IBM®

Quick Reference Template

for

File Manager/DB2® for **IBM z/OS®**
Version 6.1

(program number 5655-P17)

Web-site:
http://www.ibm.com/software/awdtools/filemanager

Please refer to the User's Guide and Reference for full product documentation.

SC18-9380 - User's Guide and Reference
SC18-9381 - DB2 Feature User's Guide and Reference
GC18-9378 - Customization Guide

File Manager / DB2 Introduction

You navigate around File Manager DB2 panels in the same way as any other panels under ISPF. However, since File Manager DB2 has its own "primary option menu", if you use an = (equal sign) to prefix an option number in File Manager DB2, then you go to that option number under File Manager DB2, not the option under the ISPF Primary Option Menu.

For example, if you enter =3.4 on a File Manager DB2 panel, then you go to File Manager DB2 option 3.4, not ISPF option 3.4.

DB2 SSID shows the ID of the DB2 subsystem to which FM/DB2 is currently connected. To select a DB2 subsystem, you can overtype the ID of DB2 subsystem currently shown in the DB2 SSID field with the ID of the active DB2 subsystem you want, and press Enter. If you enter an asterisk (*), or blanks, in the DB2 SSID field and press Enter. FM/DB2 displays a list of all the DB2 subsystems in your environment from which you can select the DB2 subsystem you want. Entering a partial ID, starting or ending with an asterisk (*), or enclosed within two asterisks, in the DB2 SSID field and pressing Enter. FM/DB2 displays a restricted list of DB2 subsystems from which you can select the DB2 subsystem you want.

SQL ID The SQL ID for the current user. By default, this entry field is displayed with your SQL ID already entered. If you are authorized to use an SQL ID other than your own, you can enter an alternative SQL ID in this field.

Option   Description

0   settings – Set Processing options
0.1   use this panel to enter basic system options such as uppercase translation, display, encapsulation, catalog and template options and also time formats
0.2   the Set Batch Job Card Information panel lets you specify batch job card information to be used for generating batch job submission JCL
0.3   set individual or global Browse or Edit options
0.4   set individual or global copy options
0.5   specify the default options to be used when FM/DB2 generates JCL for the DB2 LOAD utility
0.6   specify processing options that affect the way FM/DB2 produces print output, such as where print output is to be directed and the name of the temporary print data set used when output is directed to SYSOUT
0.7   the DB2 / PL/I record description is provided in a copybook that FM/DB2 processes to produce a template. You can use this panel to specify the default language you want to use for such copybooks
0.8   specify additional SYSLIB data sets that the COBOL compiler might need when compiling the record description. You can also use this panel to specify the COBOL compiler DBCS option
0.9   use to specify additional SYSLIB data sets that the PL/I compiler might need when compiling the record description. You can also use this panel to specify certain PL/I compiler options
0.10   general ISPF options

Option   Description   (cont)

1   Browse – Browse DB2 table or View

2.   Edit – Edit DB2 table
    You can use Edit to view the contents of a DB2 table or view, and if necessary, to change the data. Changes to DB2 data will only be successful if DB2 accepts the changes made in the edit session

3   Utilities – Perform Utility Functions
3.1   print the contents of a DB2 table or view
3.2   create and drop DB2 objects
3.3   copy data between DB2 tables
3.4   use to specify:
- Whether you want the list of objects displayed or printed
- The type of object you want listed or printed
- Criteria to restrict the objects listed or printed
- Options to apply when processing the listed objects
3.5   display, grant, and revoke DB2 privileges
3.6   import data from a QSAM or VSAM data set to a DB2 table or view
3.7   export data from a DB2 table or view to a partitioned, sequential or VSAM data set
3.8   populate a DB2 table with data
3.9   load, copy, rebuild, recover, reorganize, and gather statistics on DB2 objects
3.10   print an audit trail report using the contents of the audit trail data set
3.11   browse, and optionally purge, the print output from your current FM/DB2 session held in the print data set

4   SQL - Prototype, Execute and Analyse SQL
4.1   build and run a simple SQL SELECT statement
4.2   build and run a complex SQL SELECT statement
4.3   enter freeform SQL statements, run them, or obtain information about an SQL statement
4.4   use this panel to:
- initiate an ISPF edit session on a data set or PDS member containing SQL statements
- run the SQL statements in a data set or PDS member
4.5   use this panel to select functions to support the use of the SQL EXPLAIN statement

5   DB2I - Start DB2 Interactive
5.1   process SQL statements using SPUFI
5.2   generate SQL and source language declarations
5.3   prepare a DB2 application program to run
5.4   Invoke the DB2 precompiler
5.5   BIND, REBIND, or FREE plans or packages
5.6   RUN an SQL program
5.7   Issue DB2 commands
5.8   Invoke DB2 utilities
5.9   set global DB2I parameters
5.X   leave DB2I

X   Leave **File manager** DB2

COPYBOOKS & TEMPLATES

How FM / DB2 uses the information in a copybook:
FM / DB2 is used to manipulate each 01-level group item in a copybook as a record type and each of its subordinate elementary data items as a field in that record type. FM / DB2 uses these data description entries to format your data.

How FM / DB2 compiles a copybook into a template:
When you specify a copybook, FM / DB2 checks whether the copybook is a complete source program or contains only COBOL data declarations or PL/I Declare statements. If the copybook is not a complete program, FM / DB2 includes the copybook in a shell program, (FM / DB2 ignores everything in the copybook except for COBOL data description entries or PL/I DECLARE statements). It then invokes the COBOL or PL/I compiler to check the syntax of the copybook and to produce an ADATA file. This is then used to create the template.

FM / DB2 supports the following COBOL data description entries:
. ASSIGN
. OCCURS (incl. OCCURS DEPENDING ON
. PICTURE (except for numeric editing)
. REDEFINES
. RENAMES
. USAGE
. VALUE

Templates
An FM/DB2 template is a collection of information that you can use to select and format tables and columns in a DB2 object. FM/DB2 functions that interface with non-DB2 data can use the Import (from a VSAM or QSAM dataset), Export (for VSAM, sequential or PDS member, and the DB2 LOAD utility (from sequential and PDS members)

With templates, you can:
. Manipulate columns
. Map data
. Select rows
. Create data

You can use templates to perform the following actions on data:-
browse, edit, copy, create, compare, print, import, export, load

Information stored in a template covers:
Column selection, Column sequence, Column headings, Column fixed attributes, Column use attributes, column create attributes and column mapping.

Prefix commands during an Edit Template session (cont)

S, SS, Sn, S*	for selecting (or deselecting) columns to be displayed in a browse or edit session
H,HH, Hn	for holding (or freeing) columns so that they are always displayed when scrolling
E	for changing the attributes of a column, i.e. output width, leading zeroes, values for new columns

FILE MANAGER Primary Commands (Edit)

The following commands are available in Edit mode in addition to the Browse primary commands.

CAPS:	translate data to uppercase (similar to ISPF editor CAPS command)
CASE:	translate to uppercase all data in any new or changed rows, regardless of how the rows are changed
CHANGE:	find and replace one or more occurrences of a character string. In SNGL or TABL display format, you can also use the CHANGE command to find and replace a numeric value in numeric fields
DELETE:	delete rows
EXCLUDE:	exclude rows from display (in TABL mode)
PREFIX:	sets the position and display state of the prefix area (In TABL mode)
RCHANGE:	repeat the previous CHANGE command
REDIT:	display an edit session
RESET:	reset pending prefix commands, remove labels and Redisplay excluded rows
SAVE:	save changes without ending the edit session

FILE MANAGER Primary Commands (Browse & Edit)

BOTTOM:	scroll to the last page of data
CANCEL/QUIT:	quit the current edit session without saving
DOWN:	scroll down (forward) through your data
END/FILE:	save changes to the data set and end the edit session
FIND:	search the data for a character string or (in SNGL or TABL display format only) a numeric field with a particular numeric value

Find parm1 string #cl label1 label2 parm2

parm1	- NEXT / ALL / PREV / LAST / FIRST
#cl	- restrict search to one or more specified columns. e.g. (#1 #2) or #1,#2
label1	- start of a range of rows (in edit)
label2	- end of a range of rows (in edit)
parm2	- X / EX for excluded or NX not excluded rows only (in edit)

FILE MANAGER Primary Commands (Browse & Edit) (cont.)

FORMAT:	toggle between tabular display format (TABL) and single-row display format (SNGL). The FORMAT primary command has the same effect as changing the Format field (in the upper right hand corner of the panel).
FS:	change the format to SNGL mode
FT:	change the format to TABL mode
HEX:	set or reset the hexadecimal display in all formats
INDEXINF:	shows or hides index information about each column if displayed in SNGL display format
LEFT:	scrolls to the left of your data
LOCATE:	scrolls to the specified row or first column
NEXT:	scrolls forward the number of rows specified
PB:	browse and/or purge print output
PREVIOUS:	scrolls backward the number of rows specified
RD:	prints the current record in dump format
REFS:	shows or hides the column number (in SNGL mode)
RFIND:	repeats the search performed by the previous FIND command
RIGHT:	scrolls to the right of your data
RP:	prints the current row
SHADOW:	hides or shows shadow lines
SORT:	changes order of data (in TABL mode)
SQL:	displays the SQL SELECT statement
TEDIT:	edits the template
TOP:	scrolls to the first page of data
TYPE:	shows or hides the data type (in SNGL mode)
UP:	scrolls up (backward) through your data
ZOOM:	shows all columns in the row in "zoomed" SNGL mode. In TABL mode zooms in on the row selected by the cursor, or the top row displayed if the cursor is not positioned on a row. In SNGL display format, the ZOOM command shows the current row

Prefix Commands (edit only)

You can enter the following commands in the prefix area of the data display:

A identifies row after which data is to be moved / copied

B identifies row before which data is to be moved / copied

C, Cn, copy one or n rows

CC copy a block of rows (mark start and end with **CC**)

D, Dn, delete one or n rows

DD delete a block rows (mark start and end with DD)

E display a panel containing information about why a change to this row failed. The E command is only valid if a row is marked in error. (Rows marked in error have "=ERR", "ERR R", or the SQLCODE in the prefix field)

F, Fn display the first or n rows of a block of excluded rows

FS change format to SNGL and scroll selected row to top

G get the data saved on the clipboard. (Rows saved on the Clipboard with the S, Sn or SS prefix commands can only be retrieved from the clipboard with the G prefix command during the same edit session. The clipboard is a temporary memory buffer that is cleared when you exit from the DB2 Edit function panel (and FM/DB2 returns you to the Primary Option Menu)

I insert one row*. The row is initialized using the row description of the currently displayed row. For each column, if it has a default value (DEFAULT="value", and not just the DEFAULT keyword), it is initialized to that value. Otherwise, the column is initialized according to its data type:-

Character strings	Set to blanks
Numeric	Set to zeros
Row identifier	Set to blank
DATE	Set to the current date
TIME	Set to the current time
TIMESTAMP	Set to the current date and time

 * **Note**: If a column of the inserted row can contain a null value, it is set to the null value and the null column display indicator is displayed in the displayed column

In insert n empty rows

IP insert a primary key. In an Edit session of a related parent table only, insert a row with the key columns set to the key value that originally caused the error in the dependent table of the relationship

IPn insert n primary keys. In an Edit session of a related parent table only, insert n rows with the key columns set to the key value that originally caused the error in the dependent table of the relationship. If you attempt to save the data, it results in duplicate key errors for the second and all subsequent inserted rows, as primary key values must be unique

L, Ln display the last or last n, rows of a block of excluded rows

Prefix Commands (edit only) (cont.)

LC, LCn convert all uppercase characters in a row or n rows to lowercase *

LCC convert all uppercase characters in a block of rows to lowercase. (Mark start and end of block) *
* Note: The LC (LCn, LCC) command affects all characters in a row, not just characters in columns with a CHAR or VARCHAR data type. Therefore, numeric data, such as binary data or packed decimal data can be corrupted if you use these commands

M, Mn move one row or n rows

MM move a block of rows (mark start and end of block).

P identifies the row preceding which data is to be moved or copied

R or " repeat one row

Rn or "n repeat n rows

RR repeat a block of rows (mark start and end with **RR**)

RE edit a related table
You can use the RE prefix command to edit the related table if the row is marked with an error caused by a referential constraint. You can only enter the RE prefix command against a row marked in error, where the rightmost position of the prefix area contains an "R". RE starts another FM/DB2 dependent edit session, in a new ISPF logical session. The new (dependent) FM/DB2 Edit session is for the related table in the relationship that caused the referential constraint error. **Note:** If you use the RE prefix command for a row whose prefix area contains "=ERR R", take care to avoid the editor interpreting the RE command as an R prefix command instead by ensuring the "RE" is followed by one or more blanks). After you use the RE command to edit a related table, you cannot save data until you end the dependent Edit session(s) of the related table(s)

S, Sn save one or n rows on the clipboard

SS save a block of rows on the clipboard. (Mark start and end of block with SS)

UC,UCn translate one or n row contents to upper case

UCC translate a block of rows contents to upper case. (Mark start and end of block with **UCC**)
Note: The UC (UC*n*, UCC) command affects *all* characters in a row, not just characters in columns with a CHAR or VARCHAR data type. Therefore, numeric data, such as binary data or packed decimal data can be corrupted if you use these commands

X, Xn exclude one or n rows from display

XX exclude a block of rows from display (mark start and end with **XX**). If the display of excluded row shadow lines are enabled (see SHADOW command); a shadow line will be shown indicating how many rows are being excluded at this position

.xxxx label a row. The label, "xxxx", is a character string 1 to 4 characters long, that does not start with the character "z" (labels starting with "z" are system labels). Labels can be assigned to any row. Labels cannot be assigned to shadow lines

Dislay Formats

If you browse or edit data, you can view the data in the following display formats:
- Tabular format (**TABL**), or
- Single-row format (**SNGL**)

To select the display format you want, you can:
- Enter one of the following values (or just its first letter) in the Format field (in the upper right corner of the Table Browse or Table Edit panel):
  - ➢ TABL
  - ➢ SNGL
- Use the FORMAT primary command to toggle between TABL and SNGL display formats
- In TABL display format, use the FS primary command to change to SNGL display format
- In SNGL display format, use the FT primary command to change to TABL display format

In **TABL** display format (the default format), the rows of the table are presented formatted into columns displayed horizontally across the panel. Multiple rows are displayed on the one panel (limited by the screen size). Each column of the table is formatted according to the data type for that column. If you display data in **TABL** display format, you can scroll up, down, left, and right.

In **SNGL** display format, only one row of the table is displayed on the panel at the one time. The columns of the table are displayed vertically on the panel, with the column header on the left of the panel, and the data for that column on the right. Each column of the table is formatted according to the data type for that column.
If you display data in **SNGL** display format, you can:
- Scroll within the row (up and down)
- Scroll forward and backward within the table (to show the next and previous non-excluded rows)

FM/DB2 supports the following IBM-supplied data types:

Character strings (alphanumeric)
A sequence of bytes where the length of the string is the number of bytes in the sequence.
- **CHAR** Fixed-length character string
- **VARCHAR** Varying-length character string
- **GRAPHIC** Fixed-length graphic string
- **VARGRAPHIC** Varying-length graphic string

Numeric
Decimal, binary integer and floating point data types containing a sign and a precision.
- **DECIMAL** or **NUMERIC** A packed decimal number with an implied decimal point
- **SMALLINT** A binary integer with a precision of 15 bits
- **INTEGER** A binary integer with a precision of 31 bits
- **REAL** A single precision floating-point number (32 bits)
- **DOUBLE**, **DOUBLE PRECISION**, or **FLOAT** A double precision floating-point number (64 bits)

Utilities

Export Utility

Used to export data to a PDS, Sequential or VSAM dataset using FM / DB2 in one of 3 formats:

- DB2 (FM Internal). Recommended if the data is to be imported into another DB2 using the FM / DB2 Import utility
- Comma-Delimited (CSV. This format is not supported by the Import utility
- COBOL or PL/I copybook layout. User defined template must be used

Output Uses:

- as input to FM / DB2 utility. Supports data in DB2 format, COBOL or PL/I copybook format
- as input to PC-based spreadsheet application program in the form of a Comma-delimited (CSV) file.
- COBOL, PL/I or other user application

On Export, in addition to specifying the format, you are also able to;-

- select the columns to be exported
- reformat data by mapping table columns to fields in output PDS, Sequential or VSAM dataset
- create and save a COBOL or PL/I template that describes the exported data
- select which rows to export
- specify number of rows
- specify whether it's to be run in foreground or batch

Import utility

Used to input data from a QSAM or VSAM dataset, produced by the FM / DB2 utility or any external source, into a DB2 Table or View. A COBOL or PL/I copybook or template must be specified that describes the record format of the data. If a copybook is specified, FM / DB2 compiles it to produce a template.

On Import, you are able to

- reformat the data by mapping the DB2 Table columns to the fields in the input dataset (as defined by the COBOL , PL/I copybook or template
- use a REXX procedure to enhance the way in which data is selected and reformatted
- specify the number of rows to input
- specify whether to run in Foreground or Batch
- specify that any duplicate rows are to be updated with the vales in the imported row

The Import Utility provides one method for moving DB2 data between different DB2 sub-systems (that is, export on one sub-system followed by import on another). If you want to move data between tables in the same DB2 sub-system, either the FM/DB2 Copy utility or direct execution of SQL statements is typically more convenient. The Import Utility is not intended as a substitute for the DB2 utilities if unloading or migrating large volumes of data, and the DB2 utilities will offer superior performance in these situations. Run import operations in batch wherever possible.

Import Utility (cont)

Use the "Update existing rows" option to replace and update data in a table if the only changes to the data are in non-unique index columns. If this option is selected, specify a DB2 table name, rather than a view name, for the target object. FM/DB2 does not attempt to import data into a view defined on a view. However, it will attempt to update a view defined directly on a single table. The import utility provides for automatic mapping of the DB2 null indicator, regardless of the format of the imported data. However, the template editor does not show the null indicator as a separate item in the "From" template on the Field Mapping panel. It is therefore not possible to re-map the null indicator associated with nullable columns to a column in the target table.

REXX

External REXX FUNCTIONS

FM/DB2 provides the following external REXX functions that you can use, in addition to the built-in REXX functions described in the OS/390 TSO/E® REXX Reference.

CHANGE	change a character string
CONTAINS	check for character values
FLD	refer to a field from the current input record
NCONTAIN	check for numeric values
PRINT	print a record
PRTCOUNT	count of records printed
RECSIN	count of records read
RECSOUT	count of records written to a given data set
TALLY	total a field value and report the total
TM	test a string for a bit value
WRITE	write a record

Note: You can only use these FM/DB2-specific REXX external functions, and the INREC and OUTREC variables, in a REXX procedure specified by the **Use REXX** proc field. You cannot use these functions and variables in REXX procedures outside of this FM/DB2 environment.

REXX Comparison operators

=	Equal
¬=, \=	Not equal
<	Less than
¬<, \<	Not less than
>	Greater than
¬>, \>	Not greater than
<=	Less than or equal to
>=	Greater than or equal to
><	Greater than or less than (same as not equal)
<>	Less than or greater than (same as not equal)
==	Strictly equal
¬==, \==	Strictly not equal
<<	Strictly less than
¬<<, \<<	Strictly not less than
>>	Strictly greater than
¬>>, \>>	Strictly not greater than
<<=	Strictly less than or equal to
>>=	Strictly greater than or equal to

Setting Global Options

Use the Set Processing Options menu to set various types of options that affect the behaviour of FM/DB2 panels.

Edit/Browse options (option 0.3)

The options for Edit and Browse span over 4 individual panels and provide 2 levels of customisation, one at a global level, i.e. for the duration of the complete FM/DB2 session and one temporarily for the individual browse/edit session. The individual selection will override any conflicting Global option.

- **Panel 1** - you set the maximum number of rows to receive from a query, the display options, when and where to show the prefix area and if to show excluded shadow lines or not. You also specify here whether you wish to move to any of the further options panels (via PF11)
- **Panel 2** - Commit options are entered that enable you to perform an implicit save when Enter key hit, either committing the changes whenever data is saved or at the end of the edit session. You can also commit changes to DB2 if errors were encountered during Save processing, or restrict commit processing if there were no save errors. Panel 2 also gives you the option of removing trailing spaces from VARCHAR input fields and optionally delimiting them with a special character, if the data is not of maximum length. Options to convert spaces to nulls where nulls are allowed and display characters to use when dealing with nulls are also specified here
- **Panel 3** enables you to alter the output format of both TABL and SNGL display formats, whether to allow updates to the primary key and whether it, along with foreign key and index indicators, are also displayed on the screen. There is also the option to display the SQLCODE in the prefix area if an error is encountered when attempting to save the changes
- **Panel 4** is used to specify Concurrency and Locking options. In essence specifying a high value for concurrency reduces the likelihood of deadlocks when editing an object, (at the expense of other users' ability to access and change data). FM/DB2 also provides options here to lock the table to prevent update or read access from other users. Concurrency options affect the way DB2 takes row and page locks whereas Locking options affect the way DB2 takes table locks. Using Locking results in FM/DB2 explicitly issuing a lock against the entire DB2 table. If the Locking option is used, concurrency options are ignored. Concurrency and locking options apply to the initial fetch of data from DB2 only and that after every commit; the lock on the table is released. There is also an option to create an Audit trail report for edit processing