BS2000/OSD-BC V8.0

Accounting records

Comments… Suggestions… Corrections…

The User Documentation Department would like to know your opinion on this manual. Your feedback helps us to optimize our documentation to suit your individual needs.

Feel free to send us your comments by e-mail to:
manuals@ts.fujitsu.com

Certified documentation
according to DIN EN ISO 9001:2000

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 9001:2000.

cognitas. Gesellschaft für Technik-Dokumentation mbH
www.cognitas.de

Copyright and Trademarks

Contents

Contents

1 Preface

The accounting system of BS2000/OSD is responsible for logging and storing data for user accounting and operations accounting.

The data acquired for user accounting enables the data center to bill users for resources and services received.
The information collected for operations accounting provides an uninterrupted survey of the utilization and availability of the entire server system.

The accounting routine writes the collected data in the form of different types of accounting records to a file especially provided for that purpose. This accounting file is then further evaluated using special programs.

1.1 Summary of contents

The accounting system of BS2000/OSD is described in the „Introductory Guide to Systems Support" manual [2].

The present manual documents the accounting records:

- section "Overview of accounting records in BS2000/OSD" on page 6
- chapter 2 "Structure of the accounting records" on page 7
- chapter 3 "Accounting records" on page 15

References in the text to other publications consist of shortened titles. The full title of each publication referred to can be found under "Related publications" at the back of the Ready Reference.

1.2 Overview of accounting records in BS2000/OSD

Accounting record		Max. length in bytes	Page
For user accounting			
JOBS	Job start accounting record	314	17
PACC	Periodic program accounting record	403	41
PDMP	User dump accounting record	78	45
PRGS	Program start accounting record	476	32
PRGT	Program termination accounting record	528	36
SPLO	Spoolout accounting record	474	46
TASK	Task accounting record	400	23
TDEV	Device and volume accounting record	492	55
TATR	Task attribute change accounting record	70	63
For space accounting			
DALC	Space allocation record	492	71
DSPC	Space stocktaking record	492	66
DSPP	Space stocktaking record for private disks	492	69
User-specific accounting records			
UACC	User ledger-mark record	382	76
UDAT	User data record	326	74
Freely definable user accounting records		496 with record field length	79
For operations accounting			
ACLS	Accounting close record	610	88
AOPN	Accounting open record	698	83
RCPU	CPU availability record	70	91
RSRV	Service accounting record	126	93
For DSSM			
ESMC	Subsystem initialization accounting record	54	98
ESMD	Subsystem termination accounting record	54	99

2 Structure of the accounting records

This section describes the structure of the individual record sections. It also shows how each record section may be addressed so that access is possible regardless of future extensions.

All commands referred to are described in the "Commands" manual [1], the macros ARDS and ASPC in the "Executive Macros" manual [4], and the macros CATAL, FILE and RELTFT in "DMS Macros" [3].
The software product RAV is available for analyzing the accounting data. For further information see the "RAV" manual [6].

The following attributes are used in the representation of the data fields:

Field	Serial number of the data field within the record section concerned.
Displace-ment	Relative distance of the data field to the beginning of the record section concerned.
Length	Length of data field in bytes.
Format	A = alphanumeric
	B = binary
	B2 = binary representation of CPU time
	C = printable characters, including special characters
	F = file name
	X = non-printable characters
	Z = unpacked decimal (*)
	* = to be defined in accordance with the relevant record types or extension elements
	- = reserved for future extensions; contains either blanks or binary zeros
(*)	The time is shown in the form *hhmmss*, the date is shown in the form *yymmdd*

An accounting record consists of the following four sections:

(A) Record definition	: record ID, time stamp...
(B) Identification section	: user ID, account number, resources monitored, ...
(C) Basic information	: standard data
(D) Variable information	: record extension

(A) Record definition

The record definition contains a record identifier separating the individual accounting records from one another, a time stamp and data on the length of the identification section and of the basic information.

Address of record definition = beginning of record

Format and contents:

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	4	A	Record identifier [1]
2	04	4	8	B	Time stamp of TOD clock [2]
3	0C	12	2	B	Length of identification section
4	0E	14	2	B	Length of basic information
5	10	16	4	–	– reserved –

Length of record definition: 20 bytes

The record definition remains fixed for all accounting records.

Notes

1) The record identifier serves to distinguish the individual types of record.
   Users with the required authorization, as well as system exit routines, may define accounting records of their own with separate record identifiers.
   Such identifiers should start with either X, Y or Z in order to avoid confusion with other types of accounting records. These accounting records need not correspond to the structure described here.

2) The time stamp is entered in the record by the system as the last piece of information after the record has been completed or transferred to the accounting system.
Since the time stamp of the TOD clock is mandatory, i.e. it is also written to user accounting records, the user must provide an 8-byte field for this purpose. The time stamp contains the universal world time (UTC).

Record definition schema:

X' 00'	Record identifier	
X' 04'	Time stamp of the TOD clock (TODR)	
X' 08'	(in the first 52 bits)	X' 000'
X' 0C'	Length of identification	Length of basic information
X' 10'	– reserved –	
X' 14'		

(B) Identification section

Depending on the accounting record, the identification section describes

– the posted user task
– the monitored resource
– the installation and the operating system
– the monitored subsystem
– the posted system task

Address of identification section = beginning of record
+ length of record definition

The structure and contents of the various types of identification are described at the beginning of the subsections on user accounting, space accounting, system availability and service accounting records.

Refer to field 3 of the record definition to determine the actual length of the identification section.

(C) Basic information

The basic information includes values of basic data such as start and end times, CPU times, etc. which are present in every accounting record that is output.

Address of basic information = beginning of record
                              + length of record definition
                              + length of identification section

The structure and contents of this record section are described under the individual accounting records.

The "basic information" section has a fixed length for each accounting record (field 4 of the record definition).

(D) Variable information

The variable information comprises an extension header and a number of record extensions. The extension header shows the distance to the beginning of the record for each extension. Each record extension contains an extension identifier and a length entry. With a few exceptions, the record extensions can be activated/deactivated individually, with the result that information which is not required does not occupy any space in the accounting file (see the commands START-ACCOUNTING and MODIFY-ACCOUNTING-PARAMETERS).

● Extension header

Format and contents:

Address of extension header = beginning of record
                             + length of record definition
                             + length of identification section
                             + length of basic iinformation

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	B	Number of record extensions [1]
2	02	2	2	B	Displacement of 1st extension [2]
3	04	4	2	B	Displacement of 2nd extension
:	:	:	:	:	
i+1	2 * i		2	B	Displacement of i-th extension [3] [4]
:	:		:	:	
N+1	2 * N		2	B	Displacement of N-th extension [5]

Length of extension header: (2*N+2) bytes

Notes

1) The number N is fixed for each record type; N=0 means that no record extensions are present.

2) The extension displacements refer to the beginning of the record.

3) The relative position of an extension displacement in the extension header defines the number of the corresponding record extension. There is a unique correlation between the extension type (expressed by the extension identifier) and the extension number. Therefore a given record extension is addressed via its associated displacement in the extension header.

4) If an extension is not supplied, either because it is output only on certain conditions or because it has been deactivated by systems support, then its associated displacement equals zero.

5) The number N, and thus the number of the final extension, is stored in field 1 of the extension header.

● Record extension

Extensions to accounting records are marked by a corresponding identifier and an associated number.

Address of 1st record extension = beginning of record
+ displacement of 1st extension

The following basic types of record extension exist:

a) Structure field extension

A structure field extension contains a variable number of elements. Each of these elements has the same length and the same structure, depending on the type of extension.

Format and contents:

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier
2	02	2	1	B	Number of elements (K) [1]
3	03	3	1	B	Element length (L) [2]
4	04	4	L	*	1st element [3]
5	L+4		L	*	2nd element
:	:		:	:	:
i+3	(i-1)*L+4		L	*	i-th element
:	:		:	:	:
K+3	(K-1)*L+4		L	*	K-th element

Length of structure field extension: $(K*L+4)$ bytes

Notes

1) The number K is variable.

2) The element length L is fixed for a given type of extension.

3) For the structure of the elements see the extension descriptions under the relevant accounting records. This structure is uniform for all elements of a structure field extension.

b) Character string extension

A character string extension contains a variable-length string, which need not be printable.

Format and contents:

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier
2	02	2	1	B	X'00' [1]
3	03	3	1	B	String length (L) [2]
4	04	4	L	C/X	String [3]

Length of character string extension: (L+4) bytes

Notes

1) This byte is reserved and contains a binary zero. It serves to distinguish a character string extension from a structure field extension, thus enabling a general analysis program to edit record extensions in accordance with their format without knowing their contents or meaning.

2) The length L is variable.

3) The character string is normally unstructured, as seen from the accounting system. Whether the string consists of printable or non-printable characters is irrelevant. An internal structure or a more specific definition of the format may result implicitly from the meaning specified for the relevant extensions under the various record types. A structured string may then consist of a number of fixed-length fields and a variable-length substring in the last field. The length of the substring is derived from the extension length (L) minus the sum of the lengths of the fixed-length fields. To facilitate analysis, the substring length is entered in a field preceding the substring (see, for example, the program name extension in the program start accounting record).

c) Case distinction extension

A case distinction extension contains a structured element of variable length. Depending on the case, this element may contain different, mutually exclusive items of information. The first data field of this element consists of a case identifier determining the element length, structure and contents.

Format and contents:

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier
2	02	2	1	B	X'01' [1]
3	03	3	1	B	Length of subsequent data [2]
3	04	3	k	*	Case identifier [3]
5	k+4	k+4	L-k	*	Case-specific data [3]

Length of case distinction extension: (L+4) bytes

Notes

1)   The number of subsequent "elements" is always 1.

2)   The length L includes the case identifier.

3)   The case identifier length is 1 to 4 bytes.

3 Accounting records

3.1 Accounting records for user accounting

User identification

The identification section of accounting records for the accounting of user jobs consists of a user identification.

Format and contents:

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	8	A	User ID
2	08	8	8	A	Account number
3	10	16	4	C	TSN
4	14	20	8	A	Group name [1]

Length of user identification: 28 bytes

Note

1) If the user ID does not belong to any group, the string "UNIVERS" will be entered here.

User identification schema

```
X'14'  ┌─────────────────────────────┐
X'18'  │         User ID             │
X'1C'  ├─────────────────────────────┤
X'20'  │       Account number        │
X'24'  ├─────────────────────────────┤
       │         TSN                 │
X'28'  ├─────────────────────────────┤
       │       Group name            │
X' 30' └─────────────────────────────┘
```

3.1.1   JOBS – Job start accounting record

The job start accounting record is written when a user job has been successfully started.

Maximum length of the job start accounting record: 314 bytes

(A) Record definition: record ID "JOBS"

(B) Identification section: User identification

(C) Basic information

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	6	Z	Date of job acceptance [1]
2	06	6	6	Z	Time of job acceptance [2]
3	0C	12	6	Z	Date of job start [3]
4	12	18	6	Z	Time of job start
5	18	24	8	A	Job name
6	20	32	2	Z	Century of job acceptance [4]
7	22	34	2	Z	Century of job start [4]
8	24	36	1	C	Season identifier for job acceptance [5]
9	25	37	1	C	Season identifier for job start [5]
10	26	38	2	–	– reserved –

Length of the basic information: 40 bytes

Notes

1) Date in the form `yymmdd`.

   For batch jobs: Time of inclusion in job queue
   For interactive jobs: Time of SET-LOGON-PARAMETERS processing

2) Time in the form `hhmmss`.

3) Time of LOGON processing.

4) E.g. the string "19" indicates the year 1999.

5) "S" for standard time (summer); "W" for daylight saving time (winter).

(D) Variable information

The variable information of the job start accounting record contains four record extensions.
Length of extension header: 10 bytes
The individual extensions in the record are aligned on a word boundary; depending on the record, this may mean that two bytes with irrelevant contents are added to the end of the extension header.

Extension 1: Job origin

This record extension is a case distinction extension. Its identifier is always "JO".
Its structure and contents depend on the case identifier, which also indicates how the job was created:

a) ENTER job extension
   The job was created by an ENTER-JOB or ENTER-PROCEDURE command.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "JO"
2	02	2	1	B	Number of elements (X'01')
3	03	3	1	B	Element length (X'10')
4	04	4	2	A	Case identifier "EN"
5	06	6	1	A	Place of job creation
					' ' = home server
					'R' = remote server [1]
6	07	7	1	A	Job creator
					'U' = user task [2]
					'O' = operator task
					'$' = system task
7	08	8	8	A	Name of server where the job was created [3]
8	10	16	4	C	TSN of creator job [4]

Length of ENTER job extension: 20 bytes

Notes

1) This indicator is set if the command was issued on another server within a server network.

2) The job-creating job may execute under
   – the same user ID as the job created.
   – a different user ID or.
   – the systems support ID.

   The TSN of the creating job establishes a connection to the task accounting record of that job. The user ID and account number of the job creator can thus be determined.

3) If the command was issued on another server, the name of the job-creating server is entered here; otherwise this contains 8 blanks.

4) TSN of the user job (format C), or TSN of the operator/system task (format C), that started the job.

b) Dialog job extension
   The interactive job was generated through a SET-LOGON-PARAMETERS command on the data display terminal.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "JO"
2	02	2	1	B	Number of elements (X'01')
3	03	3	1	B	Element length (X'1C')
4	04	4	2	A	Case identifier "$D"
5	06	6	1	A	Type of dialog partner
					'T' = Terminal
					'A' = Application
6	07	7	1	–	– reserved –
7	08	8	8	A	Server name
8	10	16	8	A	Name of terminal /application
9	18	24	8	A	Terminal type

Length of dialog job extension: 32 bytes

c) REPEAT job extension
   The job was repeated as a result of the REPEAT option.

Field number	Displacement		Length	Format	Meaning
	hex	dec	(bytes)		
1	00	0	2	A	Extension identifier "JO"
2	02	2	1	B	Number of elements (X'01')
3	03	3	1	B	Element length (X'04')
4	04	4	2	A	Case identifier "RE" [1]
5	06	6	2	B	Repetition counter [2]

Length of REPEAT job extension: 8 bytes

Notes

1)   This job origin category relates only to jobs that are repeated on the basis of a REPEAT
     entry in the ENTER-JOB, ENTER-PROCEDURE or MODIFY-JOB command.
     Jobs that are restarted due to a RERUN-AFTER-CRASH entry following abnormal
     termination (system crash) are treated in the same way as jobs started for the first time.

2)   The repetition counter starts at 1 for the first job repetition and is incremented by 1 for
     every additional job repetition.

d) Subjob extension
   The job was created via a privileged mechanism as a subjob of a user job.

Field number	Displacement		Length	Format	Meaning
	hex	dec	(bytes)		
1	00	0	2	A	Extension identifier "JO"
2	02	2	1	B	Number of elements (X'01')
3	03	3	1	B	Element length (X'10')
4	04	4	2	A	Case identifier "$J"
5	06	6	1	–	– reserved –
6	07	7	1	–	– reserved –
7	08	8	8	A	Identifier of the subsystem that created the subjob [1]
8	10	16	4	Z/C	TSN of the creator job

Length of subjob extension: 20 bytes

Note

1)   At present always "$ARCHIVE" or "POSIX".

Extension 2: Job definition

This record extension is a structure field extension comprising one element.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "JD"
2	02	2	1	B	Number of elements (X'01')
3	03	3	1	B	Element length (X'18')
4	04	4	8	A	Job class
5	0C	12	1	A	Job scheduling priority
6	0D	13	11	–	Job start information [1]
7	18	24	1	A	Task execution priority for LOGON
8	19	25	3	A	Task scheduling attribute ('TP' / 'DIA' / 'BAT')
9	1C	28	7	A	Task category
10	23	35	1	–	– reserved –

Length of job definition extension: 36 bytes

Note

1) In accordance with the last valid specification for the START operand in the ENTER-JOB, ENTER-PROCEDURE or MODIFY-JOB command, the following values are entered here:

START operand	Output in field 6
STD	' STANDARD '
SOON	' SOON '
IMMEDIATELY	' IMMED '
BY-OPERATOR	' BYOPER '
BY-USER	' BYUSER '
WITHIN(HOURS=hh,MINUTES=mm)	' WITHIN hhmm'
AT(DATE=yymmdd,TIME=hh:mm)	' Ayymmddhhmm'
EARLIEST(DATE=yymmdd,TIME=hh:mm)	' Eyymmddhhmm'
LATEST(DATE=yymmdd,TIME=hh:mm)	' Lyymmddhhmm'
AT-STREAM-STARTUP	' ATLOAD '

Extension 3: Job resource requests

This record extension is a structure field extension comprising one element.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "JR"
2	02	2	1	B	Number of elements(X'01')
3	03	3	1	B	Element length (X'0C')
4	04	4	4	B/A	Specified CPU time limit (binary or ' NTL ')
5	08	8	4	B/A	Specified PRINT limit (binary or ' NLL ')
6	0C	12	4	B/A	Specified PUNCH limit (binary or ' NCL ')

Length of resource request extension: 16 bytes

Extension 4: Job parameter

This record extension is a character string extension containing an installation-dependent job parameter which is only interpreted when an individual job scheduler is used.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "JP"
2	02	2	1	B	X'00'
3	03	3	1	B	Length L of job parameter [1]
4	04	4	L	C	Job parameter [2]

Length of job parameter extension: L+4 bytes

Notes

1) The maximum length of the job parameter is 128 bytes.

2) If the JOB-PARAMETER operand is omitted in the SET-LOGON-PARAMETERS, ENTER-JOB, ENTER-PROCEDURE or MODIFY-JOB command, then field 3 is assigned the length 0 and field 4 is omitted.
   This enables an analysis program to ascertain whether the job parameter extension has been deactivated or whether the user omitted the job parameter.

3.1.2   TASK – Task accounting record

The task accounting record is written during LOGOFF processing or on abnormal termination of a user task.

Maximum length of the task accounting record: 400 bytes

(A) Record definition: record ID "TASK"

(B) Identification section: User identification

(C) Basic information

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	6	Z	Date of job start [1]
2	06	6	6	Z	Time of job start [2]
3	0C	12	6	Z	Date of task termination
4	12	18	6	Z	Time of task termination
5	18	24	4+4	B2	Task CPU time [3]
6	20	32	4	B	Number of inputs/outputs [4]
7	24	36	4	B	Volume of data transferred [5]
8	28	40	8	B	Main memory allocation integral [6]
9	30	48	8	B	Resident memory pool integral [7]
10	38	56	4	B	Number of paging operations [8]
11	3C	60	1	B	Task scheduling priority
12	3D	61	3	A	Task scheduling attribute ('TP' / 'DIA' / 'BAT')
13	40	64	4	B	SECURE and MOUNT waiting time [9]
14	44	68	7	A	Task category
15	4B	75	1	–	– reserved –
16	4C	76	2	Z	Century of job start [10]
17	4E	78	2	Z	Century of job termination [10]
18	50	80	8	B	Vector pages integral [11]
19	58	88	8	B	Resident DATA SPACE integral [12]
20	60	96	1	C	Season ID for job start [13]
21	61	97	1	C	Season ID for job termination [13]
22	62	98	2	–	– reserved –
23	64	100	4+4	B2	Standardized CPU time [14]
24	6C	108	4+4	B2	/390 mode time [14]

Length of basic information: 116 bytes

Notes

1) Date in the form `yymmdd`.

2) Time in the form `hhmmss`.

3) The task CPU time comprises the CPU time used by user programs in the TU state as well as the CPU time used in the TPR state for the processing of SVCs, program errors and commands. The first word contains full seconds, the second word contains the remaining fraction in nanoseconds.

4) This refers to inputs/outputs to local peripherals, provided they are supported by the DMS access methods (SAM, ISAM, UPAM, BTAM, PPAM), by the SYSFILE management (SYSDTA on floppy disk, SYSOPT on floppy disk) or by the ADAM device access method. Not included are terminal and paging I/Os.

5) This counter stores the total amount of data transferred for all those devices for which I/O operations are counted (in units of "number of bytes / 2048", i.e. one PAM block in the case of disks).

6) The main memory allocation integral is measured in units of Kbytes * seconds, based on the task CPU time.

7) Sum of the allocation integrals of the resident Common Memory Pools connected to the task, in units of Kbytes * seconds.

8) Number of memory pages read in by paging.

9) Time in seconds (real time) for which a task had to wait for the execution of SECURE or MOUNT.

10) E.g. the string "19" to indicate the year 1999.

11) The sum of the number of vector pages occupied (in the case of a vector processor), in units of Kbytes * seconds.

12) The sum of the number of DATA SPACES occupied, in units of Kbytes * seconds. A DATA SPACE is a special virtual address space containing exclusively data which can be addressed and processed using its own addressing mode.

13) „S" for standard time (summer); "W" for daylight saving time (winter).

14) The fields contain the same values as field 5.

(D) Variable information

The variable information of the task accounting record contains seven record extensions.

Length of extension header: 16 bytes

Extension 1: Task termination cause

This record extension is a structure field extension comprising one element.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "TT"
2	02	2	1	B	Number of elements (X'01')
3	03	3	1	B	Element length (X'0C')
4	04	4	2	A	Termination indicator
					'T' = normal termination
					'A' = abnormal termination
5	06	6	1	A	Termination unit (here always' T' = task)
6	07	7	1	A	Termination request[1]
					'C' = by user command
					'E' = by user task error
					'$' = by hardware or system error
					'X' = external (by command CANCEL-JOB or by SHUTDOWN)
7	08	8	7	A/C	Termination code [1]
8	0F	15	1	–	– reserved –

Length of task termination extension: 16 bytes

Note

1)

Termination request	Termination code
'C'	'LOGOFF' = EXIT-JOB or LOGOFF by the user
	'ABEND' = EXIT-JOB MODE=*ABNORMAL by the user
'E' and '$'	DMS error code
'X'	'CANU' = CANCEL-JOB by user
	'CANS' = CANCEL-JOB by systems support
	'CANO' = CANCEL-JOB by operator
	'CAN-R' = CANCEL-JOB from remote server within MRS network
	'POSIX' = END OF POSIX SUBTASK in a MRS network
	'SHUT' = SHUTDOWN by operator

Extension 2: Background storage allocation

This record extension is a structure field extension comprising one element.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "MA"
2	02	2	1	B	Number of elements (X'01')
3	03	3	1	B	Element length (X'30')
4	04	4	8	–	– reserved –
5	0C	12	8	B	Total class 5 and class 6 memory allocation [1]
6	14	20	8	B	Common memory pool integral [2]
7	1C	28	8	B	EAM memory allocation [3]
8	24	36	8	B	– reserved –
9	2C	44	8	B	DATA-SPACE integral [4]

Length of background storage extension: 52 bytes

Notes

1) Integral of the class 5 and class 6 working storage size over the runtime, without local memory pools or vector processor pages (class 6 memory).

2) Sum of the allocation integrals of all pageable memory pools connected to the task in class 5 and class 6 memory.

3) Sum of the allocation integrals of all EAM files generated by the task; all integrals are measured in units of Kbytes * seconds, based on residence time.

4) Sum of the allocation integrals of all the DATA-SPACE files generated by the task.
A DATA SPACE is a special virtual address space containing exclusively data which can be addressed and processed using its own addressing mode.

Extension 3: Inputs/outputs and volume of data per device group

This record extension is a structure field extension comprising two elements.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "IO"
2	02	2	1	B	Number of elements (X'02')
3	03	3	1	B	Element length (X'14')
4	04	4	20	*	1st element: number of I/Os per device group [1]
5	18	24	20	*	2nd element: volume of data transferred per device group [2]

Length of device group I/O extension: 44 bytes

Notes

1) The number of I/O operations, contained in field 6 of the basic information, is broken down for the various device groups here.

2) The volume of data, indicated in field 7 of the basic information, is broken down for the various device groups here.

Format and contents of a device group element

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	+00	+0	4	B	for public volume sets
2	+04	+4	4	B	for shareable private disks
3	+08	+8	4	B	for exclusive private disks
4	+0C	+12	4	B	for magnetic tapes
5	+10	+16	4	B	for unit-record devices

Length of a device group element: 20 bytes

Extension 4: Terminal inputs/outputs

This record extension is a structure field extension comprising one element; it is generated by interactive tasks only.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "TI"
2	02	2	1	B	Number of elements (X'01')
3	03	3	1	B	Element length (X'10')
4	04	4	4	B	Number of terminal I/Os (low) [1]
5	08	8	4	B	Number of bytes transferred to/from the terminal (low) [2]
6	0C	12	4	B	Number of terminal I/Os (high) [3]
7	10	16	4	B	Number of bytes transferred to/from the terminal (high) [4]

Length of terminal I/O extension: 20 bytes

Notes

1) Sum of all messages (or transactions) received by and transmitted from the terminal with the value $\leq 2^{31}$.

2) Sum of all bytes received by and transmitted from the terminal in messages with the value $\leq 2^{31}$.

3) Sum of all messages (or transactions) received by and transmitted from the terminal with the value modulo 2^{31}. The total number of messages is deduced from the value: field 4 + (field 6 * (2^{31})).

4) Sum of all bytes received by and transmitted from the terminal in messages with the value modulo 2^{31}. The total number of bytes is deduced from the value: field 5 + (field 7 * (2^{31})).

Extension 5: Number of catalog accesses

This record extension is a structure field extension comprising one element.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "CA"
2	02	2	1	B	Number of elements (X'01')
3	03	3	1	B	Element length (X'10')
4	04	4	4	B	Number of catalog accesses to local files [1] [2]
5	08	8	4	B	Number of catalog accesses to local job variables [2]
6	0C	12	4	B	Number of catalog accesses to remote files [3]
7	10	16	4	B	Number of catalog accesses to remote job variables [3]

Length of catalog access extension: 20 bytes

Notes

1) This is the number of catalog entries read or written by the user task.

2) Counts all catalog accesses to files or job variables cataloged on locally imported public volume sets, including the home pubset.

3) Counts all catalog accesses to files or job variables cataloged on remotely imported pubsets and accessed within the server network via RCA (Remote Catalog Access). File accesses using RFA (Remote File Access) are not counted.

Extension 6: Performance controller data

This record extension is a structure field extension comprising one element.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "PC"
2	02	2	1	B	Number of elements (X'01')
3	03	3	1	B	Element length (X'24')
4	04	4	4	B	Maximum dynamic SERVICE-RATE request [1]
5	08	8	4	B	Specified SERVICE-UNITS (low) [2]
6	0C	12	4	B	Specified CPU SUs (low) [2]
7	10	16	4	B	Specified IO SUs (low) [2]
8	14	20	4	B	Specified MEMORY SUs (low) [2]
9	18	24	4	B	Specified SERVICE-UNITS (high) [2]
10	1C	28	4	B	Specified CPU-SU (high) [2]
11	20	32	4	B	Specified IO-SU (high) [2]
12	24	36	4	B	Specified MEMORY-SU (high) [2]
13	28	40	4+4	B	Standardized CPU-SU [3]
14	30	48	4+4	B	Standardized SERVICE-UNITS [4]

Length of performance controller extension: 56 bytes

Notes

1) For an explanation of the information output, see the "PCS" manual [5].

2) Fields 5,6,7,8 contain the values for SERVICE-UNITS $\leq 2^{31}$.
   Fields 9,10,11,12 contain the values for SERVICE-UNITS with the value:
       modulo 2^{31}.
   The total number of SERVICE-UNITS is deduced from the value:
       field 5 + (field 9 * (2^{31})).
   The total number of CPU-SERVICE-UNITS is deduced from the value:
       field 6 + (field 10 *(2^{31})).
   The total number of IO-SERVICE-UNITS is deduced from the value:
       field 7 + (field 11 * (2^{31})).
   The total number of MEMORY-SERVICE-UNITS is deduced from the value:
       field 8 (field 12 *(2^{31})).

3) This value corresponds to the CPU-SU value in fields 10 and 6.

4) This value is the same as the total number of SERVICE UNITS from fields 9 and 5.

Extension 7: Account ID

This record extension is a character-string extension.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "ID"
2	02	2	1	B	X'00'
3	03	3	1	B	Length L of the account ID
4	04	4	L	C/X	Account ID [1]

Maximum length of user ID extension: 12 bytes

Note

1) The account ID, whose maximum permissible length is 8 bytes, tallies with the ID as entered by the user either by means of the WRITE-ACCOUNTING-RECORD command (USER-ACCOUNTING-STEP operand) or by means of the AREC macro (ID operand). If no ID has so far been specified for the given job run, then the field is filled with X'FFFFFFFFFFFFFFFF'.

3.1.3   PRGS – Program start accounting record

The program start accounting record is written after completion of a program loading operation, i.e. prior to program execution. Essentially this record covers the same parameters as the task accounting record.

The following should be noted for a better understanding of the subsequent information:

- If the use of resources increases steadily, the current status in relation to the task start is recorded (ledger mark V).

- Variable parameters such as the task scheduling priority or the task scheduling attribute are assigned the maximum value M since the most recent program start/termination record or since the task start.

Maximum length of the program start accounting record: 476 bytes

(A) Record definition: record ID "PRGS"

(B) Identification section: user identification

(C) Basic information

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	6	Z	Date of job start [1]
2	06	6	6	Z	Time of job start [2]
3	0C	12	6	Z	Date of program start [1]
4	12	18	6	Z	Time of program start [2]
5	18	24	4+4	B2	Task CPU time (L)
6	20	32	4	B	Number of inputs/outputs (L)
7	24	36	4	B	Volume of data transferred (L)
8	28	40	8	B	Main memory occupancy integral (L)
9	30	48	8	B	Resident memory pool integral
10	38	56	4	B	Number of paging operations (L)
11	3C	60	1	B	Task scheduling priority (M)
12	3D	61	3	A	Task scheduling attribute (M) ('TP' / 'DIA' / 'BAT')
13	40	64	4	B	SECURE and MOUNT waiting time (L)
14	44	68	7	A	Task category
15	4B	75	1	–	– reserved –
16	4C	76	2	Z	Century of job start
17	4E	78	2	Z	Century of job termination
18	50	80	8	B	Vector pages integral
19	58	88	8	B	Resident DATA-SPACE integral
20	60	96	1	C	Season ID for job start [3]
21	61	97	1	C	Season ID for program start [3]
22	62	98	2	–	– reserved –
23	64	100	4+4	B2	Standardized CPU time [4]
24	6C	108	4+4	B2	/390 mode time

Length of basic information: 116 bytes

Key
> L = ledger mark
> M = maximum interval

Notes

1) Date in the form `yymmdd`.

2) Time in the form `hhmmss`.
3) "S" for standard time (summer); "W" for daylight saving time (winter).

4) This value corresponds to the Task CPU time value in field 5.

   For the meaning of fields 4 through 19, see the notes under the basic information of the task accounting record.

(D) Variable information

The variable information of the program start accounting record contains seven record extensions.

Length of extension header: 16 bytes

Extension 1: Internal program name

This record extension is a character string extension.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "PN"
2	02	2	1	B	X'00'
3	03	3	1	B	Length of PN extension
4	04	4	1	C	Program origin indicator:
					'*' = Object module from SYSEAM
					'L' = Load module from a load module file
					'O' = Object module from an OML or PLAM
					'S' = Shared code product
5	05	5	1	A	RESTART indicator
					'R' for RESTART command
					'F' for child processes (POSIX)
					' ' other
6	06	6	1	C	Additional information on source of program:
					' ' = Object module from OML
					'R' = Object module from PLAM
					'C' = Phase from a PLAM
					'L' = LLM from PLAM
					'U' = undefined
7	07	7	8	–	– reserved –
8	0F	15	1	B	Length V of the program version (V= 1..24)
9	10	16	10	C	Program version (10 characters)
10	1A	26	1	B	Length P of the program name (P= 1..41)
11	1B	27	P	F	Program or module name
12	1B+P	27+P	V	F	Program version (complete)

Maximum length of program name extension: 92 bytes

Note

As of BS2000/OSD-BC V1.0 the program version may be 24 characters long. Field 9 contains the first 10 characters of the program version, field 12 contains the complete program version. If the length of the program version is < 11 characters, fields 9 and 12 will match.

Extension 2: Background storage allocation

Format and contents of this extension correspond to the relevant extension of the task accounting record.
All utilization parameters recorded are ledger marks.

Extension 3: Inputs/outputs and volume of data per device group

Format and contents of this extension correspond to the relevant extension of the task accounting record.
All utilization parameters recorded are ledger marks.

Extension 4: Terminal inputs/outputs

Format and contents of this extension correspond to the relevant extension of the task accounting record.
All utilization parameters recorded are ledger marks.

Extension 5: Number of catalog accesses

Format and contents of this extension correspond to the relevant extension of the task accounting record.
All utilization parameters recorded are ledger marks.

Extension 6: Performance controller data

Format and contents of this extension correspond to the relevant extension of the task accounting record.
All utilization parameters recorded are ledger marks.

Extension 7: Account ID

Format and contents of this extension correspond to the relevant extension of the task accounting record.

3.1.4 PRGT – Program termination accounting record

The program termination accounting record is written at normal or abnormal program termination; it covers essentially the same parameters as the task accounting record (see the fields of the program start accounting record PRGS).

Maximum length of the program termination accounting record: 528 bytes

(A) Record definition: record ID "PRGT"

(B) Identification section: user identification

(C) Basic information

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	6	Z	Date of job start (LOGON) [1]
2	06	6	6	Z	Time of job start [2]
3	0C	12	6	Z	Date of program termination [1]
4	12	18	6	Z	Time of program termination [2]
5	18	24	4+4	B2	Task CPU time (L)
6	20	32	4	B	Number of inputs/outputs (L)
7	24	36	4	B	Volume of data transferred (L)
8	28	40	8	B	Main memory occupancy integral (L)
9	30	48	8	B	Resident memory pool integral
10	38	56	4	B	Number of paging operations (L)
11	3C	60	1	B	Task scheduling priority (M)
12	3D	61	3	A	Task scheduling attribute (M) ('TP' / 'DIA' / 'BAT')
13	40	64	4	B	SECURE and MOUNT waiting time (L)
14	44	68	7	A	Task category
15	4B	75	1	–	– reserved –
16	4C	76	2	Z	Century of job start
17	4E	78	2	Z	Century of program termination
18	50	80	8	B	Vector pages integral
19	58	88	8	B	Resident DATA-SPACE integral
20	60	96	1	C	Season ID for job start [3]
21	61	97	1	C	Season ID for program termination [3]
22	62	98	2	–	– reserved –
23	64	100	4+4	B2	Standardized CPU time [4]
24	6C	108	4+4	B2	/390 mode time

Length of basic information: 116 bytes

Key

L = ledger mark
M = maximum interval

Notes

1) Date in the form `yymmdd`.

2) Time in the form `hhmmss`.

3) "S" for standard time (summer); "W" for daylight saving time (winter).

4) This value corresponds to the Task CPU time value in field 5.

   For the meaning of fields 4 through 19, see the notes under the basic information of the task accounting record.

(D) Variable information

The variable information of the program termination accounting record contains eight record extensions. Length of extension header: 18 bytes

Extension 1: Program termination cause

This record extension is a structure field extension comprising one element.

Field number	Displacement hex	Displacement dec	Length (bytes)	Format	Meaning
1	00	0	2	A	Extension identifier "PT"
2	02	2	1	B	Number of elements (X'01')
3	03	3	1	B	Element length (X'0C')
4	04	4	2	A	Termination indicator [1]
					'T' = normal termination
					'A' = abnormal termination
5	06	6	1	A	Termination unit [2]
					'P' = Program
					'S' = Step
					'T' = Task
6	07	7	1	A	Termination request [3]
					'P' = by program
					'C' = by user command
					'E' = by user task error
					'$' = by hardware or system error
					'X' = external (by the command CANCEL-JOB or SHUTDOWN)
7	08	8	7	A/C	Termination code [3]
8	0F	15	1	–	– reserved –

Length of program termination extension: 16 bytes

Notes

1) The termination indicator corresponds to the possible contents of the job variable for program monitoring.

2) This shows whether
   – the program was terminated (P).
   – a procedure step was terminated at the same time (S).
   – the task was terminated (T).

3)

Termination request	Termination code
'C'	'EXECUTE' = START-(EXECUTABLE-)PROGRAM by the user 'LOGOFF' = EXIT-JOB or LOGOFF by the user 'ABEND' = EXIT-JOB MODE=*ABNORMAL by the user
'E' and '$'	Name of command (LOGOFF, ABEND and EXECUTE)
'X'	DMS error code 'CANU' = CANCEL-JOB by the user 'CANS' = CANCEL-JOB by the systems support 'CANO' = CANCEL-JOB by the operator 'CAN-R' = CANCEL-JOB by another server in the MRS network
'P'	'SHUT' = SHUTDOWN by the operator 7 blanks

Extension 2: Background storage allocation

Format and contents of this extension correspond to the relevant extension of the task accounting record.
All utilization parameters recorded are ledger marks.

Extension 3: Inputs/outputs and volume of data per device group

Format and contents of this extension correspond to the relevant extension of the task accounting record.
All utilization parameters recorded are ledger marks.

Extension 4: Terminal inputs/outputs

Format and contents of this extension correspond to the relevant extension of the task accounting record.
All utilization parameters recorded are ledger marks.

Extension 5: Number of catalog accesses

Format and contents of this extension correspond to the relevant extension of the task accounting record.
All utilization parameters recorded are ledger marks.

Extension 6: Performance controller data

Format and contents of this extension correspond to the relevant extension of the task
accounting record.
All utilization parameters recorded are ledger marks.

Extension 7: External program identification

This record extension is a string extension.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "EI"
2	02	2	1	B	X'00'
3	03	3	1	B	Length L of extension
4	04	4	1	B	Length L1 of file name
5	05	5	1	B	Length L2 of element name
6	06	6	1	B	Length L3 of element version
7	07	7	1	B	Length L4 of element type
8	08	8	L1	F/C	File name [1]
9	D1	D1	L2	F/C	Element name [2]
10	D2	D2	L3	F/C	Element version [3]
11	D3	D3	L4	F/C	Element type [4]

Maximum length of file name extension: 158 bytes

Notes

1) Name of load module file, PLAM library or object module library. In the case of object
    modules loaded from the SYSEAM file or as a shareable program, this field contains
    "*EAM-OMF" or "*SHARED-CODE". The maximum length of the file name is 54 bytes.

2) Name of the element in the PLAM library. Displacement is 8+L1, the maximum length
    for element names is 64 bytes.

3) Version of the element in the PLAM library. Displacement D2: 8 + L1 + L+2;
    maximum length of L3: 24 bytes.

4) Type of element in the PLAM library. Displacement D3: 8 + L1 + L2 + L3;
    maximum length of L4 : 8 bytes.

Extension 8: Account ID

Format and contents of this extension correspond to the relevant extension of the task
accounting record.

3.1.5 PACC – Periodic program accounting record

The following conditions must be met for period recording of program accounting records:

- The task in question must belong to a monitored job class when a program is loaded.

- At the time of checking a program must be loaded and the PACC record must be activated

- A defined period has elapsed since the start of the program or since the previous PACC record was written.

The record essentially contains the same parameters as the task accounting record.

Maximum length of the periodic program accounting record: 402 bytes

(A) Record definition: record ID "PACC"

(B) Identification section: user identification

(C) Basic information

Field number	Displacement		Length	Format	Meaning
	hex	dec	(bytes)		
1	00	0	6	Z	Date of the job start (/SET-LOGON-PARAMETERS) [1]
2	06	6	6	Z	Time of the job start [2]
3	0C	12	6	Z	Date of recording [1]
4	12	18	6	Z	Time of recording [2]
5	18	24	4+4	B2	Task CPU time (L)
6	20	32	4	B	Number of I/Os (L)
7	24	36	4	B	Volume of data transferred (L)
8	28	40	8	B	Main memory allocation integral (L)
9	30	48	8	B	Resident memory pool integral
10	38	56	4	B	Number of paging operations (L)
11	3C	60	1	B	Task scheduling priority (M)
12	3D	61	3	A	Task scheduling attribute (M) ('TP' / 'DIA' / 'BAT')
13	40	64	4	B	SECURE and mounting wait time (L)
14	44	68	7	A	Task category
15	4B	75	1	–	– reserved –
16	4C	76	2	Z	Century of job start
17	4E	78	2	Z	Century of program entry
18	50	80	8	B	Vector pages integral
19	58	88	8	B	Resident DATA-SPACE integral
20	60	96	1	C	Season ID for job start [3]
21	61	97	1	C	Season ID for writing this record [3]
22	62	98	2	–	– reserved –
23	64	100	4+4	B2	Standardized CPU time [4]
24	6C	108	4+4	B2	/390 mode time

Length of basic information: 116 bytes

Key
   L= ledger mark
   M = maximum interval

Notes

1) Date in the form `yymmdd`.

2) Time in the form `hhmmss`.

3) "S" for standard time (summer); "W" for daylight saving time (winter).

4) This value corresponds to the Task CPU time value in field 5.

   For the meanings of fields 5 to 19 see the notes on the basic information of the task accounting record**.**

(D) Variable information

The variable information of the program termination accounting record contains seven record extensions. Length of the extension header: 16 bytes

Extension 1: Time of previous PACC record

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifer "PD"
2	02	2	1	B	Number of elements (X'01')
3	03	3	1	B	Element length (X'10')
4	04	4	6	Z	Date [1]
5	0A	10	6	Z	Time [2] — of the previous
6	10	16	2	Z	Century [3] — PACC record
7	12	18	1	C	Season [4]
8	13	19	1	–	– reserved –

Length of time extension: 20 bytes

Notes

1) Date in the form `yymmdd`.

2) Time in the form `hhmmss`.

3) E.g. the string "19" to indicate the year 1999.

4) "S" for standard time (summer); "W" for daylight saving time (winter).

The first PACC record of a task contains blanks in the fields of the first extension.

Extension 2: Background buffer allocation

Format and contents of this extension correspond to the relevant extension of the task accounting record.
All utilization parameters recorded are ledger marks.

Extension 3: Inputs/outputs and data volume per device group

Format and contents of this extension correspond to the relevant extension of the task accounting record.
All utilization parameters recorded are ledger marks.

Extension 4: Terminal inputs/outputs

Format and contents of this extension correspond to the relevant extension of the task accounting record.
All utilization parameters recorded are ledger marks.

Extension 5: Number of catalog accesses

Format and contents of this extension correspond to the relevant extension of the task accounting record.
All utilization parameters recorded are ledger marks.

Extension 6: Performance controller data

Format and contents of this extension correspond to the relevant extension of the task accounting record.
All utilization parameters recorded are ledger marks.

Extension 7: Account ID

Format and contents of this extension correspond to the relevant extension of the task accounting record.

3.1.6   PDMP – User dump accounting record

This accounting record is written after output of a user program dump or a user task dump.

(No accounting record is generated for a system dump.)

Maximum length of the user dump accounting record: 78 bytes

(A) Record definition: record ID "PDMP"

(B) Identification section: user identification

(C) Basic information

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	6	Z	Date of dump start [1]
2	06	6	6	Z	Time of dump start [2]
3	0C	12	6	Z	Date of dump end [1]
4	12	18	6	Z	Time of dump end [2]
5	18	24	4	B	Number of main memory pages output
6	1C	28	4	C	TSN of dump task
7	20	32	4	C	TSN of affected task

Length of basic information: 36 bytes

Notes

1)   Date in form `yymmdd`.

2)   Time in form `hhmmss`.

(D) Variable information

The variable information of the user dump accounting record contains no record extensions.

Length of variable record section: 2 bytes

3.1.7 SPLO – Spoolout accounting record

The SPOOLOUT accounting record is written on termination of a spoolout job.

Maximum length of the SPOOLOUT accounting record: 474 bytes

(A) Record definition: record ID "SPLO"

(B) Identification section: user ID

(C) Basic information

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	6	Z	Date of spoolout start [1]
2	06	6	6	Z	Time of spoolout start [2]
3	0C	12	6	Z	Date of spoolout end [1]
4	12	18	6	Z	Time of spoolout end [2]
5	18	24	8	A	Spoolout job name (PRINT-JOB-NAME)
6	20	32	4	–	– reserved –
7	24	36	2	B	Number of copies to be output
8	26	38	1	B	Spoolout class
9	27	39	1	B	Spoolout scheduling priority
10	28	40	3	C	Type of spoolout file [3]
11	2B	43	1	–	– reserved –
12	2C	44	2	Z	Century [4]
13	2E	46	1	A	Season ID for spoolout start [5]
14	2F	47	1	A	Season ID for spoolout end [5]
15	30	48	2	Z	Century for spoolout end [4]
16	32	50	4	Z	TSN of the partner print job [6]

Length of basic information: 48 bytes

General note

The job number of the spoolout job is not output; the corresponding file remains reserved.

Notes

1) Date in the form `yymmdd`.

2) Time in the form `hhmmss`.

3) The following displays are possible:

    'SYS' = logical system files (SYSLST, SYSOUT, SYSOPT)
    'OMF' = EAM object module file
    'EAM' = User EAM file
    'PLM' = PLAM library element
    '   '   = other file
    'TMP' = temporary file

4) E.g. the string "19" to indicate the year 1999.

5) "S" for standard time (summer); "W" for daylight saving time (winter).

6) There are two different cases for this TSN:
 – If the print job was issued from a remote server and is being processed on the local server, this is the TSN on the client or gateway server.
 – If the print job was issued on the local server and is being processed on the local server, this is the same TSN as the print job.

(D) Variable information

The variable information of the SPOOLOUT accounting record contains six record extensions.

Length of extension header: 16 bytes

Extension 1: Spoolout termination cause

This record extension is a structure field extension comprising one element.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "OT"
2	02	2	1	B	Number of elements (X'01')
3	03	3	1	B	Element length (X'0C')
4	04	4	2	A	Termination indicator
					'T' = normal termination
					'A' = abnormal termination
5	06	6	1	–	– reserved –
6	07	7	1	A	Termination request [1]
7	08	8	7	A/C	Termination code [1]
8	0F	15	1	–	– reserved –

Length of spoolout termination extension: 16 bytes

Note

1)

Termination request	Termination code
'F' 'E' '$' 'X'	NORM = normal termination DMS = error during reading of file I/O = input/output error on output device CAN = termination by CANCEL-PRINT-JOB or CANCEL-JOB

Extension 2: Spoolout creation

This extension is a structure field extension comprising one element.

Field number	Displacement		Length	Format	Meaning
	hex	dec	(bytes)		
1	00	0	2	A	Extension identifier "OC"
2	02	2	1	B	Number of elements (X'01')
3	03	3	1	B	Element length (X'1D')
4	04	4	4	C	TSN of creating task
5	08	8	2	–	– reserved –
6	0A	10	12	Z	Date and time of spoolout job creation
7	18	22	2	Z	Century of date
8	1A	24	8	A	Original user ID (for replay jobs)
9	20	32	1	A	Season ID for spoolout start

Length of spoolout creation extension: 33 bytes

Extension 3: Spoolout initiation

This extension is a case distinction extension. It is present only if the spoolout operation was triggered by way of the HOLD-PRINT-JOB command (RESUME-CONDITION operand).

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "OI"
2	02	2	1	B	Number of elements (X'01')
3	03	3	1	B	Element length (X'13')
4	04	4	2	A	Case identifier "RE"
5	06	6	2	–	– reserved –
6	08	8	12	–	– reserved –
7	14	20	2	–	– reserved –
8	16	22	1	–	– reserved –

Length of HOLD-PRINT-JOB command extension: 23 bytes

Extension 4: Spoolout input tape

This extension is a structure field extension comprising one element. It is generated only if the output file was read from a user tape or replay tape.

A user tape is generated using the WRITE-SPOOL-TAPE command.

A replay tape is a tape which is assigned for spoolout/spoolin by the operator or systems support using the START-TAPE-OUTPUT command.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "IN"
2	02	2	1	B	Number of elements (X'01')
3	03	3	1	B	Element length (X'14')
4	04	4	2	–	– reserved –
5	06	6	2	A	Mnemonic name of tape device
6	08	8	8	–	– reserved –
7	10	16	6	–	– reserved –
8	16	22	2	–	– reserved –

Length of spoolout input tape extension: 24 bytes

Extension 5: Output medium

This extension is a case distinction extension. The associated extension identifier is always "OM". Format and contents depend on the case identifier, which also indicates in which manner spoolout has taken place.

a) Line printer extension
The spoolout file was printed on a SPOOL or RSO line printer.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "OM"
2	02	2	1	B	Number of elements (X'01')
3	03	3	1	B	Element length (X'20')
4	04	4	2	A	Case identifier " "
5	06	6	2	A	Mnemonic name of printer
6	08	8	4	B	Number of printed lines [1]
7	0C	12	4	B	Number of printed pages [1]
8	10	16	8	A	Device name
9	18	24	6	A	FORM name
10	1E	30	2	–	– reserved –
11	20	32	3	–	– reserved –
12	23	35	1	B	Component identifier [2]

Length of line printer extension: 36 bytes

Notes

1) The values for printed lines/pages cannot be guaranteed during spoolout in the event of printer problems, As far as 3365 Printers in particular are concerned, the values are invalid in the following cases:
   – control characters in the input file,
   – additional data passed to the printer via the PCL file,
   – expanded mode is set to "ON",
   – PCL sends special options to the printer (e.g. more than one logical page per physical page).

   Generally speaking, it is also important that in all cases in which the printer does not behave like a line printer, the number of pages and lines cannot be complemented correctly.

2) Identifies whether output was on a local printer via a channel trunk or on an RSO printer via a data-transmission link.
Permissible values:
- X'01' for local printers via channel trunk.
- X'02' for RSO printers via telecommunication link.
- X'03' for printers on a bus channel.
- X'05' for DPRINT jobs within clusters for local printers.
- X'15' for DPRINT jobs between clusters for local printers.
- X'16' for DPRINT jobs between clusters for RSO printers.

b) APA page printer extension
The spoolout file was printed on an APA page printer.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "OM"
2	02	2	1	B	Number of elements (X'01')
3	03	3	1	B	Element length (X'50')
4	04	4	2	A	Case identifier "AP"
5	06	6	2	A	Mnemonic device name
6	08	8	4	–	– reserved –
7	0C	12	4	–	– reserved –
8	10	16	8	A	Device name
9	18	24	6	A	FORM name
10	1E	30	2	–	– reserved –
11	20	32	3	–	– reserved –
12	23	35	1	B	Device access [1]
13	24	36	4	B	# of xmits for the pds.
14	28	40	4	B	Number of pages printed
15	2C	44	4	B	# of printed pages-side
16	30	48	4	B	Time used (.01 sec.)
17	34	52	4	B	Number of requested PAGEDEF
18	38	56	4	B	Number of requested FORMDEF
19	3C	60	4	B	Number of requested FONTS
20	40	64	4	B	Number of FONTS loaded
21	44	68	4	B	Number of requested overlays
22	48	72	4	B	Number of overlays loaded
23	4C	76	4	B	Size of pages used
24	50	80	1	B	Input bin flag
25	51	81	1	B	Output bin flag
26	52	82	1	B	Duplex flag
27	53	83	1	–	– reserved –

Length of APA extension: 84 bytes

Note

1) This field indicates whether the print job is local or distributed, i.e. whether the devices are accessed via a channel or the network.
   Permissible values:
   – X'01' for a local printer via a channel.
   – X'05' Dprint print jobs within a cluster for local printers.
   – X'05' Dprint print jobs between clusters for local printers.

c) SCSIPCL printer extension

 The spoolout file was printed on an SCSIPCL printer.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "OM"
2	02	2	1	B	Number of elements (X'01')
3	03	3	1	B	Element length (X'3E')
4	04	4	2	A	Case identifier "SC"
5	06	6	2	A	Mnemonic device name
6	08	8	4	B	– reserved –
7	0C	12	4	B	– reserved –
8	10	16	8	A	Device name
9	18	24	6	A	FORM name
10	1E	30	2	–	– reserved –
11	20	32	3	–	– reserved –
12	23	35	1	B	Device access [1]
13	24	36	4	–	– reserved –
14	28	40	4	B	Number of pages printed [2]
15	2C	44	4	B	# of printed pages-side [3]
16	30	48	1	B	Input bin flag [4]
17	31	49	17	–	– reserved –

Length of the SCSIPCL extension: 36 bytes

Notes

1) This field indicates whether the print job is local or distributed, i.e. whether the devices are accessed via a channel or the network.
   Permissible values:
   – X'01' for a local printer via a channel.
   – X'05' Dprint print jobs within a cluster for local printers.
   – X'05' Dprint print jobs between clusters for local printers.

2) The accuracy of this value cannot be guaranteed. This applies particularly when errors occur during processing of the print job.

3) This value is valid only for a print command issued with the parameter DOCUMENT-FORMAT=*TEXT.

4) Reference to the input bin, as specified in the print command.
   Permissible values:
   X'01' to X'63'   Possible number of an input bin
   X'81'   Input bin with paper format A3
   X'82'   Input bin with paper format A4
   X'8A'   Input bin with paper format LEGAL
   X'8B'   Input bin with paper format LETTER
   X'90'   Input bin with paper format A3-UNCUT
   X'91'   Input bin with paper format A4-UNCUT
   X'92'   Input bin with paper format LEDGER

   This value does not apply if the printer could not find the specified input bin. In this case, a predefined input bin is selected.

   The input bin in the print file can be switched by means of DOCUMENT-FORMAT= *SPECIAL-FORMAT(FORMAT-NAME=*PCL).

Extension 6: Spoolout file name

This extension is a character string extension.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "FN"
2	02	2	1	B	X'00'
3	03	3	1	B	File name length
4	04	4	54	F/Z	Name of spoolout file [1]
5	3A	58	64	F/Z	Element name
6	7A	122	24	C	Element version
7	92	146	8	C	Element type
8	9A	154	2	C	Number of records [2]

Maximum length of file name extension: 156 bytes

Notes

1) File name of the PLAM library according to the spoolout report. For object modules from the SYSEAM file, this field contains "*EAM-OMF"; for other temporary files from SYSEAM, this field contains a ten-digit file number. For cataloged files, the file name from the PRINT-DOCUMENT command is output.

2) This field corresponds to the data in the PRINT-DOCUMENT command with respect to the number of pages to be printed.

General note

The TSN of the spoolout job is not output; field 3 therefore remains reserved.

Extension 7: Account ID

This record extension is a chain extension.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "ID"
2	02	2	1	B	X'00'
3	03	3	1	B	Length of the account ID
4	04	4	L	C/X	Account ID [1]

Maximum length of the user ID extension: 12 bytes

Note

1) The account ID (maximum permissible length: 8 bytes) matches the user ID specified by the user with the WRITE-ACCOUNTING-RECORD command (USER-ACCOUNTING-STEP operand) or the AREC macro (ID operand). If no user ID was specified during the job run, this field contains X'FFFFFFFFFFFFFFFF'.

3.1.8 TDEV – Device and volume accounting record

The device and volume accounting record is written when one or more devices and/or
volumes are released by a user task.

Maximum length of the device and volume accounting record: 492 bytes

(A) Record definition: record ID "TDEV"

(B) Identification section: user identification

(C) Basic information

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	6	Z	Date of release [1]
2	06	6	6	Z	Time of release [2]
3	0C	12	2	Z	Century of release [3]
4	0E	14	1	C	Season ID for release [4]
5	0F	15	1	–	– reserved –

Length of basic information: 16 bytes

Notes

1) Date in the form `yymmdd`. The time of release (end of occupancy) applies to all volumes
    and devices listed in the subsequent record extensions.

2) Time in the form `hhmmss`.

3) E.g. the string "19" to indicate the year 1999.

4) "S" for standard time (summer); "W" for daylight saving time (winter).

(D) Variable information

The variable information of the device and volume accounting record contains four record extensions.

Length of extension header: 10 bytes

Extension 1: Unit-record device allocation data

This extension is a structure field extension; it contains an entry for each unit-record device released at a given time.
Unit-record devices are all devices except tape and disk devices.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "DU"
2	02	2	1	B	Number of elements (K) [1]
3	03	3	1	B	Element length (X'28')
4	04	4	40	*	1st elem.: allocation data for 1st device [2]
:	:	:	:	:	:
K+3	(K-1)*40+4		40	*	K-th elem.: allocation data for k-th device

Length of unit-record device allocation extension: K*40+4 bytes

Notes

1) The number of elements is variable and depends on the number of devices released at the same time.

2) Format and contents of a device allocation element. The device allocation elements for unit-record devices (Extension 1) and volume devices (Extension 2) have the same structure.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	+00	+0	8	A	Device type [3]
2	+08	+8	4	B	Number of inputs/outputs
3	+0C	+12	4	B	Volume of data transferred [4]
4	+10	+16	12	Z	Date and time of start of occupancy
5	+1C	+28	1	A	Allocation type: [5]
					'E' = exclusive
					'S' = shareable
6	+1D	+29	1	–	– reserved –
7	+1E	+30	4	A	Mnemonic device name [6]
8	+22	+34	2	Z	Century (allocation start)
9	+24	+36	1	C	Season ID for allocation start [7]
10	+25	+37	3	–	– reserved –

Length of a device allocation element: 40 bytes

3) The permissible device types are defined by the BS2000 device management (see the device type code tables in the "System installation" manual [7]).

4) Number of transferred PAM blocks for disk devices, number of transferred 2 Kbytes for all other devices.

5) The allocation type distinction refers to volume devices only. Unit-record devices are always exclusive, i.e. only the entry "E" is possible for them.

6) Mnemonic name of the most recently allocated physical device. Since the length of the mnemonic name of the disk may be either 2 or 4 characters, in the first case 2 characters X'40' are appended to the field.

7) "S" for standard time (summer); "W" for daylight saving time (winter).

Extension 2: Volume-device allocation data

This extension is a structure field extension.

It contains an entry for each volume device released at a given time.
Volume devices are tape and disk devices. (Disk devices only with USE=SPECIAL allocation.)

A task may have worked successively on each physical device of this type, if the operator has set up the requested volumes on them. However, in the accounting record only one DP extension will be noted, with the total time the devices were occupied, and the last MN.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "DV"
2	02	2	1	B	Number of elements (K) [1]
3	03	3	1	B	Element length (X'28')
4	04	4	40	*	1st elem.: allocation data for 1st device [2]
:	:		:	:	:
K+3	(K-1)*40+4		40	*	K-th elem.: allocation data for k-th device

Length of volume-device allocation extension: (K*40+4) bytes

Notes

1) The number of elements is variable and depends on the number of devices released at the same time.

2) The device allocation elements for volume devices have the same format and contents as those for unit-record devices.

Extension 3: Volume allocation data

This extension is a structure field extension; it contains an entry for each volume released at a given time.

Field number	Displacement hex	Displacement dec	Length (bytes)	Format	Meaning
1	00	0	2	A	Extension identifier "VU"
2	02	2	1	B	Number of elements (K) [1]
3	03	3	1	B	Element length (X'28')
4	04	4	40	*	1st elem.: allocation data for 1st volume [2]
:	:	:	:	:	:
K+3	(K-1)*40+4		40	*	K-th element: allocation data for k-th volume [2]

Length of volume allocation extension: K*40+4 bytes

Notes

1) The number of elements is variable and depends on the number of volumes released at the same time.

2) Format and contents of a volume allocation element

Field number	Displacement hex	Displacement dec	Length (bytes)	Format	Meaning
1	+00	+0	8	A	Device type
2	+08	+8	4	B	Number of inputs/outputs
3	+0C	+12	4	B	Volume of data transferred
4	+10	+16	12	Z	Date and time of start of occupancy
5	+1C	+28	1	A	Allocation type: 'E' = exclusive 'S' = shareable
6	+1D	+29	1	–	– reserved –
7	+1E	+30	6	A	Volume serial number
8	+24	+36	2	Z	Century (start of allocation)
9	+26	+38	1	C	Season ID for allocation start [1]
10	+27	+39	1	C	Read/Write indicator [2]

Length of a volume allocation element: 40 bytes

Note

1) "S" for standard time (summer); "W" for daylight saving time (winter).

2) The read/write indicator value depends on the write ring occurence:
    "U" = Unknown or not relevant.
    "R" = A write ring was used.
    "W" = No write ring was used.

Extension 4: Account ID

Format and contents of this extension correspond to the relevant extension of the task accounting record.

General notes

1. The resources under review are devices and volumes.

    Devices include: unit-record devices, disk devices, tape devices and MTC devices. Volumes include: disk, tape, MTC and floppy disk.

    Public volume sets (PVS) are not under review, as they cannot be allocated to individual tasks.

2. Devices and volumes are allocated by

    –   a SECURE-RESOURCE-ALLOCATION command.
    –   an ADD-FILE-LINK command or a FILE macro.
    –   the OPEN processing.

    Devices and volumes are released by

    –   another SECURE-RESOURCE-ALLOCATION command.
    –   a REMOVE-FILE-LINK command or a RELTFT macro.
    –   CLOSE processing.
    –   the job termination.

3. The allocation type *exclusive or shareable* determines whether, and in which form, other tasks may reserve the resource in question.

Allocation type	Allocation type permitted for other tasks	Allocation type not permitted for other tasks
exclusive	– neither –	– either –
shareable	shareable	exclusive

Shareable allocation imposes fewer restrictions on contending tasks than exclusive allocation; it is therefore important to record the allocation type.
(This applies to disks and disk devices only; all other resources under review have no alternative to exclusive allocation.)

4. Interdependence of devices and volumes

   With tape devices there is no defined relationship between allocated devices and allocated volumes. (For example, a SECURE-RESOURCE-ALLOCATION command might allocate 5 tape units, but just 2 tapes.)

   – If a tape/disk device is not explicitly requested as a physical unit (see the UNIT parameter of the SECURE-RESOURCE-ALLOCATION command), a logical device (i.e. an arbitrary physical unit belonging to the specified device type) is allocated. The relationship between the logical device and the physical unit may be altered, for instance, as a result of MOVE operations. This is of no relevance to user accounting: what is posted here is the occupancy of logical devices. The relationship between volumes and physical units is recorded in operations accounting.

   – If a disk is allocated via a VOLUME specification or implicitly via a file, the allocation refers to the volume only (USE=DMS); the device management system does not establish a relationship between the requesting task and the allocated disk device.

   – On the one hand, tapes can be allocated without a device, for example with SECURE-RESOURCE-ALLOCATION TAPE=(V=vsn,T=T1600,MOUNT=N)); on the other hand, it is still possible to allocate devices without allocating a volume (e.g. with SECURE-RESOURCE-ALLOCATION DEVICE=(TAPE-C5,2)).

   Therefore, if every allocation (which always represents a restriction on other tasks) is to be evaluated, it is necessary to record allocations for both tape/disk devices and volumes.

5. Floppy disks are not subject to device management; they cannot be allocated with SECURE. Here, there is a unique correlation between the floppy disk and the associated drive during processing. A floppy disk drive may be allocated via a command without a floppy disk having been requested; however, the floppy disk itself can only be allocated implicitly via a drive. Allocations of drives are recorded as device allocations; allocations of floppy disks are not recorded.

6. Utilization data for devices and volumes is output in the form of the number of inputs/ outputs and the volume of data transferred. This data is attributed to both the volume used and the corresponding drive. Therefore care must be taken during evaluation, in order to avoid duplicate posting of these values: they must be assigned to either volume occupancy or drive occupancy.

    This duplicate recording of utilization data and the subdivision of device allocation data into unit-record data and tape/disk data offers the possibility, for disk and tape devices, of deactivating the relevant record extension so that either the device allocations or the volume allocations can be skipped. Tape/device usage is posted to either the device occupancy account or the volume occupancy account.

7. If several devices or volumes are released at the same time (e.g. EXIT-JOB, LOGOFF, SECURE-RESOURCE-ALLOCATION or WAIT-EVENT command), one entry (element) for each device/volume is generated in the unit-record/volume device allocation extension or in the volume allocation extension.
    The maximum number of entries depends on the maximum record length supported by the accounting system and on the number of devices/volumes released at a given time.

    If all device/volume allocation entries cannot be accommodated in the record, then the remaining elements are entered in a continuation record, which is just another device/ volume allocation record with the standard format of this record type.

8. Devices/volumes with an occupancy below 10 seconds are not recorded unless they can be listed in a TDEV accounting record together with resources used over a prolonged period of time. If this is not the case, no separate TDEV record is created for such devices/volumes. Negligible occupancy times caused by the commands/macros CATAL, DELETE-FILE, SHOW-FILE-ATTRIBUTES and FILE without the LINK operand or ADD-FILE-LINK with subsequent REMOVE-FILE-LINK or by successive SECURE-RESOURCE-ALLOCATION commands, are therefore not posted.

9. If systems support deactivates both extensions of the device and volume occupancy record, then the record type is implicitly deactivated, i.e. no record is created.

3.1.9 TATR – Task attribute update accounting record

The task attribute update accounting record is written whenever the task scheduling priority or the task scheduling attribute is modified.
The accounting record is created for user tasks and system tasks.

Maximum length of the task attribute update accounting record: 70 bytes

(A) Record definition: record ID "TATR"

(B) Identification section: user identification (see note)

(C) Basic information

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	6	Z	Date of modification [1]
2	06	6	6	Z	Time of modification [2]
3	0C	12	1	B	New task scheduling priority
4	0D	13	3	A	New task scheduling attribute ('TP' / 'DIA' / 'BAT')
5	10	16	2	Z	Century when changed [3]
6	12	18	1	C	Season ID of change [4]
7	13	19	1	–	– reserved –

Length of the basic information: 20 bytes

Notes

1) Date in the form `yymmdd`.

2) Time in the form `hhmmss`.

3) E.g. the string "19" to indicate the year 1999.

4) "S" for standard time (summer); "W" for daylight saving time (winter).

(D) Variable information

The variable information of the task attribute update record contains no record extensions.

Length of extension header: 2 bytes

Note

In the following cases the user ID and account number of the task in question cannot be supplied:
– Task is a system task.
– Task is in initialization phase.
– Task is executing the final termination step.
  In these cases the relevant fields contain blanks.
  The job number (TSN) is always output.

3.2 Accounting records for space accounting

Pubset identification

This identifies the pubset to which the memory space accounting relates.

Format and contents:

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	3	A	Pubset identifier "PUB"
2	03	3	4	A	Catalog ID [1]
3	07	7	1	–	– reserved –
4	08	8	8	A	Owner ID [2]

Length of pubset ID: 16 bytes

Notes

1) Family code (catalog identifier) of the pubset.

2) At present always "TSOS".

Private disk ID

The identification section of the space accounting records on private disks contains a description of the private disk whose space data is contained in the record.

Format and contents:

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	6	C	VSN of the disk
2	06	6	4	C	Mnemonic name of the disk [1]
3	0A	10	2	–	– reserved –

Length of the private disk ID: 12 bytes

Note

1) Mnemonic name of the disk according to the device table, see the "Commands" manuals [1]. Since this length may be either 2 or 4 characters, in the first case two characters X'40' are appended to the field.

3.2.1   DSPC – Space stocktaking accounting record

Space stocktaking is performed either at periodic intervals or is initiated via the ASPC macro by a user program under the systems support identification.

The length of the interval can be defined by means of the START-ACCOUNTING or MODIFY-ACCOUNTING-ATTRIBUTES command and always begins with the first full minute after activation of the accounting system.

Determination of the interval remains unaffected after the accounting file has been changed and is not synchronized with the file change. Thus, the next DSPC record is written to the new accounting file after the preset interval has elapsed. Space stocktaking covers all locally imported pubsets, including the home pubset from which the system was loaded.

The storage space occupied by users is divided into pubset-specific records.

Maximum length of space stocktaking accounting record: 492 bytes

(A) Record definition: record ID "DSPC"

(B) Identification section: pubset ID

(C) Basic information

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	12	Z	Date and time of start of stocktaking [1]
2	0C	12	1	A	Completeness indicator: 'C' = Continuation record to come [2] 'L' = Last record for pubset [3] 'I' = Information incomplete [4]
3	0D	13	2	Z	Century (current) [5]
4	0F	15	1	C	Season ID for current time [6]

Length of the basic information: 16 bytes

Notes

1) Date in the form yymmdd. Time in the form hhmmss.

2) At least one additional DSPC record will follow for this pubset.

3) Last DSPC record for this pubset; this concludes the current space stocktaking data for this pubset.

4) Space stocktaking for this pubset has been aborted; the pubset was rendered "inoperable" by an EXPORT-PUBSET command during stocktaking.

5) E.g. the string "19" to indicate the year 1999.

6) "S" for standard time (summer); "W" for daylight saving time (winter).

(D) Variable information

The variable information of the space stocktaking records contains one record extension.

Length of extension header: 4 bytes

Extension 1: Space occupancy data

This extension is a structure field extension comprising a variable number of elements. The number of elements depends on the number of user IDs entered in the user catalog of the pubset.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "SP"
2	02	2	1	B	Number of elements (K)
3	03	3	1	B	Element length (X'10')
4	04	4	16	*	1st element: space occupancy data for 1st user ID [1]
:	:	:	:	:	:
K+3	(K-1)*24+4		16	*	K-th element: space occupancy data for k-th user ID

Length of space occupancy extension: K$*$24+4 bytes

Notes

1) Format and contents of a space occupancy element

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	+00	+0	8	A	User ID
2	+08	+8	4	B	Number of occupied PAM blocks Level S0 [2]
3	+0C	+12	2	B	– reserved –
4	+0E	+14	2	B	– reserved –
5	+10	+16	4	B	Number of occupied PAM blocks Level S1 [2]
6	+14	+20	4	B	Number of occupied PAM blocks Level S2 [2]

Length of a space occupancy element: 24 bytes

2) Sum of PAM blocks occupied by user files on the pubset on the corresponding storage level.

3.2.2 DSPP – Private disk space stocktaking accounting record

Space stocktaking for private disks is either performed at periodic intervals or is initiated via the ASPC macro by a user program under the systems support identification.

The length of the interval can be defined by means of the START-ACCOUNTING or MODIFY-ACCOUNTING-ATTRIBUTES command and always begins with the first full minute after activation of the accounting system.

Determination of the interval remains unaffected after the accounting file has been changed and is not synchronized with the file change. Thus, the next DSPP record is written to the new accounting file after the preset interval has elapsed. Space stocktaking covers all locally imported private disks and is written to specific records for each and every user ID.

Maximum length of space stocktaking accounting record for private disks: 492 bytes

(A) Record definition: record ID "DSPP"

(B) Identification section: private disk identification

(C) Basic information

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	12	Z	Date and time of start of stocktaking [1]
2	0C	12	2	Z	Century (current) [2]
3	0E	14	1	C	Season ID for current time [3]
4	0F	15	1	–	– reserved –

Length of basic information: 16 bytes

Notes

1) Date in the form `yymmdd`; time in the form `hhmmss`.

2) E.g. the string "19" to indicate the year 1999.

3) "S" for standard time (summer); "W" for daylight saving time (winter).

(D) Variable information

The variable information of the space stocktaking record contains one record extension.

Length of extension header: 4 bytes

Extension 1: Space occupancy date

This extension is a structure field extension comprising a variable number of elements. The number of elements depends on the number of user IDs entered in the catalog (F1 label).

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "PS"
2	02	2	1	B	Number of elements (K)
3	03	3	1	B	Element length (X'10')
4	04	4	16	*	1st element: space occupancy data for 1st user ID [1]
:	:	:	:	:	:
K+3	(K-1)*24+4		16	*	K-th element: space occupancy data for k-th user ID

Length of space occupancy extension: $(K*16+4)$ bytes

Notes

1) Format and contents of a space occupancy element

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	+00	+0	8	A	User ID
2	+08	+8	4	B	Number of occupied pages [2]
3	+0C	+12	2	B	Number of cataloged files [3]
4	+0E	+14	2	B	– reserved –

Length of a space occupancy element: 16 bytes

2) Sum of PAM blocks occupied by user files on the private disk.

3) Number of files cataloged on the private disk.

3.2.3 DALC – Space allocation accounting record

One such record is available for each pubset, and an entry is created there on every allocation update.

Once a record has been filled, it is written to the accounting file (at the latest, however, when the pubset is exported by means of the EXPORT-PUBSET command for the home pubset or the SHUTDOWN command for the PAGING pubsets). If the accounting file is changed or the DALC record is deactivated, the information collected up to that point is either contained in the next accounting file or lost.

Maximum length of space allocation accounting record: 492 bytes

(A) Record definition: record ID "DALC"

(B) Identification section: pubset identification

(C) Basic information

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	6	Z	Date of record availability (= time of first entry) [1]
2	06	6	2	Z	Century (current) [2]
3	08	8	1	–	– reserved –

Length of basic information: 9 bytes

Notes

1) Date in the form `yymmdd`.

2) E.g. the string "19" to indicate the year 1999.

(D) Variable information

The variable information of the space allocation record contains one record extension.

Length of extension header: 4 bytes

Extension 1: Space modification data

This extension is a structure field extension comprising a variable number of elements.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "AL"
2	02	2	1	B	Number of elements (K)
3	03	3	1	B	Element length (X'20')
4	04	4	32	*	1st element: data on 1st allocation update [1]
:	:		:	:	:
K+3	(K-1)*32+4		32	*	K-th element: data on k-th allocation update

Length of space modification extension: (K*32+4) bytes

Notes

1) Format and contents of a space modification element

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	+00	+0	8	A	Affected user ID [2]
2	+08	+8	4	B	Number of occupied PAM blocks [3]

3	+0C	+12	4	B	Space modification value [4]
					    positive for allocations
					    negative for deallocations

4	+10	+16	4	Z/C	TSN of requesting task [5]
5	+14	+20	2	Z	Day of modification [6]
6	+16	+22	6	Z	Time of modification [7]

7	+1C	+28	2	C	Space type: [8]
					    PU for public disks
					    PR for private disks
					    TM for temporary space

8	+1E	+30	1	X	System ID [9]
9	+1F	+31	1	C	Season ID for modification [10]

Length of a space modification element: 32 bytes

2) User ID of file owner (need not be identical with the user ID of the person performing the modification).

3) Current space occupancy status for affected user ID.

4) Number of newly allocated or released PAM blocks. This value is already included in the number of occupied PAM blocks (see note 3).

5) User ID and account number of the requesting task can be seen from the relevant task/SPOOLOUT accounting record, which is uniquely identified by the TSN and the allocation update time (date, time).
If the allocation update was caused by a system task, the TSN consists of numeric characters (standard convention), i.e. in this case no assignable accounting record exists. In the case of allocation updates for the SYSEAM file, no requesting job number (TSN) is entered; "$EAM" is entered instead.

6) Day of month. Year and month can be taken from the basic information (or calculated, if two months are involved.

7) Time in the form `hhmmss`.

8) Recording of the space type in order to recognize temporary allocations.

9) System ID for unique identification of the system initiating the reservation or release of space on a shared pubset.

10) "S" for standard time (summer); "W" for daylight saving time (winter).

3.3 User-specific accounting records

3.3.1 UDAT – User data accounting record

The user data accounting record is generated either by means of the WRITE-ACCOUNTING-RECORD command or the AREC macro.

An appropriate authorization is required (see the MAX-ACCOUNT-RECORDS operand in the ADD-USER / MODIFY-USER-ATTRIBUTES command).

Maximum length of user data accounting record: 326 bytes

(A) Record definition: record ID "UDAT"

(B) Identification section: user identification

(C) Basic information

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	6	Z	Date of invocation [1]
2	06	6	6	Z	Time of invocation [2]
3	0C	12	2	Z	Century of invocation [3]
4	0E	14	1	C	Season ID of invocation [4]
5	0F	15	1	–	– reserved –

Length of basic information: 16 bytes

Notes

1) Date in the form `yymmdd`.

2) Time in the form `hhmmss`.

3) E.g. the string "19" to indicate the year 1999.

4) "S" for standard time (summer); "W" for daylight saving time (winter).

(D) Variable information

The variable information of the user data accounting record contains one record extension.

Length of extension header: 4 bytes

Extension 1: User data

This extension is a character string extension.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier " " [1]
2	02	2	1	B	X'00'
3	03	3	1	B	User data length [2]
4	04	4	L	C/X	User data [3]

Maximum length of user data extension: 258 bytes

Notes

1) The extension identifier consists of two blanks.

2) The maximum permissible user data length (L) is 254 bytes.

3) The user data is defined either in the WRITE-ACCOUNTING-RECORD command (with the USER-DATA operand) or the AREC macro (with the DATA operand).

3.3.2   UACC – User ledger-mark accounting record

The user ledger-mark accounting record is generated by means of the WRITE-ACCOUNTING-RECORD command.
This requires the same authorization as for writing user data records. The record contains roughly the same parameters as the task accounting record.

Maximum length of the user ledger-mark accounting record: 382 bytes

(A) Record definition: record ID "UACC"

(B) Identification section: user identification

(C) Basic information

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	6	Z	Date of job start [1]
2	06	6	6	Z	Time of job start [2]
3	0C	12	6	Z	Date of program entry [1]
4	12	18	6	Z	Time of program entry [2]
5	18	24	4+4	B2	Task CPU time (L)
6	20	32	4	B	Number of inputs/outputs (L)
7	24	36	4	B	Volume of data transferred (L)
8	28	40	8	B	Main memory occupancy integral (L)
9	30	48	8	B	Resident memory pool integral
10	38	56	4	B	Number of paging operations (L)
11	3C	60	1	B	Task scheduling priority (M)
12	3D	61	3	A	Task scheduling attribute (M) ('TP' / 'DIA' / 'BAT')
13	40	64	4	B	SECURE and MOUNT waiting time (L)
14	44	68	7	A	Task category
15	4B	75	1	–	– reserved –
16	4C	76	2	Z	Century of job start
17	4E	78	2	Z	Century (current)
18	50	80	8	B	Vector pages integral
19	58	88	8	B	Resident DATA SPACE integral
20	60	96	1	C	Season ID for job start [3]
21	61	97	1	C	Season ID current time [3]
22	62	98	1	–	– reserved –
23	64	100	4+4	B2	Standardized CPU time
24	6C	108	4+4	B2	/390 mode time

Length of basic information: 116 bytes

Key

> L = ledger mark
> M = maximum interval

Notes

1) Date in the form `yymmdd`.

2) Time in the form `hhmmss`.

3) "S" for standard time (summer); "W" for daylight saving time (winter).

   For the meaning of fields 4 through 19, see notes 3) through 10) under the basic information of the task accounting record.

(D) Variable information

The variable information of the user ledger-mark record contains six record extensions.

Length of extension header: 14 bytes

Extension 1: User identification

This extension is a character string extension.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "ID"
2	02	2	1	B	X'00'
3	03	3	1	B	Identification length [1]
4	04	4	L	C/X	User identification [2]

Maximum length of user identification extension: 12 bytes

Notes

1) The maximum length of the user identification is 8 bytes.

2) The user identification is defined in the:
   – WRITE-ACCOUNTING-RECORD command via the USER-ACCOUNTING-STEP operand.
   – AREC macro with the ID operand.

Extension 2: Background storage allocation

Format and contents of this extension correspond to the relevant extension of the task accounting record.
All utilization parameters recorded are ledger marks.

Extension 3: Inputs/outputs and volume of data per device group

Format and contents of this extension correspond to the relevant extension of the task accounting record.
All utilization parameters recorded are ledger marks.

Extension 4: Terminal inputs/outputs

Format and contents of this extension correspond to the relevant extension of the task accounting record.
All utilization parameters recorded are ledger marks.

Extension 5: Number of catalog accesses

Format and contents of this extension correspond to the relevant extension of the task accounting record.
All utilization parameters recorded are ledger marks.

Extension 6: Performance controller data

Format and contents of this extension correspond to the relevant extension of the task accounting record.
All utilization parameters recorded are ledger marks.

3.3.3 Freely defined user accounting records

Freely defined user accounting records are generated using the AREC macro (RECORD operand) and by means of system exit routines ($AREC macro).

The user obtains authorization by means of the MAX-ACCOUNT-RECORDS operand in the ADD-USER or MODIFY-USER-ATTRIBUTES command.

The record identifier is freely selectable, but should start with either X, Y or Z in order to avoid confusion with other accounting records.
The time stamp (field 2 of the record definition) is written automatically by the accounting system before the record is transferred to the recording task; field 2 of the record definition must therefore be kept free for this purpose (field 5 is reserved for future extensions).

Otherwise, the record can be structured as required by the generating user program or system exit routine.

However, for reasons of uniformity it is recommended that the format of the freely defined user accounting records be chosen in accordance with the basic structure of the BS2000 accounting record.

Maximum length of freely defined user records:

492 bytes without record length field

496 bytes with record length field

3.4 Accounting records for operations accounting

System identification

The identification section of the two system availability records consists of a system identi-
fication defining the installation and the operating system.

Format and contents:

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	8	A	Installation designation [1]
2	08	6	8	A	Operating system name [2]
3	10	16	4	A	Operating system version [3]
4	14	20	1	–	– reserved –
5	15	21	3	Z	Session number [4]
6	18	24	4	A	Catalog ID [5]
7	1C	28	1	–	'E' if there are more than 8 CPU IDs [6]
8	1D	29	21	C	Installation identifier [7]
9	32	50	6	C	Hardware/software interface [8]
10	38	56	64	X	CPU IDs [9]
11	78	120	64	–	CPU IDs [10]
12	B8	184	10	C	Extended version identifier [11]

Length of system identification: 194 bytes

Notes

1) Configuration name, e.g. "S190".

2) Name of Control Program defined with IOGEN in the NAME parameter of the GEN
   statement, e.g. "BS2V170".

3) E.g. "V170".

4) From "001" to "255".

5) Catalog ID of the home pubset.

6) 'E' indicates that the maximum possible number of CPUs is greater than 8.

7) Complete installation identifier (e.g. "7.500-S190-30").

8) "CFCS12" for CFCS1 or CFCS2;
   "CFCS3" for CFCS3.

9) Bytes 0-7:   CPU ID of the first CPU
    Bytes 8-15:   CPU ID of the second CPU
    Bytes 16-23: CPU ID of the third CPU
    Bytes 24-31: CPU ID of the fourth CPU
    Bytes 32-..:   ...

    Where there are fewer than eight CPUs the fields for the others are filled with zeros (8X'00'). Interpretation of the CPU IDs varies depending on the HSI.

10) If more than 8 CPUs are being used, the CPU IDs of CPUs 9 through 16 are stored. If fewer than 16 CPUs are being used, the remaining fields contain zeros (8X'00').

11) Extended version identifier for BS2000/OSD-BC (e.g. "V17.0A00pp").

System identification schema

X'00'	
X'04'	Installation designation
X'08'	
X'0C'	Operating system name
X'10'	Operating system version
X'14'	Reserved / Session number
X'18'	Catalog ID
X'1C'	Reserved / Complete Installation identifier
X'30'	
X'34'	HSI
X'38'	CPU-Id 1
X'40'	CPU-Id 2
X'48'	CPU-Id 3
X'50'	CPU-Id 4
X'58'	CPU-Id 5
X'60'	CPU-Id 6
X'68'	CPU-Id 7
X'70'	CPU-Id 8
X'78'	CPU-Id 9
X'80'	CPU-Id 10
X'88'	CPU-Id 11
X'90'	CPU-Id 12
X'98'	CPU-Id 13
X'A0'	CPU-Id 14
X'A8'	CPU-Id 15
X'B0'	CPU-Id 16
X'B8'	Extended version identifier
X'C2'	

Service unit identification

The two records for the service unit account contain as identification section a service unit identifier which identifies the receiving subsystem and the resource controlled by the service unit task.

Format and contents

Field number	Displacement		Length (bytes	Format	Meaning
	hex	dec			
1	00	0	8	A	Service unit name [1]
2	08	8	8	A	Resource name [2]
3	10	16	4	A/C	TSN of the service unit task

Length of service unit identification: 20 bytes

The length of the service unit identification is fix for all records, which contain this section. But it may be possible, that the length changes in future BS2000 versions. Therefore it is recommended, to take the real length of this section from the record definition (field 3).

Notes

1) Type of the service unit, e.g. "SPOOLIN". You can take the possible values from the description of the collected servic units.

2) Identifies the service unit task concerned more precisely and distinguishes it from other tasks of the same service unit type.

Overview about the format of the service unit identification

X'14'	
X'18'	Service unit name
X'1C'	
X'20'	Resource name
X'24'	
	TSN
X'28'	

3.4.1   AOPN – Accounting open record

This record is written when a new accounting file is opened:

– during system initialization
– following a START-ACCOUNTING command
– following a CHANGE-ACCOUNTING-FILE command
– on automatic file change after a DMS error
– on a restart of the accounting write task, if this opens a new accounting file

The accounting open record is not necessarily the first accounting record in the accounting file. For instance, if the accounting file was already present and is now being extended, the AOPN record is of course preceded by accounting records. Consequently, systems support must determine whether or not the last accounting record written is a close record. If this is not the case, the preceding accounting period was in all probability terminated abnormally (system crash, DMS error).

If the new accounting file has been opened as a result of a DMS error during processing of the preceding file, the last records of the preceding file are located at the beginning of the file, followed by an accounting open record and a message indicating the relevant DMS error.

If the new accounting file has been opened during system initialization or by a START-ACCOUNTING or CHANGE-ACCOUNTING-FILE command, then the AOPN record is the first record to be written to the accounting file.

The analysis program has to check whether the accounting records preceding an AOPN record with the message "file change due to DMS error" are already contained in the preceding file, so that duplicate accounting is avoided.
Such duplicates can be recognized by their identical time stamps (field 2 of the record definition).

Maximum length of accounting open record: 698 bytes

(A) Record definition: record ID "AOPN"

(B) Identification section: system identification

(C) Basic information

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	6	Z	Date of system initialization [1]
2	06	6	6	Z	Time of system initialization [2]
3	0C	12	6	Z	Date of file opening [3]
4	12	18	6	Z	Time of file opening
5	18	24	4	A	Cause of file opening [4]
6	1C	28	2	Z	Century of system initialization [5]
7	1E	30	2	Z	Century of file opening [5]
8	20	32	1	C	Season ID of system initialization [6]
9	21	33	1	C	Season ID of file opening [6]
10	22	34	5	C	Time zone [7]
11	27	39	4	C	Time difference [8]
12	2B	43	1	–	– reserved –

Length of basic information: 44 bytes

Notes

1) IPL (initial program loading) date in the form `yymmdd`.

2) Time in the form `hhmmss`.

3) Time stamp after OPEN for the new accounting file.

4) Opening of the file was triggered by:

   'IPL ' = Startup/system initialization
   'STRT' = START-ACCONTING command
   'CHNG' = CHANGE-ACCOUNTING-FILE command
   'DMSE' = DMS error during writing to the previous file
   'RST ' = Restart of the accounting write task.

5) E.g. the string "19" to indicate the year 1999.

6) "S" for standard time (summer); "W" for daylight saving time (winter).

7) Difference between local time and universal world time (UTC) in the form *shhmm* (where s = + or −).

8) Difference in hours and minutes between summer time and winter time.

(D) Variable information

The variable information of the accounting open record contains two record extensions.

Length of extension header: 6 bytes

Extension 1: Name of preceding file

This extension is a character string extension. It is generated only after a file change caused by the CHANGE-ACCOUNTING-FILE command, or following a DMS error.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "FN"
2	02	2	1	B	X'00'
3	03	3	1	B	File name length (L)
4	04	4	L	F	Name of preceding file [1]

Maximum length of file name extension: (54+4 = 58) bytes

Note

1) The file name is written to field 4 in the form ":catid:$userid.filename".
   For example, if the command CHANGE-ACCOUNTING-FILE NAME=ABR1 is issued, the accounting file is cataloged under the name ":catid:$TSOS.ABR1".

Extension 2: Main memory configuration and working storage size

This extension is a structure field extension comprising one element. It is generated only during system initialization and on startup of the accounting system with the START-ACCOUNTING command.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "MM"
2	02	2	1	B	Number of elements (X'01')
3	03	3	1	B	Element length (X'0C')
4	04	4	4	B	Main memory size [1]
5	08	8	4	B	Size of pageable memory [2]
6	0C	12	2	B	Beginning of system address space [3]
7	0E	14	2	B	Size of system address space [3]

Length of main memory / working storage extension: 16 bytes

Notes

1) Size of main memory actually serviced by the system, in units of 4-Kbyte memory pages.

2) Size of that part of main memory which is available for paging after system loading or on startup of the accounting routine, in units of 4-Kbyte memory pages.

3) Specification in megabytes.

Extension 3: CPU IDs for more than 16 CPUs

This extension is a structure field extension with a variable number of elements. It is created only if more than 16 CPUs are active, i.e. the number of CPU IDs is greater than 16.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "CI"
2	02	2	1	B	Number (K) of elements [1]
3	03	3	1	B	Length 8 (X'08')
4	04	4	8	*	1st element: CPUID17 [2]
:	:	:	:	:	:
K+3	(K-1)*8+4		8	*	k-th element: CPUIDk

Length of the main memory extension: (K*8+4) bytes

Note

1) The number K is variable and is dependent on the number of CPU IDs.
   K = number of CPUs used - 16 (max. 64 - 16 = 48),
   since the first 16 CPUs are written to the system ID.

2) The elements contain the 17th - k-th CPU IDs.

3.4.2 ACLS – Accounting close record

This record is written when an accounting file is closed:

– during shutdown processing.
– following a STOP-ACCOUNTING command.
– following a CHANGE-ACCOUNTING-FILE command.
– during abnormal termination of the accounting write task, if this closes the accounting file.

The absence of an accounting close record indicates that the accounting file was not properly closed, either because of a DMS error or due to a system crash. Even in this case, an accounting open record and additional records may follow if the accounting file in question was extended later on by means of OPEN EXTEND.

Maximum length of accounting close record: 610 bytes

(A) Record definition: record ID "ACLS"

(B) Identification section: system identification

(**C) Basic information**

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	6	Z	Date of file closure [1]
2	06	6	6	Z	Time of file closure [2]
3	0C	12	4	A	Cause of file closure [3]
4	10	16	2	Z	Century of file closure [4]
5	12	18	1	C	Season ID of file closure [5]
6	13	19	1	–	– reserved –

Length of basic information: 20 bytes

Notes

1) Date in the form `yymmdd`.

2) Time in the form `hhmmss`.

3) File closure was triggered by:

    'SHUT' = SHUTDOWN command
    'STOP'   = STOP-ACCOUNTING command
    'CHNG' = CHANGE-ACCOUNTING-FILE command
    'ATT '   = Abnormal termination of the accounting write task

4) E.g. the string "19" to indicate the year 1999.

5) "S" for standard time (summer); "W" for daylight saving time (winter).

(D) Variable information

The variable information of the accounting close record contains one record extension.

Length of extension header: 4 bytes

Extension 1: Name of successor file

This extension is a character string extension. It is generated only on a file change caused by the CHANGE-ACCOUNTING-FILE command.

Field number	Displacement hex	dec	Length (bytes)	Format	Meaning
1	00	0	2	A	Extension identifier "FN"
2	02	2	1	B	X' 00'
3	03	3	1	B	File name length (L)
4	04	4	L	F	Name of successor file [1]

Length of file name extension: 58 bytes

Note

1) The file name is written to field 4 in the form ":catid:$userid.filename".
   For example, if the command CHANGE-ACCOUNTING-FILE NAME=ABR1 is issued, the accounting file is cataloged under the name ":catid:$TSOS.ABR1".

Extension 2: CPU IDs for more than 16 CPUs

This extension is a structure field extension with a variable number of elements. It is created only if more than 16 CPUs are active, i.e. the number of CPU IDs is greater than 16.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "CI"
2	02	2	1	B	Number (K) of elements [1]
3	03	3	1	B	Length 8 (X'08')
4	04	4	8	*	1st element: CPUID17 [2]
:	:		:	:	:
K+3	(K-1)*8+4		8	*	k-th element: CPUIDk

Length of the main memory extension: (K*8+4) bytes

Note

1) The number K is variable and is dependent on the number of CPU IDs.
   K = number of CPUs used - 16 (max. 64 - 16 = 48),
   since the first 16 CPUs are written to the system ID.

2) The elements contain the 17th - k-th CPU IDs.

3.4.3 RCPU – CPU availability accounting record

This record is written at regular intervals. The length of the periodic interval can be set by means of the START-ACCOUNTING and MODIFY-ACCOUNTING-ATTRIBUTES commands.
The CPU time percentage values supplied are the results measured during the actual recording intervals.

The first interval starts at completion of the first minute after startup of the accounting system or after activation of the RCPU record (using the START-ACCOUNTING or MODIFY-ACCOUNTING-PARAMETERS commands).

On a change of the accounting file (via the CHANGE-ACCOUNTING-FILE command or due to a DMS error), interval timing continues as before, i.e. it is not synchronized with the file change. The next RCPU record is written to the new accounting file at the end of the current interval.

When the RCPU record is deactivated (via MODIFY-ACCOUNTING-PARAMETERS) or when the accounting system is terminated (STOP-ACCOUNTING or SHUTDOWN), there is no synchronization either. The values measured during the current interval are no longer recorded.

Maximum length of CPU availability accounting record: 70 bytes

(A) Record definition: record ID "RCPU"

(B) Identification section

This section is omitted; the length field (field 3 of the record definition) contains zero.

(C) Basic information

Field number	Displacement		Length	Format	Meaning
	hex	dec	(bytes)		
1	00	0	6	Z	Date of recording [1]
2	06	6	6	Z	Time of recording [2]
3	0C	12	4+4	–	– reserved –
4	14	20	4+4	B2	Task CPU time (TU and TPR) [3]
5	1C	28	4+4	B2	Interrupt analysis CPU time [4]
6	24	36	4+4	B2	CPU idle time [5]
7	2C	44	2	Z	Century (current) [6]
8	2E	46	1	C	System ID (current) [7]
9	2F	47	1	–	– reserved –

Length of basic information: 48 bytes

Notes

1) Date in the form `yymmdd`.

2) Time in the form `hhmmss`.

3) Sum of the CPU times on all servers which were used in the nonprivileged program state (TU) and in the task privileged program state (TPR).

4) Sum of the CPU times on all servers which were used in the interrupt analysis state (SIH).

5) Sum of the CPU idle times for all servers.

6) E.g. the string "19" to indicate the year 1999.

7) "S" for standard time (summer); "W" for daylight saving time (winter).

(D) Variable information

The variable information of the CPU availability record contains no record extensions.

Length of extension header: 2 bytes

3.4.4 RSRV – Service accounting record

Services performed for user tasks by certain system/subsystem tasks are recorded with the aid of the RSRV accounting record. For exampla, services such as SPOOLOUT operations or lines printed can be collected by a corresponding driver task and written to the accounting file via the RSRV record.

At present the spoolout driver task record is provided. The records for spoolout driver tasks are created when the spoolout driver task is terminated (SPOOLOUT PROCESSING COMPLETED ...).

Maximum length of spoolout driver task accounting record: 106 bytes

(A) Record definition: record ID: "RSRV"

(B) Identification section: service unit identification

The service unit identification is identical in the two records for the accounting of the spoolout driver tasks.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	8	A	"SPOOLOUT" [1]
2	08	8	2	A	Type of spoolout device [2]
3	0A	10	2	A	Mnemonic name of spoolout device
4	0C	12	4	–	– reserved –
5	10	16	4	A/C	TSN of spoolout driver task

Length of service unit identification: 20 bytes

Notes

1) Designation of the service unit type.

2) The description of the resource is divided into several fields to make easy the assignment of the separate spoolout accounting records:

   (1) Type of the spoolout device

   'LP'   = Line printer
   'ND'   = Laser printer
   'UT'   = User Spool tape
   'RT'   = Replay Spool tape

   (2) Mnemonic name of the spoolout device as well as a reserved field for future extensions.

   The display of the type of spoolout device here corresponds to the case identifiers for local spoolout operations in the output medium extension of the spoolout record.

The service unit task accounting record contains no service unit-specific data with exception of the service unit identification. Therefore the following descriptions are only valid for the service accounting record.

(C) Basic information

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	6	Z	Date of service task start [1] [3]
2	06	6	6	Z	Time of service task start [2] [3]
3	0C	12	6	Z	Date of service task end [1]
4	12	18	6	Z	Time of service task end [2]

Length of basic information: 24 bytes

Notes

1) Date in the form `yymmdd`.

2) Time in the form `hhmmss`.

3) Moment (date, time) of the service unit start = Moment of the service unit task creation.

(D) Variable information

The variable information of the service unit accounting record contains two service unit-specific record extensions; there stucture and content is described below.

Extension 1: Resource description

This extension is a case distinction extension. The extension identifier is "RD" in either case. The case identifier for spoolout service unit tasks is "SOUT".

a) Spoolout device description
   Description of the local spoolout device.

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	2	A	Extension identifier "RD"
2	02	2	1	B	Number of elements (X'01')
3	03	3	1	B	Element length (X'0C')
4	04	4	4	A	Case identifier "SOUT"
5	10	16	8	A	Device type of spoolout device [1]

Length of spoolout device extension: 16 bytes

Note

1) The permissible device types are defined by the BS2000 device management (see the device type code tables in the "System installation" manual [7]).

Extension 2: Performance data

This extension is a case distinction extension. The extension identifier is "SV" in either case. The case identifier for spoolout service unit tasks is "SOUT".

a) Spoolout performance data
   Description of the performance, which was performed by the spoolout driver task.

Field number	Displacement hex	Displacement dec	Length (bytes)	Format	Meaning
1	00	0	2	A	Extension identifier "SV"
2	02	2	1	B	Number of elements (X'01')
3	03	3	1	B	Element length (X'0C')
4	04	4	4	A	Case identifier "SOUT"
5	08	8	4	B	Number of spoolout processes [1]
6	0C	12	4	B	Number of printed lines [2]
7	10	16	4	B	Number of printed bytes [2]

Length of spoolout performance extension: 20 bytes

Notes

1) Corresponds to the number of accounting records (if switched on) for the according spoolout device.

2) Total number of lines and bytes printed; contains the lines printed and records written for all files that are spooled out.

3.5 Accounting records of DSSM (Dynamic SubSystem Management)

Subsystem ID

The subsystem ID describes the subsystem to which the subsystem accounting data refers.

Format and contents:

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	**dec**			
1	00	0	8	A	Name of the subsystem
2	08	8	7	A	Subsystem version
3	0F	15	8	Z	Date of call [1]
4	17	23	6	Z	Time of call [2]

Length of DSSM identifier: 29 bytes

Notes

1) Date in the form `yyyymmdd`.

2) Time in the form `hhmmss`.

3.5.1 ESMC – Subsystem initialization accounting record

The accounting record is written each time the initialization phase of a subsystem is executed.

The subsystem executes these termination routines under the control of DSSM in connection with the START-SUBSYSTEM and RESUME-SUBSYSTEM commands.

Maximum length of the subsystem initialization accounting record: 54 bytes

(A) Record definition: record ID "ESMC"

(B) Identification section: subsystem ID

(C) Basic information

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	1	B	Status flag [1]
2	01	1	1	A	Season ID (current) [2]
3	02	2	1	–	– reserved –

Length of basic information: 3 bytes

Notes

1) The status flag can take on two possible values:

  1 The subsystem is restarted after a wait state (RESUME-SUBSYSTEM command).

  0 The subsystem is started (START-SUBSYSTEM command).

2) "S" for standard time (summer); "W" for daylight saving time (winter).

(D) Variable information

The variable information of the subsystem initialization accounting record contains **no** record extensions.

3.5.2 ESMD – Subsystem termination accounting record

The accounting record is written each time the initialization phase of a subsystem is executed.

The subsystem executes this termination routine under control of DSSM in connection with the STOP-SUBSYSTEM and HOLD-SUBSYSTEM commands.

Maximum length of subsystem termination accounting record: 54 bytes

(A) Record definition: record ID "ESMD"

(B) Identification section: subsystem ID

(C) Basic information

Field number	Displacement		Length (bytes)	Format	Meaning
	hex	dec			
1	00	0	1	B	Status flag [1]
2	01	1	1	A	Season ID (current) [2]
3	02	2	1	–	– reserved –

Length of basic information: 3 bytes

Notes

1) The status flag can take on two possible values:

    1   The subsystem is placed in the wait state (HOLD-SUBSYSTEM command).

    0   The subsystem is terminated (STOP-SUBSYSTEM command).

2) "S" for standard time (summer); "W" for daylight saving time (winter).

(D) Variable information

The variable information of the subsystem termination accounting record contains **no** record extensions.

Related publications

The manuals are available as online manuals, see *http://manuals.ts.fujitsu.com*, or in printed form which must be paid and ordered separately at *http://manualshop.ts.fujitsu.com*.

[1] **BS2000/OSD-BC**
Commands
User Guide

[2] **BS2000/OSD-BC**
Introductory Guide to Systems Support
User Guide

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

[4] **BS2000/OSD-BC**
Executive Macros
User Guide

[5] **PCS** (BS2000/OSD)
Performance Control Subsystem
User Guide

[6] **RAV (**BS2000/OSD)
Computing Center Accounting Procedure
User Guide

[7] **BS2000/OSD-BC**
System installation
User Guide

Related publications

Index