

ZCICSBMS.TXT

zCICS Basic Mapping Support

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This document outlines the extensions and facilities implemented in Z390\CICS. Please refer to the IBM Manuals on BMS usage.

The documentation for EXEC CICS SEND MAP, RECEIVE MAP and SEND CONTROL are in the Z390\CICS Application Programming Guide.

The following BMS facilities are not yet implemented:

- Support for devices outside the 3270 family
- Printers
- Extended Attributes and alternate screen size
- Dynamic Map Positioning
- Partitioning
- Paging

BMS Macros

1) DFHMSD -- Mapset definition and termination

Although DFHMSD is optional it is recommended that one is coded. A default set of values will be internally generated from the DFHMDDI macro if missing.

```
mapset DFHMSD TYPE=MAP/DSECT/FINAL
          MODE=IN/OUT/INOUT
          LANG=ASM/COBOL
          CTRL=
          CURSLOC=YES/NO
          STORAGE=AUTO
          TIOAPFX=YES/NO
          TERM=
```

Notes:

TERM= is supported but discarded

Errors:

- A MAXIMUM OF 3 OPERANDS ALLOWED IN CTRL
- CANNOT HAVE MORE THAN ONE DFHMSD MACRO
- INVALID CURSLOC -- cursloc
- INVALID LANG -- lang
- INVALID MODE -- mode
- INVALID STORAGE -- storage

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INVALID TIOAPFX -- tioapfx
INVALID TYPE -- type
MAPSET NAME IS MISSING
POSITIONAL OPERAND xxxx INVALID

2) DFHMDI -- Map definition

mapname DFHMDI TYPE=MAP/DSECT
MODE=IN/OUT/INOUT
LANG=ASM/COBOL
CTRL=
CURSLOC=YES/NO
SIZE=(24,80)
LINE=1
COLUMN=1
STORAGE=AUTO
TIOAPFX=YES/NO
JUSTIFY=

Notes:

TYPE and STORAGE are required here only if the DFHMSD macro is omitted.

Parameters TYPE, MODE, LANG, CTRL, CURSLOC, STORAGE and TIOAPFX can all be omitted if the settings specified in DFHMSD are correct for this map.

MODE may be specified as an override to DFHMSD.
This facility is an extension.

Any option(s) specified in CTRL will override all the options specified in DFHMSD.

For LINE and COLUMN, only numeric parameters are supported.

JUSTIFY is discarded.

Errors:

A MAXIMUM OF 3 OPERANDS ALLOWED IN CTRL
COLUMN CANNOT EXCEED nn
INVALID CTRL OPTION - ctrl
INVALID CURSLOC -- cursloc
INVALID MODE -- mode
INVALID SIZE -- size
INVALID TIOAPFX -- tioapfx
LINE CANNOT EXCEED nn

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MAPNAME IS MISSING
MSD AND MDI TYPE MISMATCH
POSITIONAL OPERAND xxxx INVALID

2) DFHMDF -- Field definition

fldname DFHMDF POS=n/(n,n)
LENGTH=
ATTRB=
JUSTIFY=
INITIAL=
XINIT=
PICIN=
PICOUT=
OCCURS=
GRPNAME=

Notes:

POS does not have to be in sequence.

If ATTRB is missing then ATTRB=(ASKIP,NORM) is assumed.

If protection or intensity parameters are missing then a sensible default is assumed.

A field specified as ATTRB=(UNPROT,NUM) will only accept digits 0-9. Some 3270 models also allowed dots and commas.

Extensive cross-checking is made, such that any 'unusual' map structure is flagged as an error. A peruse of the errors below give a good indication of these types of map structure.

Extensions:

ATTRB=(ALPHA) has been added as the opposite of NUM

XINIT=FF..

The dots are replaced by a hex code of a fill character.

This will generate an RA order to fill this field for its whole length.

eg.

Instead of coding INITIAL='_____'

Code XINIT=FF6D

PICIN and PICOUT

These are conventionally supported for zCOBOL.

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A special form is available for assembler which is described below:

The parameter is (almost) a standard edit word with some restraints.

Currently only numeric data can be subjected to PICIN/PICOUT.

PICOUT...

Operates for a SEND MAP, but not if MAPONLY is specified. Data is taken from the map structure and subjected to the edit word before being sent to the screen.

PICIN...

Operates for a RECEIVE MAP. The data received is subjected to the edit word and then passed to the application in the map structure.

Note that the resulting data may no longer be numeric.

The edit word has some strict rules at present. Suggested extensions are most welcome.

The first hex pair must be 40 (blank), 5C (asterisk), 5B (dollar) or 4D (open bracket). Blank and asterisk are fill characters, dollar and open bracket are float characters.

The remaining hex pairs can be 20 (digit select), 21 (significance starter), 4B (dot) or 6B (comma).

The number of 20 and 21's must be odd.

Examples...

PICOUT=4020216B202020
Data is 12345, displayed as 12,345

PICOUT=5B20216B202020
Data is 1234 , displayed as \$1,234

PICOUT=5C20216B202020
Data is 89, displayed as *****89

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PICIN is no different, just that it edits incoming data.

If the data to be processed is not numeric after being PACKed, a MAPFAIL/8 condition is raised.

IMG file

For each TYPE=MAP generation, a mapname.IMG file is generated. This gives a symbolic picture of the resulting screen and can be used for planning map changes.

See the file GUI6.IMG for a good example.

Errors:

A MAXIMUM OF 2 OPERANDS ALLOWED IN JUSTIFY
ADJACENT ATTRIBUTE AT POS nnn
ATTRIBUTE CONFLICT - ALPHA AND NUM
ATTRIBUTE CONFLICT - ASKIP AND ALPHA
ATTRIBUTE CONFLICT - ASKIP AND NUM
ATTRIBUTE CONFLICT - ASKIP AND PROT
ATTRIBUTE CONFLICT - ASKIP AND UNPROT
ATTRIBUTE CONFLICT - BRT AND DRK
ATTRIBUTE CONFLICT - BRT AND NORM
ATTRIBUTE CONFLICT - NORM AND DRK
ATTRIBUTE CONFLICT - PROT AND UNPROT
BAD LENGTH - length
BOTH INITIAL AND XINIT ARE SPECIFIED
CONFLICTING JUSTIFY PARMS
GRPNAME AND OCCURS ARE SPECIFIED
GRPNAME SPECIFIED WITHOUT FLDNAME
IC ATTRIBUTE HAS OCCURRED IN ANOTHER MDF MACRO
INITIAL/XINIT IS GREATER THAN LENGTH
INITIAL/XINIT IS INVALID WITH LENGTH=0
INVALID ATTRB OPTION - attrb
INVALID JUSTIFY OPTION - justify
INVALID OCCURS - occurs
INVALID POS - pos
JUSTIFY CONFLICT - BLANK AND ZERO
JUSTIFY CONFLICT - LEFT AND RIGHT
LENGTH=0 IS INVALID FOR NAMED FIELD
PICIN/PICOUT CAN ONLY BE SPECIFIED FOR A NAMED FIELD
PICIN/PICOUT HAS ODD NUMBER OF HEX DIGITS
PICIN/PICOUT HEX LENGTH NOT EQUAL TO LENGTH
PICIN/PICOUT IS INVALID
PICIN/PICOUT: 1ST PAIR NOT 40, 5C, 5B, 4D
PICIN/PICOUT: NUMBER OF 20/21 IS NOT ODD

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POS nnn OVERLAPS WITH ANOTHER FIELD
POS COLUMN+LENGTH EXCEEDS DEFINED MAP SIZE
POS EXCEEDS DEFINED MAP SIZE
POS HAS TOO MANY PARAMETERS
POSITIONAL OPERAND xxxx INVALID
SINGLE POS EXCEEDS DEFINED MAP SIZE
SPECIAL FORMAT XINIT CANNOT BE SPECIFIED IF LENGTH IS LESS THAN 8
UNNAMED FIELD HAS UNPROT OR FSET, INPUT DATA CANNOT BE MAPPED
XINIT HAS ODD NUMBER OF HEX DIGITS

The following errors occur owing to internal limits.
Please report them.

AN INTERNAL ERROR HAS OCCURRED
ERROR IN ATTRIBUTE TABLE nnnn

AN INTERNAL ERROR HAS OCCURRED
MAPSIZE TOO LARGE - nnnn

AN INTERNAL ERROR HAS OCCURRED
PICIN/PICOUT LENGTH GREATER THAN 50 BYTES

Map generation

See the sample generation for MAP01 embedded in DFHALL.BAT.
This generates the TYPE=DSECT (MAP01.CPY) and the TYPE=MAP
(MAP01.390).

For LANG=COBOL, the structure will have a .CPZ suffix.
This suffix is the default for the zCOBOL COPY statement.

As the program name is the same, the TYPE=DSECT assembler output is
renamed mapset.PR1.

Change Summary

February 21, 2009
Added LANG=COBOL and mention of the .CPZ suffix
Added commentary separating PICIN/PICOUT by language

November 24, 2008
Added comment about POS
TIOAPFX is fully supported
TERM is supported but discarded
Extra error checking for LINE/COLUMN

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Author : Melvyn Maltz
Shipping Date: February 21, 2009
Z390 version : V1.5.00
zCICS version: V7

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