASSWORD	BS2000 OSD/BC V10.0A	5-126
REMOVE-DEVICE-CONNECTION	BS2000 OSD/BC V10.0A	5-130
REMOVE-DEVICE-DEPOT	BS2000 OSD/BC V10.0A	5-136
REMOVE-FILE-ALLOCATION-LOCKS	BS2000 OSD/BC V10.0A	5-138
REMOVE-FILE-LINK	BS2000 OSD/BC V10.0A	5-142
REMOVE-IO-UNIT	BS2000 OSD/BC V10.0A	5-145
REMOVE-ISAM-POOL-LINK	BS2000 OSD/BC V10.0A	5-147
REMOVE-MASTER-CATALOG-ENTRY	BS2000 OSD/BC V10.0A	5-151
REMOVE-NET-STORAGE-VOLUME	BS2000 OSD/BC V10.0A	5-153
REMOVE-PASSWORD	BS2000 OSD/BC V10.0A	5-156
REMOVE-PUBSET-LOCK	BS2000 OSD/BC V10.0A	5-158
REPAIR-DISK-FILES	BS2000 OSD/BC V10.0A	5-169
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RESET-MSG-SUPPRESSION	BS2000 OSD/BC V10.0A	5-192
RESTORE-FILE-FROM-SNAPSET	BS2000 OSD/BC V10.0A	5-204
RESTORE-JV-FROM-SNAPSET	BS2000 OSD/BC V10.0A	5-213
RESTORE-PUBSET-FROM-SNAPSET	BS2000 OSD/BC V10.0A	5-219
RESUME-HARDWARE-AUDIT	BS2000 OSD/BC V10.0A	5-230
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RESUME-PUBSET-RECONFIGURATION	BS2000 OSD/BC V10.0A	5-248
RESUME-TASK	BS2000 OSD/BC V10.0A	5-253
RUN	BS2000 OSD/BC V10.0A	5-258
SECURE-RESOURCE-ALLOCATION	BS2000 OSD/BC V10.0A	5-273
SEND-MSG	BS2000 OSD/BC V10.0A	5-293
SET-CONSLOG-READ-MARK	BS2000 OSD/BC V10.0A	5-295
SET-DISK-DEFAULTS	BS2000 OSD/BC V10.0A	5-301
SET-DISK-PARAMETER	BS2000 OSD/BC V10.0A	5-303
SET-FILE-LINK	BS2000 OSD/BC V10.0A	5-311
SET-LOGON-PARAMETERS	BS2000 OSD/BC V10.0A	5-336
SET-MSG-SUPPRESSION	BS2000 OSD/BC V10.0A	5-347
SET-NET-CLIENT-ALTERNATE	BS2000 OSD/BC V10.0A	5-351
SET-PUBSET-ATTRIBUTES	BS2000 OSD/BC V10.0A	5-360
SET-RESTART-OPTIONS	BS2000 OSD/BC V10.0A	5-367
SET-SNAPSET-PARAMETER	BS2000 OSD/BC V10.0A	5-374
SET-SPACE-SATURATION-LEVEL	BS2000 OSD/BC V10.0A	5-377
SHOW-ACCOUNTING-STATUS	BS2000 OSD/BC V10.0A	5-389
SHOW-ADDRESS-SPACE-STATUS	BS2000 OSD/BC V10.0A	5-421
SHOW-AUDIT-STATUS	BS2000 OSD/BC V10.0A	5-438
SHOW-BLOCK-TO-FILE-ASSIGNMENT	BS2000 OSD/BC V10.0A	5-442
SHOW-CACHE-CONFIGURATION	BS2000 OSD/BC V10.0A	5-444
SHOW-CE-LOCK	BS2000 OSD/BC V10.0A	5-475
SHOW-CHANGE-DATES	BS2000 OSD/BC V10.0A	5-477
SHOW-CMD-ATTRIBUTES	BS2000 OSD/BC V10.0A	5-489
SHOW-CONSLOG-ATTRIBUTES	BS2000 OSD/BC V10.0A	5-494
SHOW-CONSOLE-FILTER	BS2000 OSD/BC V10.0A	5-496
SHOW-CONSOLE-OPTIONS	BS2000 OSD/BC V10.0A	5-500
SHOW-CONSOLE-STATUS	BS2000 OSD/BC V10.0A	5-502
SHOW-DEVICE-CONFIGURATION	BS2000 OSD/BC V10.0A	5-511
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Command	Component and version	Page
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SHOW-DISK-STATUS	BS2000 OSD/BC V10.0A	5-541
SHOW-FILE-ATTRIBUTES	BS2000 OSD/BC V10.0A	6-29
SHOW-FILE-LINK	BS2000 OSD/BC V10.0A	6-131
SHOW-FILE-LOCKS	BS2000 OSD/BC V10.0A	6-149
SHOW-HARDWARE-AUDIT	BS2000 OSD/BC V10.0A	6-188
SHOW-HEL-CHECK	BS2000 OSD/BC V10.0A	6-192
SHOW-HEL-LOGGING	BS2000 OSD/BC V10.0A	6-197
SHOW-HEL-STATUS	BS2000 OSD/BC V10.0A	6-201
SHOW-HEL-TELESERVICE-ALARM	BS2000 OSD/BC V10.0A	6-203
SHOW-INDEX-ATTRIBUTES	BS2000 OSD/BC V10.0A	6-204
SHOW-ISAM-CACHING	BS2000 OSD/BC V10.0A	6-221
SHOW-ISAM-POOL-ATTRIBUTES	BS2000 OSD/BC V10.0A	6-227
SHOW-ISAM-POOL-LINK	BS2000 OSD/BC V10.0A	6-233
SHOW-JOB-CLASS	BS2000 OSD/BC V10.0A	6-237
SHOW-JOB-OPTIONS	BS2000 OSD/BC V10.0A	6-244
SHOW-JOB-STREAM	BS2000 OSD/BC V10.0A	6-275
SHOW-JOB-SWITCHES	BS2000 OSD/BC V10.0A	6-278
SHOW-LINKAGE-AUDIT	BS2000 OSD/BC V10.0A	6-316
SHOW-MASTER-CATALOG-ENTRY	BS2000 OSD/BC V10.0A	6-325
SHOW-MEMORY-CONFIGURATION	BS2000 OSD/BC V10.0A	6-340
SHOW-MEMORY-POOL-STATUS	BS2000 OSD/BC V10.0A	6-344
SHOW-MOUNT-PARAMETER	BS2000 OSD/BC V10.0A	6-352
SHOW-MSG-OPTIONS	BS2000 OSD/BC V10.0A	6-360
SHOW-MSG-SUBSCRIPTION	BS2000 OSD/BC V10.0A	6-363
SHOW-MSG-SUPPRESSION	BS2000 OSD/BC V10.0A	6-365
SHOW-NET-CLIENT-ALTERNATE	BS2000 OSD/BC V10.0A	6-368
SHOW-NET-STORAGE	BS2000 OSD/BC V10.0A	6-372
SHOW-NET-STORAGE-OCCUPATION	BS2000 OSD/BC V10.0A	6-378
SHOW-PAGING-CONFIGURATION	BS2000 OSD/BC V10.0A	6-389
SHOW-PENDING-MSG	BS2000 OSD/BC V10.0A	6-395

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Command	Component and version	Page
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SHOW-PUBSET-CACHE-ATTRIBUTES	BS2000 OSD/BC V10.0A	6-467
SHOW-PUBSET-CATALOG-ALLOCATION	BS2000 OSD/BC V10.0A	6-482
SHOW-PUBSET-CONFIGURATION	BS2000 OSD/BC V10.0A	6-486
SHOW-PUBSET-DEFINITION-FILE	BS2000 OSD/BC V10.0A	6-498
SHOW-PUBSET-FILE-SERVICES	BS2000 OSD/BC V10.0A	6-505
SHOW-PUBSET-IMPORT-EXPORT	BS2000 OSD/BC V10.0A	6-516
SHOW-PUBSET-LOCKS	BS2000 OSD/BC V10.0A	6-520
SHOW-PUBSET-NET-STORAGE	BS2000 OSD/BC V10.0A	6-524
SHOW-PUBSET-OCCUPATION	BS2000 OSD/BC V10.0A	6-527
SHOW-PUBSET-PARAMETERS	BS2000 OSD/BC V10.0A	6-533
SHOW-PUBSET-PROCESSING	BS2000 OSD/BC V10.0A	6-563
SHOW-PUBSET-RESTRICTION	BS2000 OSD/BC V10.0A	6-568
SHOW-PUBSET-SPACE-ALLOCATION	BS2000 OSD/BC V10.0A	6-573
SHOW-PUBSET-SPACE-DEFAULTS	BS2000 OSD/BC V10.0A	6-581
SHOW-RESOURCE-ALLOCATION	BS2000 OSD/BC V10.0A	7-3
SHOW-RESOURCE-REQUESTS	BS2000 OSD/BC V10.0A	7-9
SHOW-RESTART-OPTIONS	BS2000 OSD/BC V10.0A	7-15
SHOW-SERSLOG-STATUS	BS2000 OSD/BC V10.0A	7-40
SHOW-SNAPSET-CONFIGURATION	BS2000 OSD/BC V10.0A	7-41
SHOW-SNAPSHOT-STATUS	BS2000 OSD/BC V10.0A	7-47
SHOW-SPACE-SATURATION-LEVELS	BS2000 OSD/BC V10.0A	7-50
SHOW-STORAGE-CLASS	BS2000 OSD/BC V10.0A	7-159
SHOW-SYSEVENT-LOG	BS2000 OSD/BC V10.0A	7-198
SHOW-SYSEVENT-LOG-ATTRIBUTES	BS2000 OSD/BC V10.0A	7-211
SHOW-SYSTEM-INFORMATION	BS2000 OSD/BC V10.0A	7-225
SHOW-SYSTEM-PARAMETERS	BS2000 OSD/BC V10.0A	7-239
SHOW-TAPE-STATUS	BS2000 OSD/BC V10.0A	7-261
SHOW-TRACE-STATUS	BS2000 OSD/BC V10.0A	7-289
SHOW-USER-SWITCHES	BS2000 OSD/BC V10.0A	7-371
SHOW-VOLUME-SET-LIST	BS2000 OSD/BC V10.0A	7-379
SHUTDOWN	BS2000 OSD/BC V10.0A	7-384

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Command	Component and version	Page
SKIP-COMMANDS	BS2000 OSD/BC V10.0A	7-391
START-ACCOUNTING	BS2000 OSD/BC V10.0A	7-395
START-CONFIGURATION-UPDATE	BS2000 OSD/BC V10.0A	7-403
START-FILE-CACHING	BS2000 OSD/BC V10.0A	7-423
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START-HEL-LOGGING	BS2000 OSD/BC V10.0A	7-431
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Tabelle 13: Versions of the commands (Part 16 of 18)

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EDIT-POSIX-USER-DEFAULTS	SRPMNUC V19.0A	3-208
EDIT-USER-ATTRIBUTES	SRPMNUC V19.0A	3-218
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HOLD-PROGRAM	SYSFILE V19.0A	3-408
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REMOVE-TASKLIB	SYSFILE V19.0A	5-166
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SET-JOB-STEP	SYSFILE V19.0A	5-331
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Tabelle 13: Versions of the commands (Part 18 of 18)

3.2 Overview of main functions of the BS2000 commands

The following tables show the commands collected in functional groups. Basically, the allocation of the commands to one of the functional groups is based on the assignments of the commands to the SDF domains.

However, in the present case, subfunctions were taken into account within individual groups and a number of commands have been assigned to various groups.

The following functional groups have been formed:

- Accounting system control
- AUDIT mode control
- Job processing
- Operator terminal control
- User management
- Caching media control
- File processing
- Data communication control
- Error logging
- Device management
- Global storage administration
- Job variables
- Editing command files
- Message processing
- Net-Storage administration
- Operator function control
- POSIX administration and application
- Program control
- Procedures
- Pubset and MRSCAT management
- SDF control
- Controlling spoolout job
- Subsystem management
- System control and optimization

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3.3 Domains

The commands are assigned to application areas known as domains according to their function. A command can be contained in more than one domain. An overview of all domains can be displayed in the SDF user interface and the desired command can be selected by way of the domain. Domains containing commands for the user are not displayed.

Overview of domains

Domain	Meaning
ACCOUNTING	Outputs information about the user ID and inserts data into accounting records
ALL-COMMANDS ¹	Contains all the commands that are allocated to an domain
AUTOMATED-OPERATING	Commands for automating operator tasks
CONSOLE-MANAGEMENT	Console control and management
DATA-BASE	Database management and administration
DCAM	Controls transaction mode (DCAM)
DEVICE	Outputs information on devices and volumes
ERROR-LOGGING	Manages error logging files (hardware and software errors)
FILE	Manages files
FILE-GENERATION-GROUP	Manages file generation groups
FILE-TRANSFER	Transfers files between systems via network connections
JOB	Job control
JOB-VARIABLES	Manages job variables
MESSAGE-PROCESSING	Manages message files
MULTI-CATALOG-AND-PUBSET-MGMT ²	Controls file access in the local BS2000 computer network and handles pubset management
NETWORK-MANAGEMENT	Manages networking functionality
PREVENTIVE-DIAGNOSTIC-SUPPORT	Supports diagnostic aids
PROCEDURE	Controls command procedures
PROGRAM	Controls program runs
PROGRAMMING-SUPPORT	Calls compilers and programming tools
SDF	Commands for managing the SDF interface

Table 14: Overview of domains (Part 1 of 2)

Domain	Meaning
SECURITY-ADMINISTRATION	Manages access authorizations and auditing
SNAPSET	Manages Snapsets, data backup and restoration
SPOOL-PRINT-ADMINISTRATION ³	Manages spool and print resources
SPOOL-PRINT-SERVICES ⁴	Spool and print functions for all users
STORAGE-MANAGEMENT	Manages external storages
SYSTEM-MANAGEMENT ⁵	Dynamic control of subsystem configuration
SYSTEM-TUNING	System monitoring and optimization
USER-ADMINISTRATION	User administration
UTILITIES	Calls utility routines
VM2000-VIRTUAL-MACHINE	Manages the virtual machine system

Table 14: Overview of domains (Part 2 of 2)

¹ The domain includes all the commands that can be entered in dialog mode.

² The domain is a long-term replacement for the MULTI-CATALOG domain.

³ The domain is a long-term replacement for the RSO-SPOOL-ADMINISTRATION domain.

⁴ The domain is a long-term replacement for the SPOOL domain.

⁵ The domain is a long-term replacement for the SUBSYSTEM-MANAGEMENT domain.

Domains and the associated commands

The following overview groups the commands that are described in this manual under the domains to which they are allocated. Domains which do not contain any of the commands described in the manual are not listed.

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START-ACCOUNTING [7-395](#)
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CONSOLE-MANAGEMENT

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ASSIGN-SYSEVENT [2-173](#)
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3.4 Commands and their privileges

The table below contains all the commands which are described in this manual.

The last two columns show the routing code (RC) of the operator commands in accordance with the system parameter NBCONOPI (see the “Introduction to System Administration” [14]).

Command	Privileges																
	ACS-ADMINISTRATION	HARDWARE-MAINT.	HSMS-ADMIN.	POSIX-ADMIN.	PRINT-SERVICE-ADMIN.	SAT-FILE-EVALUATION	SAT-FILE-MANAG.	SECURITY-ADMIN.	STD-PROCESSING	SUBSYSTEM-MANAG.	SW-MONITOR-ADMIN.	TAPE-ADMIN.	TSOS	USER-ADMIN.	OPERATING	BS with NBCONOPI=N	BS with NBCONOPI=Y
ACTIVATE-SNAPSHOT													X		X	R	R
ADAPT-SNAPSET-ACCESS			X										X				
ADD-ACS-SYSTEM-FILE	X																
ADD-ALIAS-CATALOG-ENTRY	X					X	X	X	X								
ADD-ASE-ELEMENT													X				
ADD-CATALOG-FILE													X				
ADD-CHANGE-DATE													X				
ADD-CJC-ACTION		X				X	X	X	X								
ADD-CONSOLE-FILTER														X	@	@	
ADD-CRYPTO-PASSWORD		X				X	X	X	X								
ADD-DEVICE-DEPOT														X	T	T	
ADD-FILE-LINK		X				X	X		X							\$	E
ADD-IO-UNIT														X	G	G	
ADD-ISAM-POOL-LINK									X								
ADD-MASTER-CATALOG-ENTRY													X			\$	\$
ADD-NET-STORAGE-VOLUME													X				
ADD-PASSWORD		X				X	X	X	X							\$	E
ADD-POSIX-USER													X	X			
ADD-SUBSYSTEM										X							
ADD-USER								X						X		\$	\$
AGOGO														X	E	E	E

Tabelle 15: Commands with privileges

(Part 1 of 21)

Command	Privileges												BS with NBCONOPI=N	BS with NBCONOPI=Y		
	ACS-ADMINISTRATION	HARDWARE-MAINT.	HSMS-ADMIN.	POSIX-ADMIN.	PRINT-SERVICE-ADMIN.	SAT-FILE-EVALUATION	SAT-FILE-MANAG.	SECURITY-ADMIN.	STD-PROCESSING	SUBSYSTEM-MANAG.	SW-MONITOR-ADMIN.	TAPE-ADMIN.			TSOS	USER-ADMIN.
ASR														X	E	E
ASSIGN-STREAM		X				X	X	X	X					X		
ASSIGN-SYSDTA		X				X	X	X	X							
ASSIGN-SYSEVENT									X					X		
ASSIGN-SYSLST		X				X	X	X	X							
ASSIGN-SYSOUT		X				X	X	X	X							
ASTOP														X	@	@
ATTACH-DEVICE														X	G	G
ATTACH-GS-UNIT												X				
BEGIN-PARAMETER-DECLARATION		X				X	X	X	X					X		
BEGIN-PROCEDURE		X				X	X	X	X							
BROADCAST												X		X	E	E
CALL-PROCEDURE		X				X	X	X	X					X		
CANCEL-CCOPY-SESSION			X									X				
CANCEL-JOB		X				X	X	X	X					X	P	P
CANCEL-PRINT-JOB					X	X	X	X	X					X		
CANCEL-PROCEDURE		X				X	X	X	X							
CANCEL-PROGRAM		X				X	X	X	X							
CANCEL-PUBSET-EXPORT												X		X	R	R
CANCEL-PUBSET-IMPORT												X		X	R	R
CANCEL-RUN-PROCESS														X	E	E
CHANGE-ACCOUNTING-FILE												X				
CHANGE-CONSLOG-FILE							X					X		X	R	R
CHANGE-DISK-MOUNT														X	D	D
CHANGE-FILE-LINK						X	X		X							
CHANGE-HEL-FILE		X														
CHANGE-RESLOG-FILE										X		X				
CHANGE-SERSLOG-FILE										X		X			A	A

Tabelle 15: Commands with privileges

(Part 2 of 21)

Command	Privileges												BS with NBCONOPI=N	BS with NBCONOPI=Y			
	ACS-ADMINISTRATION	HARDWARE-MAINT.	HSMS-ADMIN.	POSIX-ADMIN.	PRINT-SERVICE-ADMIN.	SAT-FILE-EVALUATION	SAT-FILE-MANAG.	SECURITY-ADMIN.	STD-PROCESSING	SUBSYSTEM-MANAG.	SW-MONITOR-ADMIN.	TAPE-ADMIN.			TSOS	USER-ADMIN.	OPERATING
CHANGE-STORAGE-CLASS-CATALOG													X				
CHANGE-TAPE-MOUNT															X	T	T
CHANGE-TASK-CPU-LIMIT													X	X	P	P	
CHANGE-TASK-PRIORITY						X	X	X	X						X	P	P
CHANGE-VOLUME-SET-LIST-CATALOG													X				
CHECK-DISK-MOUNT															X	D	D
CHECK-FILE-CONSISTENCY									X								
CHECK-IMPORT-DISK-FILE									X				X				
CHECK-PUBSET-MIRRORS													X				
CHECK-SNAPSET-CONFIGURATION			X										X				
CHECK-TAPE-MOUNT															X	T	T
CLOSE-VARIABLE-CONTAINER		X				X	X	X	X						X		
CLOSE-VIRTUAL-DEVICE-DIALOG					X				X								
COMPARE-DISK-FILES		X				X	X		X				X				
CONCATENATE-DISK-FILES									X				X				
CONNECT-CMD-SERVER															X	K	K
CONNECT-GS-SERVER													X				
CONSOLE															X	*	1
CONVERT-FILE-TO-PDF									X								
COPY-FILE		X				X	X	X	X				X			\$	\$
COPY-GS-PARTITION													X				
COPY-JV		X				X	X	X	X								
COPY-POSIX-FILE	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
COPY-SYSTEM-FILE		X				X	X	X	X								
CREATE-ALTERNATE-INDEX									X								
CREATE-DUMP	X		X	X	X	X	X	X	X	X	X	X	X	X			
CREATE-FILE						X	X	X	X				X			\$	E
CREATE-FILE-GENERATION									X				X			\$	E

Tabelle 15: Commands with privileges

Command	Privileges												BS with NBCONOPI=N	BS with NBCONOPI=Y		
	ACS-ADMINISTRATION	HARDWARE-MAINT.	HSMS-ADMIN.	POSIX-ADMIN.	PRINT-SERVICE-ADMIN.	SAT-FILE-EVALUATION	SAT-FILE-MANAG.	SECURITY-ADMIN.	STD-PROCESSING	SUBSYSTEM-MANAG.	SW-MONITOR-ADMIN.	TAPE-ADMIN.			TSOS	USER-ADMIN.
CREATE-FILE-GROUP								X				X			€	E
CREATE-GS-COMPLEX												X				
CREATE-GS-PARTITION												X				
CREATE-GS-VOLUME												X				
CREATE-ISAM-POOL								X								
CREATE-JV		X				X	X	X	X						\$	J
CREATE-OPERATOR-ROLE								X								
CREATE-PAGING-FILE												X		X	R	R
CREATE-SNAPSET			X									X				
CREATE-STORAGE-CLASS												X				
CREATE-TAPE-SET									X						\$	E
CREATE-VOLUME-SET-LIST												X				
DEACTIVATE-SNAPSHOT												X		X	R	R
DECLARE-PARAMETER		X				X	X	X	X					X		
DECLARE-VARIABLE		X				X	X	X	X					X		
DECRYPT-FILE						X	X		X			X				
DELETE-ALTERNATE-INDEX									X							
DELETE-FILE						X	X	X	X			X			\$	E
DELETE-FILE-GENERATION		X							X			X			\$	E
DELETE-FILE-GROUP		X							X			X			\$	E
DELETE-GS-PARTITION												X				
DELETE-GS-VOLUME												X				
DELETE-ISAM-POOL									X							
DELETE-JV		X				X	X	X	X			X			€	J
DELETE-OPERATOR-ROLE									X							
DELETE-PAGING-FILE												X		X	R	R
DELETE-SNAPSET			X									X				
DELETE-STORAGE-CLASS												X				

Tabelle 15: Commands with privileges

(Part 4 of 21)

Command	Privileges													BS with NBCONOPI=N	BS with NBCONOPI=Y		
	ACS-ADMINISTRATION	HARDWARE-MAINT.	HSMS-ADMIN.	POSIX-ADMIN.	PRINT-SERVICE-ADMIN.	SAT-FILE-EVALUATION	SAT-FILE-MANAG.	SECURITY-ADMIN.	STD-PROCESSING	SUBSYSTEM-MANAG.	SW-MONITOR-ADMIN.	TAPE-ADMIN.	TSOS			USER-ADMIN.	OPERATING
DELETE-SYSTEM-FILE		X				X	X	X	X							€	€
DELETE-TAPE-SET									X							€	€
DELETE-VARIABLE		X				X	X	X	X					X			
DELETE-VOLUME-SET-LIST													X				
DETACH-DEVICE														X	G	G	
DETACH-GS-UNIT													X				
DISCONNECT-CMD-SERVER														X	@	@	
DISCONNECT-GS-SERVER													X				
EDIT-FILE-ATTRIBUTES									X								
EDIT-FILE-GENERATION-SUPPORT									X								
EDIT-FILE-GROUP-ATTRIBUTES									X								
EDIT-FILE-LINK									X								
EDIT-JOB						X	X	X	X					X			
EDIT-JOB-OPTIONS		X				X	X	X	X				X	X			
EDIT-JV		X				X	X	X	X					X			
EDIT-JV-ATTRIBUTES		X				X	X	X	X								
EDIT-MASTER-CATALOG-ENTRY													X				
EDIT-POSIX-USER-ATTRIBUTES				X					X					X			
EDIT-POSIX-USER-DEFAULTS				X					X					X			
EDIT-PUBSET-CACHE-ATTRIBUTES													X				
EDIT-PUBSET-DEFINITION-FILE													X				
EDIT-PUBSET-SPACE-DEFAULTS													X				
EDIT-SPACE-SATURATION-LEVELS													X				
EDIT-STORAGE-CLASS													X				
EDIT-USER-ATTRIBUTES									X					X			
EDIT-USER-PUBSET-ATTRIBUTES									X					X			
ELSE		X				X	X	X	X					X			
ENCRYPT-FILE						X	X		X				X				

Tabelle 15: Commands with privileges

Command	Privileges													BS with NBCONOPI=N	BS with NBCONOPI=Y		
	ACS-ADMINISTRATION	HARDWARE-MAINT.	HSMS-ADMIN.	POSIX-ADMIN.	PRINT-SERVICE-ADMIN.	SAT-FILE-EVALUATION	SAT-FILE-MANAG.	SECURITY-ADMIN.	STD-PROCESSING	SUBSYSTEM-MANAG.	SW-MONITOR-ADMIN.	TAPE-ADMIN.	TSOS			USER-ADMIN.	OPERATING
END-CJC-ACTION		X				X	X	X	X								
END-IF		X				X	X	X	X						X		
END-PARAMETER-DECLARATION		X				X	X	X	X						X		
END-PROCEDURE		X				X	X	X	X								
ENDP-RESUME						X	X	X	X								
ENTER-JOB		X				X	X	X	X						X	P	P
ENTER-PROCEDURE		X							X								
EOF						X	X	X	X								
EXECUTE-POSIX-CMD									X								
EXIT-JOB	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2	@
EXIT-PROCEDURE		X				X	X	X	X						X		
EXPORT-FILE						X	X	X	X				X			\$	E
EXPORT-NODE-FILE						X	X	X	X				X			\$	E
EXPORT-PUBSET													X	X	R	R	
EXTEND-PAGING-AREA													X	X	R	R	
EXTEND-TAPE-SET									X							\$	E
FORCE-DESTROY-CACHE													X				
FORCE-DESTROY-GS-PARTITION													X				
FORCE-JOB-CANCEL													X	X	P	P	
FORCE-PUBSET-EXPORT													X	X	R	R	
GET-JOB-FROM-VIRTUAL-DEVICE					X				X								
GOTO		X				X	X	X	X						X		
HELP-MSG-INFORMATION		X				X	X	X	X				X	X	@	@	
HELP-SDF		X				X	X	X	X								
HOLD-ALIAS-SUBSTITUTION						X	X	X	X								
HOLD-HARDWARE-AUDIT									X				X				
HOLD-JOB													X	X	J	J	
HOLD-JOB-CLASS													X	X	J	J	

Tabelle 15: Commands with privileges

(Part 6 of 21)

Command	Privileges																
	ACS-ADMINISTRATION	HARDWARE-MAINT.	HSMS-ADMIN.	POSIX-ADMIN.	PRINT-SERVICE-ADMIN.	SAT-FILE-EVALUATION	SAT-FILE-MANAG.	SECURITY-ADMIN.	STD-PROCESSING	SUBSYSTEM-MANAG.	SW-MONITOR-ADMIN.	TAPE-ADMIN.	TSOS	USER-ADMIN.	OPERATING	BS with NBCONOPI=N	BS with NBCONOPI=Y
HOLD-JOB-STREAM													X		X	J	J
HOLD-LINKAGE-AUDIT								X					X				
HOLD-PRINT-JOB					X	X	X	X	X						X	O	O
HOLD-PROCEDURE		X				X	X	X	X								
HOLD-PROGRAM						X	X	X	X								
HOLD-SUBSYSTEM										X					X	R	R
HOLD-TASK													X		X	J	J
IF		X				X	X	X	X								
IF-BLOCK-ERROR		X				X	X	X	X						X		
IMPORT-FILE						X	X		X				X			\$	E
IMPORT-NODE-FILE						X	X	X	X				X			\$	E
IMPORT-PUBSET													X		X	R	R
INCLUDE-DEVICE-CONNECTION															X	G	G
INFORM-ALL-JOBS													X		X	E	E
INFORM-JOB													X		X	E	E
INFORM-OPERATOR		X				X	X	X	X								
INFORM-PROGRAM		X				X	X	X	X				X		X	P	P
LIST-CATALOG-ENTRY													X				
LIST-FILE-FROM-SNAPSET									X				X				
LIST-JV-FROM-SNAPSET									X				X				
LIST-NET-DIRECTORIES													X		X	G	G
LIST-NODE-FILES		X				X	X	X	X							@	@
LOAD-ALIAS-CATALOG						X	X	X	X								
LOAD-EXECUTABLE-PROGRAM						X	X	X	X								
LOAD-PROGRAM						X	X	X	X								
LOCK-FILE-LINK						X	X		X								
LOCK-PRODUCT-VERSION										X							
LOCK-USER									X					X		\$	\$

Tabelle 15: Commands with privileges

Command	Privileges													BS with NBCONOPI=N	BS with NBCONOPI=Y	
	ACS-ADMINISTRATION	HARDWARE-MAINT.	HSMS-ADMIN.	POSIX-ADMIN.	PRINT-SERVICE-ADMIN.	SAT-FILE-EVALUATION	SAT-FILE-MANAG.	SECURITY-ADMIN.	STD-PROCESSING	SUBSYSTEM-MANAG.	SW-MONITOR-ADMIN.	TAPE-ADMIN.	TSOS			USER-ADMIN.
LOGOFF	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
MAIL-FILE		X				X	X	X	X				X			
MESSAGE														X	E	E
MODIFY-ACCOUNTING-PARAMETERS													X			
MODIFY-ACS-OPTIONS	X					X	X	X	X							
MODIFY-ACS-SYSTEM-FILE	X															
MODIFY-ALIAS-CATALOG-ENTRY	X					X	X	X	X							
MODIFY-ASE-PARAMETERS													X			
MODIFY-CHANGE-DATES													X			
MODIFY-CONSOLE-OPTIONS														X	@	@
MODIFY-DBL-DEFAULTS									X							
MODIFY-DEFAULT-ACCOUNT		X				X	X	X	X					X		
MODIFY-FILE-ATTRIBUTES						X	X	X	X				X		\$	E
MODIFY-FILE-GENERATION-SUPPORT									X				X		\$	E
MODIFY-FILE-GROUP-ATTRIBUTES									X				X		\$	E
MODIFY-GS-COMPLEX													X			
MODIFY-GSMAN-PARAMETERS													X			
MODIFY-HEL-CHECK		X														
MODIFY-HEL-LOGGING		X														
MODIFY-HEL-TELESERVICE-ALARM		X														
MODIFY-IMON-SCI										X						
MODIFY-IO-UNIT														X	G	G
MODIFY-ISAM-CACHING													X			
MODIFY-JOB						X	X	X	X					X	J	J
MODIFY-JOB-CLASS													X	X	J	J
MODIFY-JOB-OPTIONS		X				X	X	X	X				X	X		
MODIFY-JOB-STREAM													X	X	J	J
MODIFY-JOB-SWITCHES		X				X	X	X	X							

Tabelle 15: Commands with privileges

Command	Privileges												BS with NBCONOPI=N	BS with NBCONOPI=Y			
	ACS-ADMINISTRATION	HARDWARE-MAINT.	HSMS-ADMIN.	POSIX-ADMIN.	PRINT-SERVICE-ADMIN.	SAT-FILE-EVALUATION	SAT-FILE-MANAG.	SECURITY-ADMIN.	STD-PROCESSING	SUBSYSTEM-MANAG.	SW-MONITOR-ADMIN.	TAPE-ADMIN.			TSOS	USER-ADMIN.	OPERATING
MODIFY-JV		X				X	X	X	X						X	J	J
MODIFY-JV-ATTRIBUTES		X				X	X	X	X							\$	J
MODIFY-JV-CONDITIONALLY		X				X	X	X	X								
MODIFY-MASTER-CATALOG-ENTRY													X			\$	\$
MODIFY-MEMORY-PARAMETERS												X		X		R	R
MODIFY-MIP-OPTIONS												X					
MODIFY-MIP-PARAMETERS												X					
MODIFY-MONJV		X				X	X	X	X								
MODIFY-MOUNT-PARAMETER														X		G	G
MODIFY-MSG-ATTRIBUTES						X	X	X	X			X					
MODIFY-MSG-FILE-ASSIGNMENT						X	X	X	X			X		X		E	E
MODIFY-MSG-OPTIONS		X				X	X	X	X								
MODIFY-MSG-SUBSCRIPTION														X		E	E
MODIFY-OPERATOR-ATTRIBUTES									X								
MODIFY-OPERATOR-ROLE									X								
MODIFY-PAGING-AREA-ATTRIBUTES												X		X		R	R
MODIFY-POSIX-USER-ATTRIBUTES				X					X				X				
MODIFY-POSIX-USER-DEFAULTS				X					X				X				
MODIFY-PRINT-JOB-ATTRIBUTES					X	X	X	X	X					X			
MODIFY-PRINTER-OUTPUT-STATUS					X	X	X	X	X					X		S	S
MODIFY-PROCEDURE-OPTIONS		X				X	X	X	X					X			
MODIFY-PUBSET-CACHE-ATTRIBUTES												X					
MODIFY-PUBSET-DEFINITION-FILE												X					
MODIFY-PUBSET-PROCESSING												X					
MODIFY-PUBSET-RESTRICTIONS												X					
MODIFY-PUBSET-SPACE-DEFAULTS												X					
MODIFY-PUBSET-SPACEPRO-OPTIONS												X					
MODIFY-RESOURCE-COLLECTION														X	J	J	J

Tabelle 15: Commands with privileges

Command	Privileges													BS with NBCONOPI=N	BS with NBCONOPI=Y		
	ACS-ADMINISTRATION	HARDWARE-MAINT.	HSMS-ADMIN.	POSIX-ADMIN.	PRINT-SERVICE-ADMIN.	SAT-FILE-EVALUATION	SAT-FILE-MANAG.	SECURITY-ADMIN.	STD-PROCESSING	SUBSYSTEM-MANAG.	SW-MONITOR-ADMIN.	TAPE-ADMIN.	TSOS			USER-ADMIN.	OPERATING
MODIFY-SDF-OPTIONS		X				X	X	X	X				X				
MODIFY-SDF-PARAMETERS													X			*	*
MODIFY-SPACE-SATURATION-LEVELS													X			\$	\$
MODIFY-SPACEPRO-PARAMETERS													X				
MODIFY-SPOOLOUT-OPTIONS					X	X	X	X	X								
MODIFY-STORAGE-CLASS													X				
MODIFY-SUBSYSTEM-PARAMETER										X							
MODIFY-SYSFILE-OPTIONS									X								
MODIFY-SYSTEM-BIAS													X	X	R	R	
MODIFY-SYSTEM-PARAMETERS													X				
MODIFY-TAPE-OUTPUT-STATUS					X									X	S	S	
MODIFY-TASK-CATEGORIES													X	X	R	R	
MODIFY-TERMINAL-OPTIONS		X				X	X	X	X				X				
MODIFY-TEST-OPTIONS	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
MODIFY-USER-ATTRIBUTES									X				X		\$	\$	
MODIFY-USER-PROTECTION		X				X	X	X	X					X	@	@	
MODIFY-USER-PUBSET-ATTRIBUTES									X				X		\$	\$	
MODIFY-USER-SWITCHES		X				X	X	X	X								
MODIFY-VOLUME-SET-LIST													X				
MOUNT-NET-STORAGE													X	X	G	G	
MOVE-JOBS													X				
MOVE-PRINT-JOBS					X												
MOVE-SPACEPRO-DISK													X				
MOVE-TASK-TO-CATEGORY													X				
OPEN-VARIABLE-CONTAINER		X				X	X	X	X					X			
OPEN-VIRTUAL-DEVICE-DIALOG					X				X								
PRINT-DOCUMENT		X				X	X	X	X						\$	\$	
PROTECT-FITC-APPLICATION	X		X	X	X	X	X	X	X	X	X	X	X	X			

Tabelle 15: Commands with privileges

Command	Privileges												BS with NBCONOPI=N	BS with NBCONOPI=Y			
	ACS-ADMINISTRATION	HARDWARE-MAINT.	HSMS-ADMIN.	POSIX-ADMIN.	PRINT-SERVICE-ADMIN.	SAT-FILE-EVALUATION	SAT-FILE-MANAG.	SECURITY-ADMIN.	STD-PROCESSING	SUBSYSTEM-MANAG.	SW-MONITOR-ADMIN.	TAPE-ADMIN.			TSOS	USER-ADMIN.	OPERATING
PURGE-ALIAS-CATALOG						X	X	X	X								
READ-IOCF												X					
REDIRECT-PRINT-JOB					X	X	X	X	X					X	N	N	
REDUCE-PAGING-AREA												X	X	R	R		
RELEASE-OPERATOR-ROLE														X	@	@	
RELEASE-SUBSYSTEM-SPACE		X						X	X								
REMARK		X				X	X	X	X					X	@	@	
REMOVE-ACS-SYSTEM-FILE	X																
REMOVE-ALIAS-CATALOG-ENTRY						X	X	X	X								
REMOVE-ASE-ELEMENT												X					
REMOVE-CE-LOCK												X					
REMOVE-CHANGE-DATE												X					
REMOVE-CJC-ACTION		X				X	X	X	X								
REMOVE-CONSOLE-FILTER														X	@	@	
REMOVE-CRYPTO-PASSWORD		X				X	X	X	X								
REMOVE-DCAM-APPLICATION-LINK		X							X								
REMOVE-DCAM-CONNECTION-LINK									X								
REMOVE-DEVICE-CONNECTION														X	G	G	
REMOVE-DEVICE-DEPOT														X	T	T	
REMOVE-FILE-ALLOCATION-LOCKS						X	X	X	X			X					
REMOVE-FILE-LINK		X				X	X		X								
REMOVE-IO-UNIT														X	G	G	
REMOVE-ISAM-POOL-LINK									X								
REMOVE-JV-LINK		X				X	X	X	X						\$	J	
REMOVE-MASTER-CATALOG-ENTRY												X			\$	\$	
REMOVE-NET-STORAGE-VOLUME												X					
REMOVE-PASSWORD		X				X	X	X	X						\$	E	
REMOVE-PUBSET-LOCK												X					

Tabelle 15: Commands with privileges

Command	Privileges												BS with NBCONOPI=N	BS with NBCONOPI=Y			
	ACS-ADMINISTRATION	HARDWARE-MAINT.	HSMS-ADMIN.	POSIX-ADMIN.	PRINT-SERVICE-ADMIN.	SAT-FILE-EVALUATION	SAT-FILE-MANAG.	SECURITY-ADMIN.	STD-PROCESSING	SUBSYSTEM-MANAG.	SW-MONITOR-ADMIN.	TAPE-ADMIN.			TSOS	USER-ADMIN.	OPERATING
REMOVE-RFA-CONNECTION						X	X		X								
REMOVE-SUBSYSTEM										X							
REMOVE-TASKLIB		X							X								
REMOVE-USER									X				X			Ⓢ	Ⓢ
REPAIR-DISK-FILES						X	X	X	X								
REPAIR-FILE-LOCKS									X				X				
REQUEST-MAIN-CONSOLE-FUNCTIONS														X		E	E
REQUEST-OPERATOR-ROLE														X		@	@
RESET-DBL-DEFAULTS									X								
RESET-INPUT-DEFAULTS		X				X	X	X	X								
RESET-MSG-BUFFER														X		@	@
RESET-MSG-SUPPRESSION														X		@	@
RESTART-PROGRAM							X	X	X								
RESTORE-FILE-FROM-SNAPSET									X				X				
RESTORE-JV-FROM-SNAPSET									X				X				
RESTORE-PUBSET-FROM-SNAPSET			X										X				
RESTORE-SDF-INPUT		X				X	X	X	X								
RESTORE-SOFTWARE-INVENTORY										X							
RESUME-ALIAS-SUBSTITUTION						X	X	X	X								
RESUME-HARDWARE-AUDIT									X				X				
RESUME-JOB													X	X	J	J	
RESUME-JOB-CLASS													X	X	J	J	
RESUME-JOB-STREAM													X	X	J	J	
RESUME-LINKAGE-AUDIT									X				X				
RESUME-PRINT-JOB					X	X	X	X	X					X		O	O
RESUME-PROCEDURE		X				X	X	X	X								
RESUME-PROGRAM	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
RESUME-PUBSET-RECONFIGURATION													X				

Tabelle 15: Commands with privileges

Command	Privileges												BS with NBCONOPI=N	BS with NBCONOPI=Y			
	ACS-ADMINISTRATION	HARDWARE-MAINT.	HSMS-ADMIN.	POSIX-ADMIN.	PRINT-SERVICE-ADMIN.	SAT-FILE-EVALUATION	SAT-FILE-MANAG.	SECURITY-ADMIN.	STD-PROCESSING	SUBSYSTEM-MANAG.	SW-MONITOR-ADMIN.	TAPE-ADMIN.			TSOS	USER-ADMIN.	OPERATING
RESUME-SUBSYSTEM										X					X	R	R
RESUME-TASK												X			X	J	J
RETURN-JOB-TO-VIRTUAL-DEVICE					X				X								
RUN															X	E	E
SAVE-RETURNCODE		X				X	X	X	X						X		
SAVE-SOFTWARE-INVENTORY										X							
SAVE-SUBSYSTEM-CATALOG										X							
SAVE-VARIABLE-CONTAINER		X				X	X	X	X						X		
SECURE-RESOURCE-ALLOCATION		X				X	X		X								
SELECT-PRODUCT-VERSION									X	X							
SELECT-PROGRAM-VERSION									X								
SEND-MSG		X				X	X	X	X				X		X	P	P
SET-CONSLOG-READ-MARK							X						X				
SET-DCAM-APPLICATION-LINK		X							X								
SET-DCAM-CONNECTION-LINK									X								
SET-DISK-DEFAULTS															X	D	D
SET-DISK-PARAMETER															X	D	D
SET-DSSM-OPTIONS										X					X	R	R
SET-FILE-LINK		X				X	X		X							\$	E
SET-FILE-NAME-PREFIX						X	X	X	X								
SET-INSTALLATION-PATH										X							
SET-JOB-STEP		X				X	X	X	X								
SET-JV-LINK		X				X	X	X	X							\$	J
SET-LOGON-PARAMETERS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1	@
SET-MSG-SUPPRESSION															X	@	@
SET-NET-CLIENT-ALTERNATE												X			X	G	G
SET-PROCEDURE-OPTIONS		X				X	X	X	X						X		
SET-PUBSET-ATTRIBUTES												X					

Tabelle 15: Commands with privileges

Command	Privileges												BS with NBCONOPI=N	BS with NBCONOPI=Y			
	ACS-ADMINISTRATION	HARDWARE-MAINT.	HSMS-ADMIN.	POSIX-ADMIN.	PRINT-SERVICE-ADMIN.	SAT-FILE-EVALUATION	SAT-FILE-MANAG.	SECURITY-ADMIN.	STD-PROCESSING	SUBSYSTEM-MANAG.	SW-MONITOR-ADMIN.	TAPE-ADMIN.			TSOS	USER-ADMIN.	OPERATING
SET-REPROG-READ-MARK						X							X				
SET-RESTART-OPTIONS														X	R	R	
SET-RFA-CONNECTION						X	X		X								
SET-SNAPSET-PARAMETERS			X										X				
SET-SPACE-SATURATION-LEVEL													X				
SET-SYSLST-READ-MARK		X				X	X	X	X								
SET-SYSOUT-READ-MARK		X				X	X	X	X								
SET-TASKLIB		X							X								
SET-VARIABLE		X				X	X	X	X					X			
SHOW-ACCOUNTING-STATUS													X				
SHOW-ACS-OPTIONS	X					X	X	X	X								
SHOW-ACS-SYSTEM-FILES						X	X	X	X								
SHOW-ACTIVE-SPOOL-DEVICES					X	X	X	X	X					X	S	S	
SHOW-ADDRESS-SPACE-STATUS									X	X			X				
SHOW-ALIAS-CATALOG-ENTRY						X	X	X	X								
SHOW-ASE-ELEMENT													X				
SHOW-ASE-LOGGING													X				
SHOW-ASE-PARAMETERS													X				
SHOW-ASE-STATUS													X				
SHOW-AUDIT-STATUS													X				
SHOW-BLOCK-TO-FILE-ASSIGNMENT													X				
SHOW-CACHE-CONFIGURATION		X									X		X				
SHOW-CALENDAR									X								
SHOW-CCOPY-SESSION			X										X				
SHOW-CE-LOCK									X				X				
SHOW-CHANGE-DATES													X				
SHOW-CJC-STATUS		X				X	X	X	X					X	E	E	
SHOW-CMD		X				X	X	X	X								

Tabelle 15: Commands with privileges

Command	Privileges												BS with NBCONOPI=N	BS with NBCONOPI=Y		
	ACS-ADMINISTRATION	HARDWARE-MAINT.	HSMS-ADMIN.	POSIX-ADMIN.	PRINT-SERVICE-ADMIN.	SAT-FILE-EVALUATION	SAT-FILE-MANAG.	SECURITY-ADMIN.	STD-PROCESSING	SUBSYSTEM-MANAG.	SW-MONITOR-ADMIN.	TAPE-ADMIN.			TSOS	USER-ADMIN.
SHOW-CMD-ATTRIBUTES														X	@	@
SHOW-CONSLOG-ATTRIBUTES						X						X		X	@	@
SHOW-CONSOLE-FILTER														X	@	@
SHOW-CONSOLE-OPTIONS														X	@	@
SHOW-CONSOLE-STATUS														X	@	@
SHOW-DBL-DEFAULTS								X								
SHOW-DEVICE-CONFIGURATION		X						X		X				X	E	E
SHOW-DEVICE-DEPOT		X						X						X	E	E
SHOW-DEVICE-STATUS		X			X	X		X		X	X			X	E	E
SHOW-DISK-DEFAULTS		X						X		X				X	E	E
SHOW-DISK-STATUS		X						X		X				X	E	E
SHOW-DSSM-INFORMATION									X							
SHOW-FILE		X				X	X	X	X							
SHOW-FILE-ATTRIBUTES		X				X	X	X	X						@	@
SHOW-FILE-LINK		X				X	X		X							
SHOW-FILE-LOCKS								X				X				
SHOW-FILE-NAME-PREFIX						X	X	X	X							
SHOW-GCF-CATALOGS												X				
SHOW-GCF-OBJECT-TYPES												X				
SHOW-GCF-SERVER-TASKS												X				
SHOW-GS-COMPLEX-CONFIGURATION										X		X		X	@	@
SHOW-GS-STATUS										X		X		X	@	@
SHOW-GS-VOLUME-ATTRIBUTES									X			X		X	@	@
SHOW-HARDWARE-AUDIT								X				X				
SHOW-HEL-CHECK		X														
SHOW-HEL-LOGGING		X														
SHOW-HEL-STATUS		X										X				
SHOW-HEL-TELESERVICE-ALARM		X														

Tabelle 15: Commands with privileges

Command	Privileges												BS with NBCONOPI=N	BS with NBCONOPI=Y			
	ACS-ADMINISTRATION	HARDWARE-MAINT.	HSMS-ADMIN.	POSIX-ADMIN.	PRINT-SERVICE-ADMIN.	SAT-FILE-EVALUATION	SAT-FILE-MANAG.	SECURITY-ADMIN.	STD-PROCESSING	SUBSYSTEM-MANAG.	SW-MONITOR-ADMIN.	TAPE-ADMIN.			TSOS	USER-ADMIN.	OPERATING
SHOW-INDEX-ATTRIBUTES								X									
SHOW-INPUT-DEFAULTS		X				X	X	X	X								
SHOW-INPUT-HISTORY		X				X	X	X	X								
SHOW-INSTALLATION-PATH								X	X								
SHOW-IOCF												X		X	@	@	
SHOW-ISAM-CACHING										X	X	X					
SHOW-ISAM-POOL-ATTRIBUTES								X	X	X	X						
SHOW-ISAM-POOL-LINK								X	X	X	X						
SHOW-JOB-CLASS								X	X								
SHOW-JOB-OPTIONS		X				X	X	X	X								
SHOW-JOB-STATUS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	E	E	
SHOW-JOB-STREAM										X	X						
SHOW-JOB-SWITCHES		X				X	X	X	X								
SHOW-JV		X				X	X	X	X					X	J	J	
SHOW-JV-ATTRIBUTES		X				X	X	X	X						\$	J	
SHOW-JV-LINK		X				X	X	X	X						\$	J	
SHOW-LINKAGE-AUDIT								X				X					
SHOW-LIVE-MIGRATION-HISTORY								X				X	X				
SHOW-MASTER-CATALOG-ENTRY								X	X	X	X	X	X	E	E		
SHOW-MEMORY-CONFIGURATION								X	X	X	X	X	X	R	R		
SHOW-MEMORY-POOL-STATUS								X	X	X	X						
SHOW-MIP-OPTIONS												X					
SHOW-MIP-PARAMETERS												X					
SHOW-MOUNT-PARAMETER		X						X					X	E	E		
SHOW-MSG-FILE-ASSIGNMENT						X	X	X	X			X					
SHOW-MSG-OPTIONS		X				X	X	X	X								
SHOW-MSG-SUBSCRIPTION													X	@	@		
SHOW-MSG-SUPPRESSION													X	@	@		

Tabelle 15: Commands with privileges

(Part 16 of 21)

Command	Privileges												BS with NBCONOPI=N	BS with NBCONOPI=Y			
	ACS-ADMINISTRATION	HARDWARE-MAINT.	HSMS-ADMIN.	POSIX-ADMIN.	PRINT-SERVICE-ADMIN.	SAT-FILE-EVALUATION	SAT-FILE-MANAG.	SECURITY-ADMIN.	STD-PROCESSING	SUBSYSTEM-MANAG.	SW-MONITOR-ADMIN.	TAPE-ADMIN.			TSOS	USER-ADMIN.	OPERATING
SHOW-NET-CLIENT-ALTERNATE													X		X	G	G
SHOW-NET-STORAGE													X		X	G	G
SHOW-NET-STORAGE-OCCUPATION													X				
SHOW-OPERATOR-ATTRIBUTES								X	X						X	@	@
SHOW-OPERATOR-ROLE								X	X						X	@	@
SHOW-PAGING-CONFIGURATION									X		X		X		X	R	R
SHOW-PENDING-MSG													X		X	@	@
SHOW-POSIX-STATUS										X							
SHOW-POSIX-USER-ATTRIBUTES				X					X						X		
SHOW-POSIX-USER-DEFAULTS				X					X						X		
SHOW-PRINT-JOB-ATTRIBUTES					X	X	X	X	X								
SHOW-PRINT-JOB-STATUS					X	X	X	X	X							S	S
SHOW-PRINTER-POOLS					X	X	X	X	X							\$	\$
SHOW-PUBSET-ATTRIBUTES													X		X	E	E
SHOW-PUBSET-CACHE-ATTRIBUTES											X		X		X		
SHOW-PUBSET-CATALOG-ALLOCATION													X				
SHOW-PUBSET-CONFIGURATION									X				X		X	@	@
SHOW-PUBSET-DEFINITION-FILE									X				X		X		
SHOW-PUBSET-FILE-SERVICES									X				X				
SHOW-PUBSET-IMPORT-EXPORT													X		X	@	@
SHOW-PUBSET-LOCKS													X				
SHOW-PUBSET-NET-STORAGE									X				X				
SHOW-PUBSET-OCCUPATION											X		X		X		
SHOW-PUBSET-PARAMETERS											X		X		X	@	@
SHOW-PUBSET-PROCESSING									X				X		X		
SHOW-PUBSET-RESTRICTION									X				X		X		
SHOW-PUBSET-SPACE-ALLOCATION													X		X	@	@
SHOW-PUBSET-SPACE-DEFAULTS											X		X		X		

Tabelle 15: Commands with privileges

Command	Privileges																
	ACS-ADMINISTRATION	HARDWARE-MAINT.	HSMS-ADMIN.	POSIX-ADMIN.	PRINT-SERVICE-ADMIN.	SAT-FILE-EVALUATION	SAT-FILE-MANAG.	SECURITY-ADMIN.	STD-PROCESSING	SUBSYSTEM-MANAG.	SW-MONITOR-ADMIN.	TAPE-ADMIN.	TSOS	USER-ADMIN.	OPERATING	BS with NBCONOPI=N	BS with NBCONOPI=Y
SHOW-PUBSET-SPACEPRO-HISTORY													X				
SHOW-PUBSET-SPACEPRO-OPTIONS													X				
SHOW-RESOURCE-ALLOCATION		X				X	X		X						X	E	E
SHOW-RESOURCE-REQUESTS													X		X	E	E
SHOW-RESTART-OPTIONS															X	R	R
SHOW-RETURNCODE		X				X	X	X	X								
SHOW-RFA-CONNECTIONS						X	X		X								
SHOW-SDF-OPTIONS		X				X	X	X	X				X				
SHOW-SDF-PARAMETERS													X			@	@
SHOW-SELECTED-PRODUCT-VERSION									X								
SHOW-SERSLOG-STATUS													X		X	A	A
SHOW-SHARED-PUBSET									X				X		X	E	E
SHOW-SNAPSET-CONFIGURATION			X						X				X		X		
SHOW-SNAPSHOT-STATUS													X		X	R	R
SHOW-SPACE-SATURATION-LEVELS											X		X		X		
SHOW-SPACEPRO-PARAMETERS													X				
SHOW-SPACEPRO-STATUS													X				
SHOW-SPOOL-CHARACTER-SETS					X	X	X	X	X							\$	\$
SHOW-SPOOL-DEVICES					X	X	X	X	X							\$	\$
SHOW-SPOOL-FILTERS		X			X	X	X	X	X								
SHOW-SPOOL-FORMS					X	X	X	X	X							\$	\$
SHOW-SPOOL-PARAMETERS					X	X	X	X	X							\$	\$
SHOW-STORAGE-CLASS									X				X				
SHOW-SUBSYSTEM-ATTRIBUTES									X	X							
SHOW-SUBSYSTEM-INFO										X							
SHOW-SUBSYSTEM-STATUS									X	X					X	R	R
SHOW-SYNTAX-VERSIONS		X				X	X	X	X								
SHOW-SYSEVENT-LOG									X						X		

Tabelle 15: Commands with privileges

Command	Privileges													BS with NBCONOPI=N	BS with NBCONOPI=Y	
	ACS-ADMINISTRATION	HARDWARE-MAINT.	HSMS-ADMIN.	POSIX-ADMIN.	PRINT-SERVICE-ADMIN.	SAT-FILE-EVALUATION	SAT-FILE-MANAG.	SECURITY-ADMIN.	STD-PROCESSING	SUBSYSTEM-MANAG.	SW-MONITOR-ADMIN.	TAPE-ADMIN.	TSOS			USER-ADMIN.
SHOW-SYSEVENT-LOG-ATTRIBUTES								X						X		
SHOW-SYSTEM-FILE-ASSIGNMENTS		X				X	X	X	X							
SHOW-SYSTEM-INFORMATION	X	X	X	X	X	X	X	X	X	X	X	X	X	X	@	@
SHOW-SYSTEM-PARAMETERS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	@	@
SHOW-SYSTEM-STATUS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	E	E
SHOW-TAPE-STATUS		X				X	X		X			X		X	E	E
SHOW-TERMINAL-ATTRIBUTES		X				X	X	X	X			X				
SHOW-TERMINAL-OPTIONS		X				X	X	X	X			X				
SHOW-TEST-OPTIONS	X	X	X	X	X	X	X	X	X	X	X	X	X			
SHOW-TRACE-STATUS											X	X		X	R	R
SHOW-USER-ATTRIBUTES		X				X	X	X	X					X	\$	\$
SHOW-USER-STATUS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	E	E
SHOW-USER-SWITCHES		X				X	X	X	X							
SHOW-VARIABLE		X				X	X	X	X					X		
SHOW-VOLUME-SET-LIST												X				
SHUTDOWN														X	R	R
SIMULATE-SPACEPRO-EVENT												X				
SKIP-COMMANDS		X				X	X	X	X							
START-ACCOUNTING												X				
START-ACS	X															
START-CONFIGURATION-UPDATE														X	G	G
START-EXECUTABLE-PROGRAM		X				X	X	X	X							
START-FILE-CACHING									X			X				
START-GS-TRACE												X				
START-HARDWARE-AUDIT									X			X				
START-HEL-LOGGING		X										X				
START-JOB-STREAM												X		X	J	J
START-LINKAGE-AUDIT								X				X				

Tabelle 15: Commands with privileges

Command	Privileges																
	ACS-ADMINISTRATION	HARDWARE-MAINT.	HSMS-ADMIN.	POSIX-ADMIN.	PRINT-SERVICE-ADMIN.	SAT-FILE-EVALUATION	SAT-FILE-MANAG.	SECURITY-ADMIN.	STD-PROCESSING	SUBSYSTEM-MANAG.	SW-MONITOR-ADMIN.	TAPE-ADMIN.	TSOS	USER-ADMIN.	OPERATING	BS with NBCONOPI=N	BS with NBCONOPI=Y
START-POSIX-INSTALLATION				X									X				
START-POSIX-SHELL								X									
START-PRINTER-OUTPUT					X	X	X	X	X						X	S	S
START-PROGRAM		X				X	X	X	X								
START-PUBSET-CACHING													X				
START-RESLOG-EVALUATION											X		X				
START-RESOURCE-COLLECTION															X	J	J
START-SERSLOG													X		X	A	A
START-SPACEPRO-MONITORING													X				
START-SUBSYSTEM										X					X	R	R
START-TAPE-OUTPUT					X										X	S	S
START-TAPE-REPLAY					X										X	S	S
START-TASK-MEASUREMENT	X		X	X	X	X	X	X	X	X	X	X	X	X			
START-TRACE													X		X	R	R
STOP-ACCOUNTING													X				
STOP-CONFIGURATION-UPDATE															X	G	G
STOP-FILE-CACHING									X				X				
STOP-GS-TRACE													X				
STOP-HARDWARE-AUDIT									X				X				
STOP-HEL-LOGGING		X											X				
STOP-JOB-STREAM													X		X	J	J
STOP-LINKAGE-AUDIT									X				X				
STOP-PRINTER-OUTPUT					X	X	X	X	X						X	S	S
STOP-PUBSET-CACHING													X				
STOP-RESOURCE-COLLECTION															X	J	J
STOP-SERSLOG													X		X	A	A
STOP-SPACEPRO-MONITORING													X				
STOP-SUBSYSTEM										X					X	R	R

Tabelle 15: Commands with privileges

Command	Privileges												BS with NBCONOPI=N	BS with NBCONOPI=Y			
	ACS-ADMINISTRATION	HARDWARE-MAINT.	HSMS-ADMIN.	POSIX-ADMIN.	PRINT-SERVICE-ADMIN.	SAT-FILE-EVALUATION	SAT-FILE-MANAG.	SECURITY-ADMIN.	STD-PROCESSING	SUBSYSTEM-MANAG.	SW-MONITOR-ADMIN.	TAPE-ADMIN.			TSOS	USER-ADMIN.	OPERATING
STOP-TAPE-OUTPUT					X										X	S	S
STOP-TAPE-REPLAY					X										X	S	S
STOP-TASK-MEASUREMENT	X		X	X	X	X	X	X	X	X	X	X	X	X			
STOP-TRACE												X		X	R	R	
STORE-ALIAS-CATALOG	X					X	X	X	X								
TURN														X	E	E	
UMOUNT-NET-STORAGE												X		X	G	G	
UNLOAD-TAPE														X	T	T	
UNLOCK-DEVICE														X	G	G	
UNLOCK-DISK														X	D	D	
UNLOCK-FILE-LINK		X				X	X		X								
UNLOCK-PRODUCT-VERSION										X							
UNLOCK-SUBSYSTEM									X								
UNLOCK-USER								X					X		\$	\$	
WAIT-EVENT		X				X	X	X	X								
WRITE-ACCOUNTING-RECORD		X						X									
WRITE-IOCF												X					
WRITE-SPOOL-TAPE		X			X	X	X	X	X							\$	\$
WRITE-TEXT		X				X	X	X	X								

Tabelle 15: Commands with privileges

(Part 21 of 21)

¹ Command not available with NBCONOPI=Y

² Command not available with NBCONOPI=N

3.5 Command aliases

Some of the commonest commands have an additional alias name, marked “Alias” to the right of the full command name in the syntax diagram (see also [section “SDF syntax representation” on page 1-37](#)).

The alias consists of up to 8 characters (A...Z). An exception is made in the case of the “START commands” (for example, POSIX-SHELL is the alias for START-POSIX-SHELL). The alias is derived from the full command name, with the name elements always being abbreviated in the same way (e.g. CR for CREATE).

In some cases there may be two aliases (e.g. CL and CLP for CALL-PROCEDURE). The defined command alias is guaranteed in the long term. The alias cannot be further abbreviated.

The following overview lists all the commands described in Volumes 2 to 7 together with their aliases.

Command	Alias
ADD-CRYPTO-PASSWORD	ADCPW
ADD-FILE-LINK	ADFL
ADD-PASSWORD	ADPW
BROADCAST	BCST
CALL-PROCEDURE	CL / CLP
CANCEL-JOB	CNJ
CANCEL-PROCEDURE	CNP
CANCEL-PROGRAM	CNPG
CHANGE-FILE-LINK	CGFL
COPY-FILE	CPF
COPY-JV	CPJV
COPY-POSIX-FILE	CPXF / BS2CP
COPY-SYSTEM-FILE	CPSF
CREATE-FILE	CRF
CREATE-FILE-GENERATION	CRFGN
CREATE-FILE-GROUP	CRFGP
CREATE-JV	CRJV
DECLARE-VARIABLE	DCV
DELETE-FILE	DLF
DELETE-FILE-GENERATION	DLFGN

Table 16: Command aliases (Part 1 of 4)

Command	Alias
DELETE-FILE-GROUP	DLFGP
DELETE-JV	DLJV
DELETE-SYSTEM-FILE	DLSF
EDIT-FILE-ATTRIBUTES	EDFA
EDIT-FILE-LINK	EDFL
EDIT-JOB	EDJ
EDIT-JOB-OPTIONS	EDJO
EDIT-JV	EDJV
EDIT-JV-ATTRIBUTES	EDJVA
ENTER-JOB	ENJ
ENTER-PROCEDURE	ENP
EXECUTE-POSIX-CMD	ECXCMD
HELP-MSG-INFORMATION	HP / HPMSGI
HELP-SDF	HP SDF
INFORM-PROGRAM	IFPG
LOAD-ALIAS-CATALOG	LDAC
LOAD-EXECUTABLE-PROGRAM	LDX
LOAD-PROGRAM	LDPG
MESSAGE	MSG
MODIFY-FILE-ATTRIBUTES	MD / MDFA
MODIFY-FILE-GENERATION-SUPPORT	MDFGNS
MODIFY-FILE-GROUP-ATTRIBUTES	MDFGPA
MODIFY-ISAM-CACHING	MDISAMC
MODIFY-JOB	MDJ
MODIFY-JOB-CLASS	MDJCL
MODIFY-JOB-OPTIONS	MDJO
MODIFY-JOB-STREAM	MDJSR
MODIFY-JOB-SWITCHES	MDJSW
MODIFY-JV	MDJV
MODIFY-JV-ATTRIBUTES	MDJVA
MODIFY-JV-CONDITIONALLY	MDJVC
MODIFY-MONJV	MDMJV

Table 16: Command aliases (Part 2 of 4)

Command	Alias
MODIFY-SDF-OPTIONS	MDSDFO
MODIFY-TEST-OPTIONS	MDTSO
MODIFY-USER-SWITCHES	MDUSW
MOVE-JOBS	MVJ
MOVE-TASK-TO-CATEGORY	MTTC
PRINT-DOCUMENT	PRDO
PURGE-ALIAS-CATALOG	PGAC
REMOVE-CRYPTO-PASSWORD	RMCPW
REMOVE-FILE-LINK	RMFL
REMOVE-JV-LINK	RMJVL
REMOVE-PASSWORD	RMPW
REMOVE-TASKLIB	RMTL
RESET-INPUT-DEFAULTS	RSID
RESTORE-SDF-INPUT	RRSDFI
RESUME-PROCEDURE	RUP
RESUME-PROGRAM	RU / RUPG
SET-FILE-NAME-PREFIX	STFNP
SET-JOB-STEP	STJSP
SET-JV-LINK	STJVL
SET-LOGON-PARAMETERS	STLGP
SET-TASKLIB	STTL
SET-VARIABLE	STV
SHOW-FILE	SHF
SHOW-FILE-ATTRIBUTES	SH / SHFA
SHOW-FILE-LINK	SHFL
SHOW-FILE-NAME-PREFIX	SHFNP
SHOW-INPUT-DEFAULTS	SHID
SHOW-INPUT-HISTORY	SHIH
SHOW-ISAM-CACHING	SHISAMC
SHOW-JOB-OPTIONS	SHJO
SHOW-JOB-STATUS	SHJS
SHOW-JOB-SWITCHES	SHJSW

Table 16: Command aliases (Part 3 of 4)

Command	Alias
SHOW-JV	SHJV
SHOW-JV-ATTRIBUTES	SHJVA
SHOW-JV-LINK	SHJVL
SHOW-MASTER-CATALOG-ENTRY	SHMCE
SHOW-PENDING-MSG	SHMSG
SHOW-RETURNCODE	SHRTC
SHOW-SDF-OPTIONS	SHSDFO
SHOW-SYSTEM-FILE-ASSIGNMENTS	SHSFA
SHOW-SYSTEM-STATUS	SHSS
SHOW-TEST-OPTIONS	SHTSO
SHOW-USER-ATTRIBUTES	SHUA
SHOW-USER-STATUS	SHUS
SHOW-USER-SWITCHES	SHUSW
SHOW-VARIABLE	SHV
START-EXECUTABLE-PROGRAM	SRX
START-PRINTER-OUTPUT	SRPRTO
START-PROGRAM	SR / SRPG
START-POSIX-SHELL	POSIX-SH
STORE-ALIAS-CATALOG	STAC
WRITE-TEXT	WRTX

Table 16: Command aliases (Part 4 of 4)

3.6 Commands of internal components

BS2000 OSD/BC contains some components which are used only for internal purposes, e.g. test purposes. Commands of these components are not described in this manual as they have not been generally released for customers. These commands are listed in the table below.

Command	Component	Function
ACTIVATE-SYSTEM-HOOK	AIDSYSA	Activate system hook testpoints
ADD-SYSTEM-HOOK	AIDSYSA	Set a system hook testpoint
DEACTIVATE-SYSTEM-HOOK	AIDSYSA	Deactivate system hook testpoints
MODIFY-SYSTEM-HOOK	AIDSYSA	Change a system hook testpoint
MODIFY-SYSTEM-HOOK-PROCESSING	AIDSYSA	Change options for system hook testpoints
REMOVE-SYSTEM-HOOK	AIDSYSA	Remove a system hook testpoint
SHOW-MAP-INFORMATION	AIDSYSA	Display information on BLS icons
SHOW-SYMBOL-INFORMATION	AIDSYSA	Display information on DSect icons of the system
SHOW-SYSTEM-HOOK-ATTRIBUTES	AIDSYSA	Display system hook testpoints
SHOW-SYSTEM-HOOK-LOGGING	AIDSYSA	Display logging data for system hook testpoints
SHOW-SYSTEM-HOOK-PROCESSING	AIDSYSA	Display options for system hook testpoints
DELETE-ORDER	ASTI	Delete request for a service
MODIFY-SERVICE-PARAMETER	ASTI	Modify service parameters (e.g. use authorization)
PROCESS-ORDER	ASTI	Fetch jobs from ASTI or return results
REQUEST-ORDER-RESULT	ASTI	Request the result of an asynchronous job
SEND-ORDER	ASTI	Send a request for a service
SHOW-ORDER-STATUS	ASTI	Display the status of requests for services
SHOW-SERVICE-STATUS	ASTI	Display the status of one or all services
START-SERVICE	ASTI	Start a service
STOP-SERVICE	ASTI	Stop a service

Table 17: Commands of internal components (Part 1 of 3)

Command	Component	Function
ADD-TELESERVICE-MSG	BS2CP	Add the specified messages to the list of messages which are displayed in the diagnostics center
GRANT-PROP-CONNECTION	BS2CP	Internal command: PROP-XT calls operating
REMOVE-TELESERVICE-MSG	BS2CP	Remove the specified messages from the list of messages which are displayed in the diagnostics center
SHOW-TELESERVICE-MSG	BS2CP	Display the messages which are displayed in the diagnostics center
LOAD-TPR-PROGRAM	CAPRI	Load a TPR program
SHOW-TPR-PROGRAM-STATUS	CAPRI	Display information on loaded entries
START-TPR-PROGRAM	CAPRI	Start a TPR program
UNLOAD-TPR-PROGRAM	CAPRI	Unload a TPR program
END-IDIAS	IDIAS	Task is no longer the IDIAS monitor task
ADD-INSTRUCTION-STOP	IDIAS	Set IDIAS instruction stop
ADD-WRITE-STOP	IDIAS	Set IDIAS write stop
BEGIN-IDIAS	IDIAS	Task becomes IDIAS monitor task
CREATE-SYSTEM-DUMP	IDIAS	Generate IDIAS-NO-EDIT dump
LOAD-IDIAS-EXIT	IDIAS	Load IDIAS exit module
MODIFY-IDIAS-DEFAULTS	IDIAS	Modify global IDIAS parameters
MODIFY-INSTRUCTION-STOP	IDIAS	Modify IDIAS instruction stop
MODIFY-WRITE-STOP	IDIAS	Modify IDIAS write stop
REMOVE-INSTRUCTION-STOP	IDIAS	Reset IDIAS instruction stop
REMOVE-WRITE-STOP	IDIAS	Reset IDIAS write stop
RESUME-IDIAS-TEST-TASK	IDIAS	Activate IDIAS test task
SHOW-IDIAS-DEFAULTS	IDIAS	Display global IDIAS parameters
SHOW-IDIAS-STATUS	IDIAS	Display all IDIAS stops and FTT
SHOW-IDIAS-TRACES	IDIAS	Display IDIAS foreign task traces
SHOW-INSTRUCTION-STOPS	IDIAS	Display IDIAS instruction stops
SHOW-SYSTEM-DUMP-STATUS	IDIAS	Display IDIAS system dump status
SHOW-WRITE-STOPS	IDIAS	Display IDIAS write stops

Table 17: Commands of internal components (Part 2 of 3)

Command	Component	Function
TRACE-INSTRUCTIONS	IDIAS	IDIAS foreign task trace (FTT)
UNLOAD-IDIAS-EXIT	IDIAS	Unload IDIAS exit module
WAIT-IDIAS-EVENT	IDIAS	Wait for IDIAS stop event

Table 17: Commands of internal components (Part 3 of 3)

Related publications

You will find the manuals on the internet at <http://manuals.ts.fujitsu.com>. You can order printed versions of manuals which are displayed with the order number.

- [1] **BS2000 OSD/BC
Commands**
User Guide
- [2] **openNet Server (BS2000)
BCAM**
Reference Manual
- [3] **BLSSERV
Dynamic Binder Loader / Starter in BS2000**
User Guide
- [4] **CALENDAR (BS2000)**
User Guide
- [5] **DAB (BS2000)
Disk Access Buffer**
User Guide
- [6] **DCAM (BS2000, TRANSDATA)
Macros**
User Guide
- [7] **DCAM (BS2000, TRANSDATA)
Program Interfaces**
Reference Manual
- [8] **BS2000 OSD/BC
Diagnostics Handbook**
User Guide

- [9] **BS2000 OSD/BC
Utility Routines**
User Guide

- [10] **Distributed Print Services (BS2000)
Printing in Computer Networks**
User Guide

- [11] **DRV (BS2000)
Dual Recording by Volume**
User Guide

- [12] **BS2000 OSD/BC
DMS Macros**
User Guide

- [13] **BS2000 OSD/BC
Introductory Guide to DMS**
User Guide

- [14] **BS2000 OSD/BC
Introduction to System Administration**
User Guide

For S and SQ servers, the manual of the corresponding BS2000 version, supplemented by a Readme file for BS2000 OSD/BC V10.0, still applies.

- [15] **SDF (BS2000)
SDF Dialog Interface**
User Guide

- [16] **ELSA (BS2000)
Error Logging System Analysis**
User Guide

- [17] **openFT (BS2000)
Enterprise File Transfer in the Open World**
User Guide

- [18] **HSMS (BS2000)
Hierarchical Storage Management System
Volume 1: Functions, Management and Installation**
User Guide

- [19] **IMON** (BS2000)
Installation Monitor
User Guide
- [20] **JV** (BS2000)
Job Variables
User Guide
- [21] **LMS** (BS2000)
SDF-Format
User Guide
- [22] **BS2000 OSD/BC**
Executive Macros
User Guide
- [23] **MAREN** (BS2000)
Volume 1: Basics of MTC Management
User Guide
- [24] **HIPLEX AF** (BS2000)
Subsystem Management in BS2000
User Guide
- [25] **HIPLEX MSCF** (BS2000)
BS2000-Processor Networks
User Guide
- [26] **PCS** (BS2000)
Performance Control Subsystem
User Guide
- [27] **BS2000 OSD/BC**
Performance Handbook
User Guide
- [28] **POSIX** (BS2000)
POSIX Basics for Users and System Administrators
User Guide
- [29] **POSIX** (BS2000)
Commands
User Guide

- [30] **PRM** (BS2000)
User Guide
- [31] **RFA** (BS2000)
Remote File Access
User Guide
- [32] **RSO** (BS2000)
Remote SPOOL Output
User Guide
- [33] **SDF-A** (BS2000)
User Guide
- [34] **SDF-P** (BS2000)
Programming in the Command Language
User Guide
- [35] **SECOS** (BS2000)
Security Control System
User Guide
- [36] **SECOS** (BS2000)
Security Control System - Audit
User Guide
- [37] **SHC-OSD** (BS2000)
Storage Host Komponente
User Guide
- [38] **SPACEOPT** (BS2000)
Disk Optimization and Reorganization
User Guide
- [39] **openSM2** (BS2000)
Software Monitor
User Guide
- [40] **SORT** (BS2000)
SDF-Format
User Guide
- [41] **SPCONV** (BS2000)
User Guide

[42] **Spool & Print - Commands** (BS2000)
User Guide

[43] **SPOOL** (BS2000)
User Guide

[44] **SPSERVE** (BS2000)
User Guide

[45] **BS2000 OSD/BC
System Managed Storage**
User Guide

[46] **BS2000 OSD/BC
System Installation**
User Guide

For S and SQ servers, the manual of the corresponding BS2000 version, supplemented by a Readme file for BS2000 OSD/BC V10.0, still applies.

[47] **TIAM** (TRANSDATA, BS2000)
User Guide

[48] **Unicode in BS2000**
Unicode Introduction

[49] **DSSM / SSCM** (BS2000)
Subsystem Management in BS2000
User Guide

[50] **VM2000** (BS2000)
Virtual Machine System
User Guide

[51] **XHCS** (BS2000)
8-Bit Code Processing in BS2000
User Guide

[52] **SQ Series Business Servers
Operation and Administration**
User Guide

[53] **BS2ZIP**
Zip Archiving in BS2000
User Guide

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