UFAS Batch Booster

User's Guide

File and Volume Management

DPS7000/XTA

NOVASCALE 7000

UFAS Batch Booster

User's Guide

File and Volume Management

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SCOPE AND OBJECTIVES

The objective of this manual is to explain how to use the UFAS Booster option on Bull DPS 7000 systems.

INTENDED READERS

This manual is intended for system administrators and programmers who want to use this option.

Some of the information may also be of interest to managers.

STRUCTURE OF THIS DOCUMENT

Section 1	gives an overview of the UFAS Booster option and explains the levels of support in relation to the GCOS 7 Technical Version.
Section 2	describes UFAS Booster BPB and its operational environment.
Section 3	describes the Fast Access modules.
Section 4	tells you about Optimized Mode.
Appendix A	discusses the relevance of UFAS Booster BPB to GCL.

RELATED DOCUMENTS

File Management Documentation:

UFAS-EXTENDED User's Guide..............................*47 A2 04UF*

Catalog Management User's Guide...........................*47 A2 35UF*

GCOS 7-V6 Data Management Utilities
User's Guide *47 A2 26UF*

JCL Documentation:

JCL Reference Manual *47 A2 11UJ*

JCL User's Guide..*47 A2 12UJ*

IOF and GCL Documentation:

IOF Terminal User's Reference Manual:
Part 1 ....*47 A2 38UJ*
Part 2 ....*47 A2 39UJ*
Part 3 ....*47 A2 40UJ*

GCOS 7 System Operation Documentation:

GCOS 7-V5/V6 System Operator's Guide................ *47 A2 60UU*
GCOS 7-V7 System Operator's Guide *47 A2 47US*

GCOS 7-V5/V6/V7 Console Messages *47 A2 61UU*

GCOS 7-V3/V5/V6 Messages and Return Codes *47 A2 10UJ*

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1. What is UFAS Booster?

UFAS Booster is a billed option (MI) available for GCOS 7 HPS and AP Technical Version V6 and subsequent versions.

UFAS Booster provides two levels of service:

- BPB (Blocks per Buffer), available from GCOS 7 Version V6, which provides greatly improved I/O (input/output) performance by enabling multiple block I/O operations during disk access, instead of block by block operations. This optimizes elapse and CPU time during file accesses.

- the Fast Access modules and Optimized Mode described in chapters 3 and 4, available from GCOS 7 Version V7.

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2. UFAS Booster BPB

2.1 OVERVIEW

UFAS Booster BPB is supported from GCOS 7 Technical Version V6.

With UFAS Booster BPB, UFAS-EXTENDED transfers several CIs from or to the buffers in a single Input/Output. The number of CIs depends on the value you set with the BPB parameter. This value must be in the range 2 to 255.

The value of BPB is automatically decreased by the access method to comply with the rule:

```
BPB * CISIZE < 64K bytes.
```

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2.2 ACTIVATION

The statements or keywords used to activate UFAS Booster BPB are as described below.

2.2.1 Activation External to the Program

UFAS Booster BPB can be activated in the step enclosure or by a utility as shown in the following table:

Statement	Keyword	Parameter
JCL Step Enclosure	DEFINE	BPB
JCL Utilities	INDEF OUTDEF PRTDEF INDEF2 COMDEF	BPB

2.2.2 Activation Within a Program

UFAS Booster BPB cannot be initiated by a statement or option in the source code of a COBOL or C Language program.

In GPL, use H_FD or H_DEFINE/H_DCFILE with the BPB parameter.

2.3   ENVIRONMENT

UFAS Booster BPB is effective in the following environment:

- **file access** must be at record level,

- the **value** of the BPB parameter must be greater than 1,

- the **application** must be BATCH monoprocess,

- the **file organization** must be SEQUENTIAL or RELATIVE,

- **file assignment** must be:

  - ONEWRITE/SPREAD
  - ONEWRITE/SPWRITE
  - NORMAL/SPREAD
  - NORMAL/SPWRITE
  - NORMAL/READ
  - NORMAL/WRITE
  - or MONITOR/READ with READLOCK=STAT

- **open mode** must be INPUT, OUTPUT, or APPEND,

- **access mode** must be SEQUENTIAL,

- **version** must be CURRENT,

- there must be **no journalization,**

- there must be **no multi SCB mechanism,**

- there must be **no GAC (General Access Control)**.

When these conditions are not met, UFAS Booster BPB is ineffective. The value of BPB is ignored and the processing is executed as if the value were set to 1. The process is not usually aborted, and there is no error message or return code. This is not the case, however, with the use of the multi SCB mechanism (for instance, access to UFAS files under IQS). If this mechanism is used with a BPB parameter greater than 1, you will receive the return code CONFLICT.

2.4 SUPPORT OF DATA MANAGEMENT UTILITIES

2.4.1 List of Utilities

UFAS Booster BPB is effective with the following data management utilities:

COMPARE	on both the input files, and the output file, provided that the files are not relative files in direct access.
CREATE	on the input or the output file, provided that the file is not a relative file in direct access.
PRINT	on the input file, except when KEYLOC specifies a secondary key.
VOLSAVE/ FILSAVE	on the output file provided that it is a UFAS disk file.
VOLREST/ FILREST	on the input file provided that it is UFAS disk file;
All Utilities	the PRTFILE (if UFAS) output file.
All Utilities	the COMFILE (if UFAS) input file.

2.4.2   Examples of Utilities

```
CREATE    INFILE=(input-file)
          OUTFILE=(output-file)
          INDEF=(BPB=10);

PRINT     INFILE=(input-file)
          INDEF=(BPB=20);

COMPARE   INFILE=(input-file1)
          INFILE=(input-file2)
          OUTFILE=(output-file)
          OUTDEF=(BPB=10)
          INDEF1=(BPB=5)
          INDEF2=(BPB=5);

PRINT     INFILE=(input-file)
          COMFILE=(command-file)
          COMDEF=(BPB=10);
```

2.5   FILE TRANSFER

UFAS Booster BPB is effective with the file transfer utility:

- on the local file, where BPB=1 by default. To modify the value, use the INDEF or OUTDEF parameters as indicated in the examples below:

- on the remote file, where BPB=255. This is both the default value and a fixed value - it cannot be modified.

Example (Sending Site):

```
FILTFR INFILE = (local-file)
       OUTFILE = (remote-file, SITE = site)
       INDEF = (BPB = 25);
```

Example (Receiving Site):

```
FILTFR INFILE = (remote-file, SITE = site)
       OUTFILE = (local-file)
       OUTDEF = (BPB = 255);
```

2.6 SORT/MERGE UTILITIES

2.6.1 Cases Where UFAS Booster BPB is Effective

UFAS Booster BPB is effective when the SORT/MERGE utilities select record level access to the input or the output file.

This is the case for:

- RELATIVE files,

- SEQUENTIAL files in INPUT, in any of the following conditions:

  - SHARE is not NORMAL, or
  - NBBUF=1, or
  - not all the volumes are mounted for the file, or
  - TRUNCSSF is present, or
  - DSL contains KEYADDR or ADD-DATA or ADDROUT,

- SEQUENTIAL files in OUTPUT, in any of the following conditions:

  - SHARE is not NORMAL, or
  - NBBUF=1, or
  - not all the volumes are mounted for the file.

- UFAS disk COMFILE / PRTFILE.

2.6.2   Examples of SORT/MERGE

```
SORT    INFILE  = (X.I  BPB=2)
        OUTFILE = (X.O BPB=3)
        COMFILE = (X.C  MB=S);

GSORT   INFILE = X.I   INDEF =  (BPB=3)
        OUTFILE = X.O  OUTDEF = (BPB=3)
        COMFILE=(X.C  MB=S);

MERGE   INFILE1 = (X.I1 BPB=2)
        INFILE2 = (X.I2 BPB=3)
        OUTFILE = (X.O BPB=4)
        COMFILE = (X.C  MB=S);

GMERGE  INFILE1=X.I1 INFILE2=X.I2  OUTFILE=X.O
        INDEF1  = (BPB=2)
        INDEF2  = (BPB=3)
        OUTDEF  = (BPB=4)
        COMFILE = (X.C  MB=S);
```

3. UFAS Booster Fast Access

In Technical Version V7, the scope of UFAS Booster is extended to include Fast Access functions. The Fast Access read and write modules manage:

- **file organizations**: SEQUENTIAL, RELATIVE, and INDEXED,

- all **FILE SHARING** specifications,

- **READ** verbs in INPUT processing mode

- **WRITE** verbs in OUTPUT or APPEND processing mode,

- all cases of *de facto* **sequential accesses** either in SEQUENTIAL ACCESS or DYNAMIC ACCESS mode.

These access method improvements do not apply to certain contexts of GCOS 7 utilities, either because they do not use the UFAS Fast Access interface, or because they do not support optimized mode (described in chapter 4).

Fast Access is effective only in BATCH mono-process COBOL programs. If your programs contain SORT subroutines, UFAS fast access mode is not activated if the program is linked in multi-process mode (multi-process parallel SORT facility).

There is no extra speed advantage with Fast Access when UFAS control intervals contain only one record (which is the default case for FILSAVE DISK OUTFILE / FILREST DISK INFILE). With this exception, Fast Access accelerates the utilities listed in sub-section 2.4, the local files concerned in sub-section 2.5, and the SORT/MERGE utilities decribed in sub-section 2.6, whenever BPB is taken into account for UFAS disk files.

3.1   ACTIVATION METHODS

UFAS Booster Fast Access is based on a set of specialized modules of the UFAS access method. These modules are activated in two different ways :

- static selection at OPEN time,
- dynamic decision at run-time.

3.1.1   Static Activation

At file OPEN time, the user-defined static parameters (user program, JCL, file characteristics) drive the selection and setting of the appropriate fast access modules. The parameters used for this selection are :

- file organization, record format and size,
- access mode,
- processing options (processsing mode, RERUN CLAUSE specification).

3.1.2   Dynamic Activation

At run time, the selected fast access module detects any conditions where it cannot operate and makes a CALL to the standard UFAS procedure to support the full functionalities of the product.

3.2   AVAILABILITY OF FAST ACCESS MODULES

The table below shows the availability of the UFAS Booster Fast Access modules in relation to the file characteristics.

Table 3-1. Availability of Fast Access Modules

			Fast Access availability with	
			TS7152	TS7254
ORGANIZATION	SEQUENTIAL	INPUT,OUTPUT, APPEND (EXTEND)	Y	Y
		UPDATE (IO)	N	N
	RELATIVE	INPUT,OUTPUT, APPEND (EXTEND)	N	Y
		UPDATE (IO)	N	N
	INDEXED	INPUT	Y	Y
		OUTPUT	N	Y
		APPEND (EXTEND) UPDATE (IO)	N	N
SHARING	NORMAL		Y	Y
	others		N	Y
ACCESS MODE	SEQUENTIAL		Y	Y
	DYNAMIC		N	Y (see note)
	DIRECT		**N/A**	**N/A**
RECORD	Fixed		Y	Y
FORMAT	Variable		Y	Y

Note: In DYNAMIC mode (START verbs followed by several READ NEXT verbs), performance improvement depends on the number of effective sequential accesses. A large number of START verbs will "break" the Fast Access sequences.

3.3   FUNCTIONS SUPPORTED

standard UFAS functions are also supported by the Fast Access modules:

- RERUN CLAUSE: RERUN EVERY "nnn" RECORDS (record counting is executed and is used for automatic CHECKPOINT activation),

- record length handling :

  - WRITE in VARIABLE FORMAT: take the effective length of data and transfer the real length in the record,

  - WRITE in FIXED FORMAT: take the user-specified data length and pad the record up to the record size if needed,

  - READ in FIXED or VARIABLE FORMAT: return the effective data length,

  - READ in FIXED or VARIABLE FORMAT: check record working area size and truncate the record if it is greater than WA (and set "return code").

  - ZERO length record support (READ or WRITE with VARIABLE FORMAT),

- record counting for output of statistics in the JOR at CLOSE time.

4. Optimized Mode

4.1 DEFINITION

Optimized mode is a special fast access mode available from GCOS 7 Version V7, where maximum performance is achieved by reducing the functionalities supported by the read or write UFAS modules to the minimum subset.

In optimized mode, the access method does not support many options of the standard UFAS product nor does it check the occurrence of these options at the user's program interface. The corresponding options are ignored.

4.1.1 Activation

explicitly specified by the user, by means of an OPTIMIZE keyword which can be:

* in the JCL statement DEFINE:

  ```
  $DEFINE ifn, ...., OPTIMIZE
  ```

  This is not applicable to the INDEF or OUTDEF statement of the JCL for GCOS 7 utilities, nor is it is applicable to GCL.

* in the COBOL source program:

  "APPLY OPTIMIZE" in the FILE SECTION.

4.1.2 Functionalities Supported

Optimized mode is applicable only to read or write operations on UFAS sequential files with fixed or variable length records of not more than 256 bytes.

Notes: If you specify optimized mode for relative or indexed files, the OPTIMIZE option is ignored.

This mode is not applicable to UFAS files that are accessed via GCOS 7 utilities.

Optimized mode supports record length handling for:

- WRITE in VARIABLE FORMAT: takes the effective length of data and transfers the real length in the record,

- READ in VARIABLE FORMAT: returns the effective data length,

- READ or WRITE in VARIABLE FORMAT: "ZERO length" record support.

- READ and WRITE in FIXED FORMAT: subject to the restrictions detailed in the next paragraph.

4.1.3 Functionalities Not Supported

The following functionalities of UFAS Booster are not supported by optimized mode.

- RERUN CLAUSE: RERUN EVERY "nnn" RECORDS (record counting is not executed or used for automatic checkpoint activation),

- record length handling for:

  - WRITE in FIXED FORMAT: no padding of the record in case of difference between the user-specified data length and the file record size,

  - READ in FIXED FORMAT : no return of the effective data length (which is always the same one and is equal to the file record size),

  - READ in FIXED or VARIABLE FORMAT: no record working area size checking for truncation of the record if it is greater than the user program work area (and no "return code" setting).

  - record counting for output of statistics in the JOR at CLOSE time (the statistics are not printed for this file).

A. Usage in GCL

This manual discusses UFAS Booster BPB in the context of batch mode, and consequently via JCL. However, UFAS Booster BPB also provides benefits in GCL.

In GCL, UFAS Booster BPB is available via the GCL command EXEC_PG and the GCL commands which call the GCOS 7 utilities.

You can specify use of UFAS Booster BPB in the DEFi parameter of the GCL command EXEC_PG.

A.1   UTILITIES SUPPORTED IN GCL

UFAS Booster BPB is effective with the following data management utilities:

COMPARE_FILE / COMPARE_FILESET
>   on both the input files and the output file, provided that the files are not relative files in direct access.

LOAD_FILE / LOAD_FILESET
>   on the input or the output file, provided that the file is not a relative file in direct access.

PRINT_FILE / PRINT_FILESET
>   on the input file, except when KEYLOC specifies a secondary key.

RESTORE_FILE / RESTORE_FILESET
>   on the input file provided that it is a UFAS disk file.

SAVE_FILE / SAVE_FILESET
>   on the output file provided that it is a UFAS disk file.

SAVE_CATALOG / SAVE_DISK

RESTORE_CATALOG / RESTORE_DISK

SORT_FILE / MERGE

All Utilities   the PRTFILE (if UFAS) output file.

All Utilities   the COMFILE (if UFAS) input file.

Examples of Use of UFAS Booster BPB for Utilities (in GCL)

```
LDF <output-file> <input-file>  DEF=(BPB=10);

PRF <input-file>  DEF=(BPB=5);

CMPF <input-file1> <input-file2>
      DEF=(BPB=6)   TODEF=(BPB=6);
```

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