

**HEM – HOST Exit Manager – Version 1, Release 9  
Level 0**

**User's Guide**

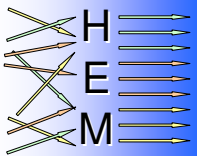
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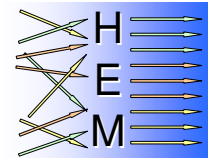
# HEM – HOST Exit Manager User's Guide

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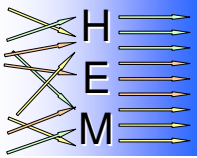




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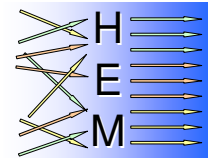




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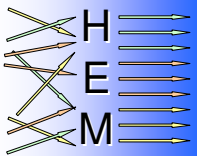
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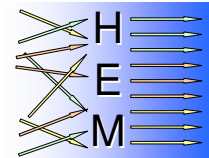




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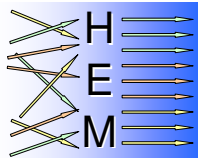
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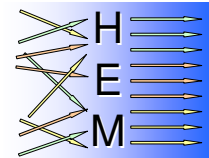
## 1 HEM – HOST Exit Manager – Overview

**HEM – HOST Exit Manager** has been developed to provide mainframe DP centers with an easy but very powerful product to check and enforce host standards. The checks and enforcement are defined and controlled using an ISPF Application – which passes all the required information as filter and set statements to standard MVS and JES2 Exits.

HEM supports the following functions:

- 01 Jobname Check
- 02 Job Account Code Set
- 03 Job Account Codes Check
- 04 Job Jobclass Set
- 05 Job Jobclass Check
- 06 Job Msgclass Set
- 07 Job Programmer Name Set
- 08 Job System Set
- 09 Job Duplicate Check
- 10 Job Input Priority Set
- 11 DD Dsname Set
- 12 DD Duplicate Check
- 13 Job System Check
- 14 Job CPU Time Limit Set
- 15 Step Region Set
- 16 DD Line Limit Set
- 17 Step CPU Time Ext. Set
- 18 Step Wait Time Ext. Set
- 19 DD Line Extension Set
- 20 DD Sysout Set
- 21 DD Output Priority Set
- 22 DD Outdisp Set
- 23 Step Abend Set

HEM provides a started task, which must be started at IPL, as well as JES2, SMF and subsystem interface exits for the various functions. HEM can produce SYSLOG/Joblog and/or SMF records to inform the users about actions taken by the exits or to audit the functions and their utilization.



## 2 HEM – ISPF

The HEM ISPF application is started through a call of the HEMST gateway – V HEMST:

```
Menu  Utilities  Help
-----
                                HEM - HOST Exit Manager
Option ==>
    > Type B - to set Base Options
    > Type M - to set Member Defaults
    > Type O - to set Exit Options
    > Type I - to display Change Information
    > Type S - to display SMF Records

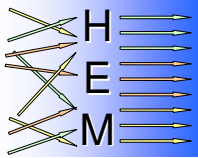
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```

**Figure 1: HEM – Primary Panel – HEMPRIM**

The primary panel supports the following options:

1. **B** – to set Base Options – Definition of the two base datasets, see 2.1 Base Options – B on page 1. The base datasets have to be defined prior calling any other function
2. **M** – to set Member Defaults – Definition of the Parmlib member names, see 2.2 Member Defaults – M on page 7. This Function is optional; defaults are given through HEM for all selectable functions or are read from the \$HEMMEMB Parmlib member
3. **O** – to set Exit Options – this is the major option of HEM. All options for the different functions will be defined, set, changed, shown... see 2.3 Exit/Function Options – O on page 10
4. **I** – to display Change Information – Display of the last date/time/userid of the function changes, see 2.4 Display Change Information – I on page 18
5. **S** – to display SMF Records – Display of the formatted SMF Records, see 2.5 Display SMF Records – S on page 19.
6. The **Help** pull down menu can be used to select one of the help panels.





## 2.1 Base Options – B

The Base Options are used to specify the two required HEM control datasets:

1. PDSE Loadlib Dataset – this dataset has to be defined with the following characteristics:
  - a. Organization . . . . : PO
  - b. Record format . . . . : U
  - c. Record length . . . . : 0
  - d. Block size . . . . : 32760
  - e. 1st extent tracks . : 30 (Minimum)
  - f. Secondary tracks . : 0 (no extention)
  - g. Data set name type : LIBRARY (Required!)
2. PARMLIB Dataset – the following characteristics could be used:
  - a. Organization . . . . : PO (could also be a PDSE)
  - b. Record format . . . . : FB
  - c. Record length . . . . : 80
  - d. Block size . . . . : 27920 (every Blocksize OK)
  - e. 1st extent tracks . : 15 (Minimum)
  - f. Secondary tracks . : 15 (Minimum)
  - g. Directory Blocks . : 46 (other Dir Blocks OK)

### 2.1.1 PDSELIB

The PDSE Loadlib contains the following members:

1. HEMFN##A and HEMFN##B (## = 01 to 23): HEM filter of the functions. For every function there are two members; they will be loaded alternatively within the LPA (*Link Pack Area*). The members are created by Translate, described 2.3.1.5 T – Translate on page 12. After HEM Installation only the „A“ version of the members will exist and they will produce a „no selection condition“
2. HEMCURRE: this load module has three parts:
  - a. HEMCURRE CSECT: Pointers to the following CSECTs
    - i. HEMGOPTS, HEMFX## (## = 01 to 23)
  - b. HEMGOPTS CSECT: HEM Global Options
    - i. 4 Status Bytes for every function:
      1. Byte Flag 1:

a. MODE_SIM	EQU	X'08'
-------------	-----	-------
      2. Byte Flag 2:

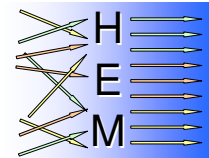
a. MSG_INFO	EQU	X'03'
b. MSG_ERROR	EQU	X'02'
c. MSG_NONE	EQU	X'00'
      3. Byte Flag 3:

a. SMF_INFO	EQU	X'03'
b. SMF_ERROR	EQU	X'02'
c. SMF_NONE	EQU	X'00'
      4. Byte Flag 4:

a. MODE_ACT	EQU	X'80'
-------------	-----	-------
    - ii. Statistical information about the last change to the global options – 28 Bytes:

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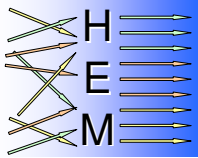


1. Date: yyyyymmdd
2. Time: hh:mm:ss.hh
3. Userid
- c. one HEMFX## CSECT (## = 01 to 23) per function with statistical information about last change/translate:
  - i. Function name: HEMFUN##
  - ii. Date: yyyyymmdd
  - iii. Time: hh:mm:ss.hh
  - iv. Userid
3. HEMFX## (## = 01 to 23): these are the load modules, which are linked together within HEMCURRE
4. HEMGOPTS: this load module is linked within HEMCURRE
5. HEMMAIN: the „Main-Filter-Module“ – Every exit calls HEMMAIN to check if any selection/exception has to be made. HEMMAIN uses the filter modules HEMFN01A/B to select/except the job
6. HEMTRACE: the trace module of HEM, see Trace on page 114
7. HEMROPTS and HEMRFX: two programs to read HEMGOPTS and the HEMFX## modules within the ISPF-REXX HEM interface (see 2.4 Display Change Information – I on page 18)
8. HEMSFR: the Subsystem module for function 23 – Step Abend Set (Subsystem Functional Routine)

Member	ISPF	Started Task
HEMFN##A HEMFN##B	Created through Translate	Dynamically loaded in LPA at cold start or after Translate
HEMCURRE	Created through Translate	Loaded/read every 10 seconds to check possible changes
HEMFX##	Created through Translate part of HEMCURRE	
HEMGOPTS	Created through Global Changes part of HEMCURRE	
HEMMAIN		Loaded in LPA at cold start Pointer in HEM CSA CB
HEMROPTS	Option I – Display Change Info Read/Load HEMGOPTS	
HEMRFX	Option I – Display Change Info Read/Load HEMFX##	
HEMSFR		Loaded in LPA at cold start Part of HEMS Subsystem Used by function 23
HEMTRACE		Loaded in LPA at cold start Pointer in HEM CSA CB

**Figure 2: PDSELIB member usage**





## 2.1.2 PARMLIB

The HEM PARMLIB uses the following members:

1. \$HEMMEMB: used to store the name of the function members. \$HEMMEMB will be created using the HEM ISPF function M – set Member Defaults (see 1 HEM – HOST Exit Manager on page 1). Please DO NOT create/change this member using the ISPF editor – please always use HEM ISPF interface!
2. All other members can have any possible member name. HEM will propose default member names for all functions (see 2.2 Member Defaults – M on page 7). Other member names will be defined using the HEM ISPF function M – set Member Defaults (see 2.2 Member Defaults – M on page 7). The contents of the members can be edited using the HEM ISPF interface Option O – set Exit Options (see 2.3 Exit/Function Options – O on page 10) – or using the ISPF editor.

```
Menu  Utilities  Help
-----
                                HEM - HOST Exit Manager - Base Definition
Option ===>

- Enter PDSE Dataset Name - Loadlib
  PDSE : 'YCOS.HEM.PDSELIB'

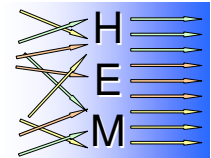
- Enter Parmlib Dataset Name
  Parm : 'YCOS.HEM.PARMLIB'

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```

Figure 3: HEM – Base Options Panel – HEMBASE

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The given names will be checked and saved when you press „Enter“:

```
Menu  Utilities  Help
-----
HEM - Host Exit Manager - Base Defi          PDSE and PARM OK
Option ==>

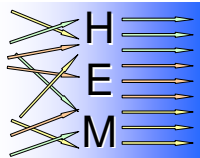
- Enter PDSE Dataset Name - Loadlib
  PDSE : 'YVES.HEM.PDSELIB'

- Enter Parmlib Dataset Name
  Parm : 'YVES.HEM.PARMLIB'

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```

**Figure 4: PDSELIB and PARMLIB check**





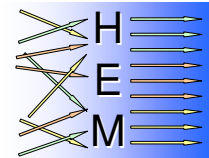
## 2.2 Member Defaults – M

The member names for the different functions of HEM can be defined using Member Defaults – Option M. The following defaults will be used by HEM:

Function	Member Name
01 Jobname Check	JOBNAME
02 Job Account Code Set	ACCOUNTS
03 Job Account Codes Check	ACCOUNTC
04 Job Jobclass Set	JOBCLASS
05 Job Jobclass Check	CLASS
06 Job Msgclass Set	MSGCLASS
07 Job Programmer Name Set	PGMRNAME
08 Job System Set	SYSSET
09 Job Duplicate Check	MASCHECK
10 Job Input Priority Set	PRIORITJ
11 DD Dsname Set	DSN
12 DD Duplicate Check	DDDOUBLE
13 Job System Check	SYSCHECK
14 Job CPU Time Limit Set	TIMELIMI
15 Step Region Set	REGION
16 DD Line Limit Set	LINESDD
17 Step CPU Time Ext. Set	ADDTIME
18 Step Wait Time Ext. Set	ADDWAIT
19 DD Line Extension Set	EXTLINES
20 DD Sysout Set	SYSOUT
21 DD Output Priority Set	PRIORITY
22 DD Outdisp Set	OUTDISP
23 Step Abend Set	SETUABEN

**Figure 5: PARMLIB default member name**

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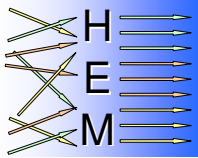


```
Menu Utilities Help
-----
HEM - HOST Exit Manager - Member Defaults
Option ==> _____ Scroll ==> CSR
01 Jobname Check          JOBNAME   - 02 Job Account Code Set    ACCOUNTS
03 Job Account Codes Check ACCOUNTC - 04 Job Jobclass Set       JOBCLASS
05 Job Jobclass Check     CLASS     - 06 Job Msgclass Set       MSGCLASS
07 Job Programmer Name Set PGMRNAME - 08 Job System Set         SYSSET
09 Job Duplicate Check    MASCHECK - 10 Job Input Priority Set  PRIORITY
11 DD Dsname Set         DSN       - 12 DD Duplicate Check     DDDOUBLE
13 Job System Check      SYSCHECK - 14 Job CPU Time Limit Set TIMELIMI
15 Step Region Set       REGION   - 16 DD Line Limit Set      LINESDD
17 Step CPU Time Ext. Set ADDTIME  - 18 Step Wait Time Ext. Set ADDWAIT
19 DD Line Extension Set EXTLINES - 20 DD Sysout Set         SYSOUT
21 DD Output Priority Set PRIORITY - 22 DD Outdisp Set        OUTDISP
23 Step Abend Set        SETUABEN
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```

Figure 6: HEM – Member Defaults Panel – HEMMEMB







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Every change to the member names or using of the default settings will cause, the \$HEMMEMB member in the HEM PARMLIB to be recreated:

```
Menu  Utilities  Help
-----
HEM - Host Exit Manager - Member De          $HEMMEMB changed
Option ==> _____ Scroll ==> CSR

01 Jobname Check          JOBNAME    - 02 Job Account Code Set      ACCOUNTS
03 Job Account Codes Check ACCOUNTC - 04 Job Jobclass Set         JOBCLASS
05 Job Jobclass Check     CLASS      - 06 Job Msgclass Set        MSGCLASS
07 Job Programmer Name Set PGMRNAME - 08 Job System Set         SYSSET
09 Job Duplicate Check    MASCHECK - 10 Job Input Priority Set   PRIORITYJ
11 DD Dsname Set         DSN        - 12 DD Duplicate Check      DDDOUBLE
13 Job System Check       SYSCHECK - 14 Job CPU Time Limit Set  TIMELIMI
15 Step Region Set       REGION    - 16 DD Line Limit Set       LINESDD
17 Step CPU Time Ext. Set ADDTIME  - 18 Step Wait Time Ext. Set ADDWAIT
19 DD Line Extension Set  EXTLINES - 20 DD Sysout Set          SYSOUT
21 DD Output Priority Set  PRIORITY - 22 DD Outdisp Set         OUTDISP
23 Step Abend Set        SETUABEN

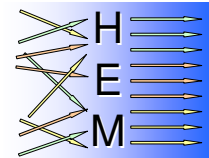
Copyright YCOS Yves Colliard Software GmbH - 2006-08 - V1.9.0
```

**Figure 7: Member names changes**

The \$HEMMEMB member will be created with ISPF statistics – the Userid will be HEM, so it can be differentiated from manual changes using the ISPF editor. The member will include the following information:

```
/* HEM - HOST Exit Manager          */
/* Member generated by REXX         */
/* Do NOT change this Member using an Editor! */
/* Last changed dd/mm/yy hh:mm:ss Userid   */
HEMF##='.....'
...
```





### 2.3 Exit/Function Options – O

The Exit/Function Options are the most used options within HEM. The following activities will be controlled through this panel:

```

Menu  Utilities  Help  Help F01-10  Help F11-23
-----
HEM - HOST Exit Manager - Function Options
Option ==>          Scroll ==> CSR
Edit/Parm,View,Browse,Trans,Check Act,Ina,Sim Inf,Err,Non mm/dd hh:mm Tracing
S Function          Member      Mode   Msg     SMF   Translate  Jobname
-----
01 Jobname Check      JOBNAMEY  A      I       I    06/04 20:53 HEMY1001
-- 02 Job Account Code Set  ACCOUNSY  A      I       I    01/01 00:00
-- 03 Job Account Codes Check ACCOUNCY  A      I       I    01/01 00:00
-- 04 Job Jobclass Set     JOBCLASY  A      I       I    01/01 00:00
-- 05 Job Jobclass Check   CLASSY    A      I       I    06/05 17:11 12345678
-- 06 Job Msgclass Set     MSGCLASY  A      N       I    01/01 00:00
-- 07 Job Programmer Name Set PGMRNAMEY A      N       I    01/01 00:00
-- 08 Job System Set       SYSSEY    A      I       I    01/01 00:00
-- 09 Job Duplicate Check  MASCHECY A      I       I    01/01 00:00
-- 10 Job Input Priority Set PRIORIYJ  A      N       I    01/01 00:00
-- 11 DD Dsname Set        DSN       A      I       I    06/07 19:11 HEMY1011
-- 12 DD Duplicate Check   DDDOUBLE  A      I       I    01/01 00:00
-- 13 Job System Check     SYSCHECK  A      I       I    01/01 00:00
-- 14 Job CPU Time Limit Set TIMELIMI  A      N       I    01/01 00:00
-- 15 Step Region Set      REGION    I      N       I    01/01 00:00
-- 16 DD Line Limit Set    LINESDD   A      N       I    01/01 00:00
-- 17 Step CPU Time Ext. Set ADDTIME   A      I       I    01/01 00:00
-- 18 Step Wait Time Ext. Set ADDWAIT   A      I       I    01/01 00:00
-- 19 DD Line Extension Set EXTLINES  A      I       I    01/01 00:00
-- 20 DD Sysout Set        SYSOUTY   A      N       I    01/01 00:00
-- 21 DD Output Priority Set PRIORITY  A      N       I    01/01 00:00
-- 22 DD Outdisp Set       OUTDISP   A      N       I    06/04 23:51
-- 23 Step Abend Set      SETUABEN  A      N       I    06/06 11:50 HEMSSIY2

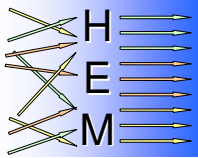
Copyright YCOS Yves Colliard Software GmbH - 2006-08 - V1.9.0
    
```

**Figure 8: Exit/Function Options – HEMOPTS**

The Help pull down menu, available on every HEM panel, has been extended; all function dependent helps can also be selected:

- Help F01-10: for functions 1 to 10
- Help F11-23: for functions 11 to 23.





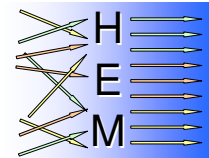
## 2.3.1 S – Selection

### 2.3.1.1 E – Edit

Edit the member to define/change Sets and Filters for the selected function (*S is a synonym and can also be used*)

```
File Edit Edit_Settings Menu Utilities Compilers Test Help
-----
EDIT          YCOS.HEM.PARMLIB(SYSOUT) - 01.99          Columns 00001 00072
Command ==>                                         Scroll ==> CSR
***** Top of Data *****
===== Member Changes: HEMFUN20 2006/11/12 18:17:28      YVES
===== Last Translate: HEMFUN20 2006/11/12 18:17:40.78  YVES
000001 *****
000002
000003 SET MODE=ACT SYSOUT=A WRITER=12345678 FORMS=F9876 DEST=NDST HOLD=NO
000004     JOB=HEMTALLF DD=SYSUT2
000005
000006 SET  MODE=ACT MSG=I SYSOUT=A
000007     JOB=HEMT2001 STEP=S1111
000008 *    JOB=HEMT2001 SYSOUT=Z
000009 *    JOB=HEMT2001 DD=SYSUT2
```

Figure 9: Exit/Function Options – E/S – Edit



### 2.3.1.2 P – Edit with parameter

Edit the member to define/change Sets and Filters for the selected function; all possible Set and Filter keywords will also be shown as „Notes“ within the display

```

File Edit Edit_Settings Menu Utilities Compilers Test Help
-----
EDIT          YCOS.HEM.PARMLIB(SYSOUT) - 01.99          Columns 00001 00072
Command ==>                                         Scroll ==> CSR
***** Top of Data *****
=====
Keywords supported by Function 20 DD Sysout Set
=====
Member Changes: HEMFUN20 2006/11/12 18:17:28      YVES
Last Translate: HEMFUN20 2006/11/12 18:17:40.78  YVES
=====
SET Keywords
-----
=====
MODE           SMF           MSG           SYSOUT
WRITER         FORMS          HOLD          DEST
=====
Filter Keywords
-----
=====
PGMRNAME       JOBCLASS      MSGCLASS      JOB
USER           GROUP         ANY_GROUP     DAY
TIME          SYSID         XMODE         PGM
STEP          DD            SYSOUT        LRECL
LINES         PAGES        UCS           FCB
WRITER        FORMS        DEST
000001 *****
000002
000003 SET  MODE=ACT SYSOUT=A WRITER=12345678 FORMS=F9876 DEST=NDST HOLD=NO
000004     JOB=HEMTALLF DD=SYSUT2
000005
000006 SET  MODE=ACT MSG=I SYSOUT=A
000007     JOB=HEMT2001 STEP=S1111
000008 *    JOB=HEMT2001 SYSOUT=Z
000009 *    JOB=HEMT2001 DD=SYSUT2

```

Figure 10: Exit/Function Options – P – Parameter

### 2.3.1.3 V – View

View the member to display Sets and Filters for the selected function

### 2.3.1.4 B – Browse

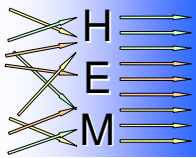
Browse the member to display Sets and Filters for the selected function

### 2.3.1.5 T – Translate

Translate the member of the selected function. A status bar will indicate the currently running step. The following steps will be needed to translate the member into a load module:

- „Allocation“: allocation of the needed datasets
- „Translation“: call of the HEMPARM REXX – syntax checking will be done and the following datasets will be created (*HEMERROR* in case of errors and *HEMSRCE/HEMSTMP* in case of a successful translate):





- HEMERROR: if any translation errors occur, they will be shown as notes as part of the edited member. Correct the errors, save the member and rerun the translation

```
File Edit Edit_Settings Menu Utilities Compilers Test Help
-----
EDIT          YCOS.HEM.PARMLIB(JOBNAME) - 01.00          Columns 00001 00072
Command ==>                                         Scroll ==> CSR
***** ***** Top of Data *****
=====
===== Erros during HEM Translate
=====
=====
===== Correct the Erros and Translate again
=====
=====
===== HEM50005E Unknown SET value for MSG - Z          in statement 1
===== HEM0105I SET FAIL=YES MSG=Z
=====
000001 *****
000002
000003 SET FAIL=YES MSG=Z
000004 INC JOB=HEMT0101
000005
000006 SET MODE=INACT MSG=I
000007 INC JOB=HEMT0102
000008
000009 SET MODE=SIM MSG=I
000010 INC JOB=HEMT0103
000011
000012 SET FAIL=YES MSG=N
000013 INC JOB=HEMT0104
000014
000015 SET MODE=SIM MSG=I
000016 INC JOB=HEMTALLF
000017
***** ***** Bottom of Data *****
```

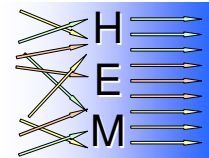
**Figure 11: Exit/Function Options – Translate errors**

- HEMSRCE: the given Set and Filter statements will be translated to an assembler source code HEMFUN##
- HEMSTMP: the Time Stamp assembler source code for function ## will be also be created
- „Compile Function“ and „Link Function“: as part of a successful translation through HEMPARM, the HEMSRCE assembler source code will be compiled and two load modules will be created in the PDSELIB dataset with names:
  - HEMFN##A und HEMFN##B
- „Time Stamp“: as part of a successful translation through HEMPARM and successful compile/link of HEMSRCE, the HEMSTMP assembler source code time stamp will also be compiled in a HEMFX## module within the PDSELIB. The HEMFX## member have the following format:

```
HEMFX## AMODE 31
HEMFX## RMODE ANY
HEMFX## CSECT ,          Timestamp CSECT
FUNC_NAM DC      CL8 'HEMFUN##'          Filter-table CSECT name
```

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```
DATE_CHR DC      CL8 'yyyymmdd'      Date in char
TIME_CHR DC      CL12 'hh:mm:ss.hh'  Time in char
USERID  DC      CL8 'userid'        User performing XLATE
```

Afterwards HEMFX## will be linked within HEMCURRE (replacing the old HEMFX## CSECT)

- All results of the compiles (HEMSRCE and HEMSTMP) and of the links (HEMFN##A, HEMFN##B, HEMF##, HEMCURRE) will be written to a dataset with a name in the following form:

```
userid.HEM.SRCE##.membername.Dmmtt.Thhmss
!
!
!      !  +-- name of the translated member
!      +-- ## = function number 01-23
+-- Userid of the translator
```

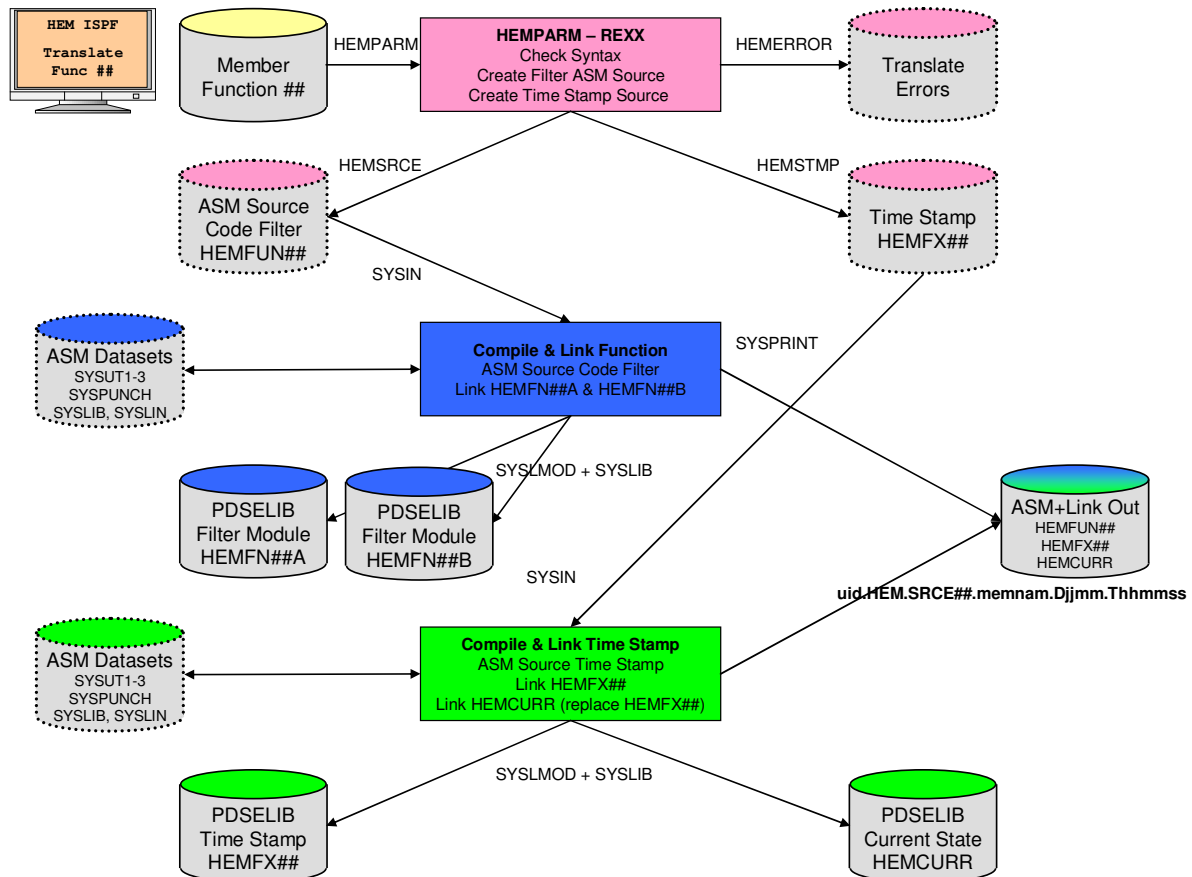
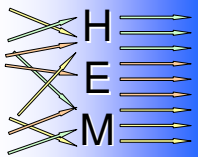


Figure 12: Exit/Function Options – Translate flow

### 2.3.1.6 C – Check

Check of the Set and Filter statements. This function can be used to correlate trace and SMF information with filter statements. This function can also be used to check the validity of the Set and Filter statements. Errors will be shown in the same way as through a translate (see 2.3.1.5 T – Translate on page 12)





```
VIEW          SYS06317.T202955.RA000.YVES.R0100015          Columns 00001 00072
Command ==>>                                          Scroll ==>> CSR
***** Top of Data *****
----- Last Translate: HEMFUN01 2006/10/13 07:35:39.80 YVES
000001 ** Test for 0001 "INC JOB=HEMT0101"
000002 ** Set for 0001 FAIL YES
000003 ** ----
000004 ** Test for 0002 "INC JOB=HEMT0102"
000005 ** Set for 0002 FAIL NO
000006 ** ----
000007 ** Test for 0003 "INC JOB=HEMT0103"
000008 ** Set for 0003 FAIL NO
000009 ** ----
000010 ** Test for 0004 "INC JOB=HEMT0104"
000011 ** Set for 0004 FAIL YES
000012 ** ----
000013 ** Test for 0005 "INC JOB=HEMTALLF"
000014 ** Set for 0005 FAIL NO
000015 ** ----
000016 ** Test for 0006 "INC JOB=HEMT1401"
000017 ** Test for 0007 "INC JOB=HEMT14A1"
000018 ** Test for 0008 "INC JOB=HEMT14B1"
000019 ** Set for 0006 FAIL NO
000020 ** ----
***** Bottom of Data *****
```

**Figure 13: Exit/Function Options – C – Check**

- Test and Set statement are separately numbered. The test number will be shown in tracing messages and in SMF reports

- o Tracing:

```
HEMTR001I FUNCTION:01 INCLUDE FILTER:00000005 MODE=ACT MSG=I SMF=I
```

- o SMF:

```
HEM - 01 Jobname Check
-----
HEM SMF Record 238 Analysis - System: SYS1
19/10/06 14:00:16 SYS1 J HEM01001E*HEMTALLF FAILED USING JOBNAME(HEMTALLF) <YVES >
... column 176 ...
<YVES > J0000123 01 0005
```

**Figure 14: Filter number in Tracing and SMF**

All functions Edit, Parm, View, Translate and Check will also display information about the last Member Changes and Translate statistics

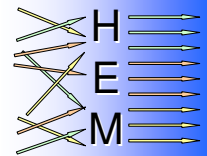
```
VIEW          SYS06317.T202955.RA000.YVES.R0100015          Columns 00001 00072
Command ==>>                                          Scroll ==>> CSR
***** Top of Data *****
----- Member Changes: HEMFUN01 2006/10/12 18:17:28 YVES
----- Last Translate: HEMFUN01 2006/10/13 07:35:39.80 YVES
000001 ...
000002 ...
```

**Figure 15: Translate statistics**



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- Name of the Filter Module, Date, Time and Userid (*HEMBASE no Translate done since Installation*)

### 2.3.2 MODE

The default mode of the function must be given and the following modes are possible:

- Act – Active: the function is active and all SET statements without MODE parameter will also be active
- Inact – Inactive: the function is deactivated and NONE of the Filter/Set statements will be used
- Sim – Simulation: the function is active but in a simulation mode; all SET statements without MODE parameter will also be active and in simulation mode. Simulation means that the normal messages and SMF records will be written but the job will not be changed or cancelled. This fact will be shown in every message and SMF record – an asterisk will be inserted between message id and message:

```
HEM#####x*message
      ^
      !
      +----- * = Simulation
```

```
HEM01001E*HEMTALLF FAILED USING JOBNAME(HEMTALLF) <YVES >
```

### 2.3.3 MSG/Message

The default setting for messages has to be defined – the messages will be written to SYSLOG/Joblog:

- I – Inf – Information: all SET statements without defined MSG setting will produce all type of messages (*Information and Error*)
- E – Err – Error: all SET statements without defined MSG setting will produce only the error type of messages
- N – None – None: all SET statements without defined MSG setting will produce NO messages! Care should be taken using this setting; please review the SMF Setting to be sure to record information about HEM changes!

### 2.3.4 SMF

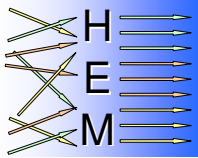
The default setting for SMF recording has to be defined:

- I – Inf – Information: all SET statements without defined SMF setting will produce all type of messages (*Information and Error*)
- E – Err – Error: all SET statements without defined SMF setting will produce only the error type of messages
- N – None – None: all SET statements without defined SMF setting will produce NO messages! Care should be taken using this setting; please review the MSG Setting to be sure to record information about HEM changes!

### 2.3.5 mm/dd hh:tt Translate







Last Date and time of the last translate.

### 2.3.6 Tracing

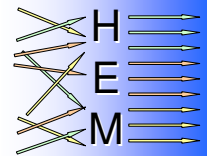
For every function a job name to be traced can be given. The job name cannot be generic – it must be fully qualified. See HEM Tracing on page 114.

### 2.3.7 Global changes

Any change to MODE, MSG, SMF or Tracing will be immediately activated. The module HEMGOPTS (see *HEMGOPTS* on page 3) will be compiled and linked into the PDSE library. HEMGOPTS will then be replaced within the HEMCURRE load module of the PDSELIB. As every 10 seconds the started task looks for changes, it will refresh the in-storage options. HEMGOPTS has the following format:

- see HEMGOPTS on page 3
- the compile and link listings of HEMGOPTS and the link of HEMCURRE will be stored in:

```
userid.HEM.GOPTS.Dmmtt.Thhmmss
```



## 2.4 Display Change Information – I

This function queries the PDSELIB (*HEMGOPTS* and *HMFx##*) to display information about the last global changes (see 2.3.7 *Global changes* on page 17) and the last translate each of the functions (see 2.3.1.5 *T – Translate* on page 12):

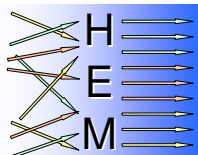
```

Menu  Utilities  Help
-----
HEM - HOST Exit Manager - Change Information
Option ==>
Function      Module      Date      Time      Userid
-- Global Options      2006/08/24  20:25:29.90  YVES
01 Jobname Check      HEMFUN01  2006/08/28  09:03:08.42  YVES
02 Job Account Code Set  HEMFUN02  2006/08/24  20:34:05.34  YVES
03 Job Account Codes Check HEMFUN03  2006/08/24  20:34:56.96  YVES
04 Job Jobclass Set     HEMFUN04  2006/08/24  20:35:16.57  YVES
05 Job Jobclass Check   HEMFUN05  2006/08/24  20:35:36.59  YVES
06 Job Msgclass Set     HEMFUN06  2006/08/24  20:35:56.06  YVES
07 Job Programmer Name Set HEMFUN07  2006/08/24  20:36:15.62  YVES
08 Job System Set       HEMFUN08  2006/08/24  20:36:34.98  YVES
09 Job Duplicate Check   HEMFUN09  2006/08/24  20:36:54.57  YVES
10 Job Input Priority Set HEMFUN10  2006/08/24  20:37:14.70  YVES
11 DD Dsname Set        HEMFUN11  2006/01/01  00:00:00.00  HEMBASE
12 DD Duplicate Check    HEMFUN12  2006/01/01  00:00:00.00  HEMBASE
13 Job System Check      HEMFUN13  2006/01/01  00:00:00.00  HEMBASE
14 Job CPU Time Limit Set HEMFUN14  2006/01/01  00:00:00.00  HEMBASE
15 Step Region Set       HEMFUN15  2006/01/01  00:00:00.00  HEMBASE
16 DD Line Limit Set     HEMFUN16  2006/08/22  22:11:33.10  YVES
17 Step CPU Time Ext. Set HEMFUN17  2006/01/01  00:00:00.00  HEMBASE
18 Step Wait Time Ext. Set HEMFUN18  2006/01/01  00:00:00.00  HEMBASE
19 DD Line Extension Set HEMFUN19  2006/01/01  00:00:00.00  HEMBASE
20 DD Sysout Set         HEMFUN20  2006/08/31  06:29:41.89  YVES
21 DD Output Priority Set HEMFUN21  2006/08/24  19:02:26.68  YVES
22 DD Outdisp Set        HEMFUN22  2006/08/24  19:02:49.56  YVES
23 Step Abend Set        HEMFUN23  2006/01/01  00:00:00.00  HEMBASE

Copyright YCOS Yves Colliard Software GmbH - 2006-08 - V1.9.0
  
```

Figure 16: Change Information – HEMINFO





## 2.5 Display SMF Records – S

HEM produces, depending on the SMF parameter setting, various SMF records. The record type is given through the started task – a default of 238 will be used.

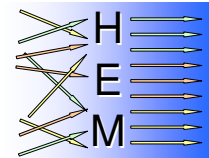
Using a batch job the SMF records can be selected and formatted, so they can be viewed using the HEM ISPF interface. The following batch job can be used to prepare the data for viewing:

```
//*-----  
//* HEM - HVB EXIT MANAGER - SMF FORMATING  
//* COPYRIGHT YCOS YVES COLLIARD SOFTWARE GMBH - 2006-08  
//*-----  
//* CHANGE OUTPUT DATASET NAME IF NEEDED!  
//* ISPSTART CMD(%HEMSMF HEM.SMF.RPT)  
/*  
/*          !  
/*          +---- USERID.HEM.SMF.RPT  
/*          MUST EXIST!!!  
/*          PO (PDSE BEST!)  
/*          LRECL 256 OR MORE  
/*          RECFM VB  
/*-----  
/* SET HEMLOAD=YCOS.HEM.LOADLIB  
/* SET HEMREXX=YCOS.HEM.CLIST  
/* SET ISPFHLQ=SYS1.ISPF  
/*  
/*SMFDP EXEC PGM=IFASMFDP,REGION=0M  
/*IN1 DD DISP=SHR,DSN=SYS1.MANX <- SMF INPUT  
/**IN1 DD DISP=SHR,DSN=SYS1.MANY  
/**IN1 DD DISP=SHR,DSN=SYS1.MANZ  
/*OUT1 DD DSN=&SMFIN,DISP=(,PASS),UNIT=3390,SPACE=(TRK,(50,50),RLSE)  
/*SYSPRINT DD SYSOUT=*  
/*SYSIN DD *  
INDD(IN1,OPTIONS(DUMP))  
OUTDD(OUT1,TYPE(238:238))  
/*  
/*SMFCNV EXEC PGM=VBS2VB  
/*STEPLIB DD DISP=SHR,DSN=&HEMLOAD  
/*SYSPRINT DD SYSOUT=*  
/*VBSIN DD DISP=SHR,DSN=&SMFIN  
/*VBOU DD DSN=&SMFOU,DISP=(,PASS),UNIT=3390,SPACE=(TRK,(50,50),RLSE)  
/*SYSIN DD *  
ALL ,ALL  
/*HEMSMFF EXEC PGM=IKJEFT01,REGION=0M,DYNAMNBR=300  
/*SYSPROC DD DISP=SHR,DSN=&HEMREXX  
/*IN DD DSN=&SMFOU,DISP=SHR  
/*SYSTSPRT DD SYSOUT=*  
/*SYSOUT DD SYSOUT=*  
/*SYSPRINT DD SYSOUT=*  
/*ISPABL DD DSN=&TLIB,SPACE=(TRK,(1,1,5)),LRECL=80,RECFM=FB,DISP=(NEW,PASS)  
/*ISPBLIB DD DSN=&SLIB,SPACE=(TRK,(1,1,5)),LRECL=80,RECFM=FB,DISP=(NEW,PASS)  
/*ISPPLIB DD DSN=&PLIB,SPACE=(TRK,(1,1,5)),LRECL=80,RECFM=FB,DISP=(NEW,PASS)  
/*ISPPROF DD DSN=&PROF,SPACE=(TRK,(1,1,5)),LRECL=80,RECFM=FB,DISP=(NEW,PASS)  
/*ISPLIB DD DSN=&ISPFHLQ..SISPMENU,DISP=SHR  
/*ISPTLIB DD DSN=&ISPFHLQ..SISPTENU,DISP=SHR  
/*SYSTSIN DD *  
ISPSTART CMD(%HEMSMF HEM.SMF.RPT)  
/*
```

Figure 17: SMF Formatting

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### Batch job description:

- general:
  - o the name of the HEM load library must be corrected in the HEMLOAD SET Statement
  - o the name of the HEM clist/rexx library must be corrected in the HEMREXX SET Statement
  - o the prefix of the ISPF libraries must be corrected in the ISPFHLQ SET Statement
- Step SMFDP: dump of the SMF data using the IBM standard utility – IFASMFDP – to select all record type 238
  - o this step can be skipped, if the records are already selected/dumped
  - o IN1 must be customized
- Step SMFCNV: change of the record format; from VBS to VB. REXX is not able to read VBS records; this program changes VBS records to VB
  - o this step can be skipped, if the records are already in VB format
- Step HEMSMFF: formatting of the SMF records using the HEMSMF rexx procedure. The name of the output dataset must be given as a parameter – in this example HEM.SMF.RPT – the dataset must be preallocated using the following characteristics:
  - o Organization . . . : PO (PDSE also supported)
  - o Record format . . . : VB
  - o Record length . . . : 256 (Minimum)
  - o 1st extent tracks . : 15 (Minimum)
  - o Secondary tracks . : 15 (Minimum)
  - o Directory Blocks . : 46 (other values supported)

The following members will be created within this PO dataset, depending on the SMF data:

  - o HEMSMF##
    - 00 – System SMF Records, about start, stop, changes...
    - 01-23 function SMF records
  - o the members will be created with statistics depending on the creation date and time; the Userid will always be HEM

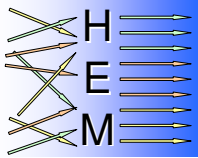
```

Menu  Utilities  Help
-----
HEM - Host Exit Manager - SMF Display          Row 1 to 3 of 3
Option ==> _____ Scroll ==> CSR
SMF Dataset: _____

Edit, View, Browse
S Function      Member      Lines Date      Time      Userid
***** Bottom of data *****
  
```

Figure 18: SMF Records – HEMSMFP





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The name of the formatted SMF PO dataset must be given:

```
Menu  Utilities  Help
-----
HEM - Host Exit Manager - SMF Display      Row 1 to 3 of 3
Option ==> _____ Scroll ==> CSR
SMF Dataset: HEM.SMF.RPT

Edit, View, Browse
S Function                               Member      Lines Date      Time      Userid
-- HEM INTERNAL MESSAGES                 HEMSMF00    1 2006/08/27 00:15    HEM
04 JOB JOBCLASS SET                      HEMSMF04    6 2006/08/27 11:10    HEM
08 JOB SYSTEM SET                        HEMSMF08    1 2006/08/27 10:51    HEM
***** Bottom of data *****
```

**Figure 19: SMF Records – Display**

Only the members with data will be created/shown. The line commands B – Browse (S can also be used as a synonym), E – Edit and V – View can be used to display the data.

```
Menu  Utilities  Compilers  Help
-----
BROWSE  YVES.HEM.SMF.RPT(HEMSMF00) - 01.00      Line 00000000 Col 001 080
Command ==> _____ Scroll ==> CSR
***** Top of Data *****
HEM -- HEM Internal Messages
-----
HEM SMF Record 238 Analysis - System: SYS1

19/10/06 14:00:15 SYS1 - HEM00001I STARTING HEM 1.0.0-PTF00000 WITH SMF RECORD
19/10/06 14:00:15 SYS1 - HEM00004I CSA CONTROL BLOCK AT 06B092B8 REUSED
19/10/06 14:00:15 SYS1 - HEM00012I SUBSYSTEM HEMS ALREADY ACTIVE
20/10/06 08:49:57 SYS1 - HEM00006I YVES      FILTER 21 ADDED IN LPA AT 05E19000
20/10/06 08:51:49 SYS1 - HEM00006I YVES      FILTER 21 ADDED IN LPA AT 05E1E000
***** Bottom of Data *****
```

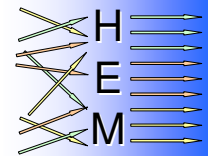
**Figure 20: SMF Records – HEMSMF00**

The SMF formatted PO dataset can also be edited directly using the ISPF editor (Browse, Edit or View).



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The SMF record headers have the following format:

SMFHEMLEN	DS	H	Record Length
SMFHEMSEG	DS	H	0 - Segment Length
SMFHEMFLG	DS	X	0 - Flag set By System /IEFU83
SMFHEMRTY	DS	X	Record Number 00-FF Default 238 x'EE'
SMFHEMTME	DS	CL4	Time since Midnight
SMFHEMDTE	DS	CL4	Date
SMFHEMSID	DS	CL4	System Name
SMFHEMFIL	DS	0CL4	Filter Info
SMFHEMFUN	DS	C	1rst Byte = Function #
*			00 = STC
SMFHEMINC	DS	CL3	3 Bytes = Include Statement #
SMFHEMJNM	DS	CL4	Job Number - if available
SMFHEMJTP	DS	C	Job Type
		b'000. ....'	HEM
		b'100. ....'	Batch
		b'010. ....'	TSO
		b'001. ....'	STC
		c'S'	STC
		c'T'	TSO
		c'J'	Batch
		c'A'	Appc
SMFHEMRES1	DS	CL3	Reserved 3 Bytes
SMFHEMRES2	DS	CL4	Reserved 4 Bytes

**Figure 21: SMF Records**

The formatted SMF records have the following format:

HEM - 01 Jobname Check
-----
HEM SMF Record 238 Analysis - System: SYS1
19/10/06 14:00:16 SYS1 J HEM01001E*HEMTALLF FAILED USING JOBNAME(HEMTALLF) <YVES >
-----5---10---15---20---25---30---35---40---45---50---55---60---65---70---75---80---85
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+

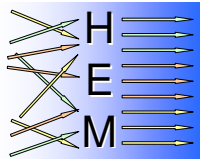
... and more to the right ...

<YVES > J0000123 01 0005
155--160--165--170--175--180
---+---+---+---+---+---+---+---+---+---

**Figure 22: formatted SMF Records**

- HEM - 01 Jobname Check  
Number and name of the function
- HEM SMF Record 238 Analysis - System: SYS1  
SMF record number and reported system
- 19/10/06 14:00:16 SYS1 J HEM01001E\*HEMTALLF FAILED USING JOBNAME(HEMTALLF) <YVES >  
Column 1: date format tt/mm/jj  
Column 10: time format hh:mm:ss





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Column 19: system name

Column 24: address space type: J – batch job, S – started task, T – TSO, A –  
APPC/ASCH, a „-“, will be shown on system messages (*HEMSMF00*)

Column 26: message id

Column 35: information about simulation: \*

Column 36: message

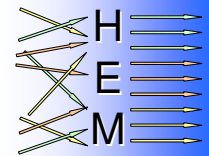
`<YVES > J0000123 01 0005`

Column 153: userid in form <userid >. This information will be searched within the message! On certain records/messages HEM does not (*or is not able*) to inform about the user within the message, in this case the SMF formatting program will show “<\*\*NONE\*\*>” as userid. This can for instance append on function 11 “DD Dsname Set” if both dataset names (*old and new*) are too long!

Column 164: xxxxxxxx – job type (x) and number (xxxxxxx)

Column 176: filter number – see 2.3.1.6 C – Check on page 14





### 2.6 ISPF Help – PF1

An extended Help is also part of the HEM ISPF interface. The Help panels have the following organization:

Panel	PF1	Point&Shoot to Help
HEMHELP	HEMPRIM HEM Primary Menu	HEMHFN01-23 HEMHBASE HEMHMEMB HEMHOPTS HEMHINFO HEMHSMFP
HEMHBASE	HEMBASE Base Definition	HEMHELP HEMHMEMB HEMHOPTS HEMHINFO HEMHSMFP
HEMHMEMB	HEMMEMB Member Defaults	HEMHFN01-23 HEMHELP HEMHBASE HEMHOPTS HEMHINFO HEMHSMFP
HEMHINFO	HEMINFO Change Information	HEMHELP HEMHBASE HEMHMEMB HEMHOPTS HEMHSMFP
HEMHSMFP	HEMSMFP SMF Display	HEMHELP HEMHBASE HEMHMEMB HEMHOPTS HEMHINFO
HEMHFN01-23		HEMHELP HEMHBASE HEMHMEMB HEMHOPTS HEMHINFO HEMHSMFP

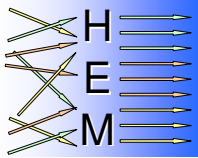
PF1 can be used on every panel.

An Help pull-down menu is available on every Panel. The Function Option panel delivers also pull-down help for every function.

Point-and-Shoot fields can be used within the Help panels to select other Helps.







## 3 HEM Functions

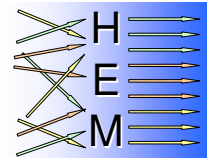
HEM is used to enforce standards within mainframe environments. The functions are defined within the HEM ISPF application.

The definitions are saved in PDS(E) members (*LRECL=80*) and the following syntax rules have to be respected:

- lines starting with an asterisk “\*” are comments
- blank lines are also treated as comments
- within a definition/record the “/\*” and “\*/” can be used to create comments
- only columns 1 to 71 can be used for definition
- a non-blank character in column 72 can be used for continuation
- parameters must be separated by blank (*one or many*) or comma “,”
- the following comparators can be used (*not all filters support less than and greater than*)
  - = equal
  - < less than
  - > greater than
  - ^= not equal
- the comparison can include multiple strings, in which case the strings must be separated (*by blank or comma*) and enclosed in parentheses
  - JOBCLASS=(A,B,C)
  - or
  - JOBCLASS=(A B C)
- comparison with special characters or blanks (*accounting, programmer name...*) must be single quoted
  - PGMRNAME='YVES COLLIARD'

The definitions can be splitted into three categories:

- SET general options: actions to be done, based on a match of the filter. These options are always given, per default (*see 2.3 Exit/Function Options – O on page 10*) or can be given on every SET Statement:
  - MODE, MSG and SMF – see 2.3.2 MODE, 2.3.3 MSG/Message and 2.3.4 SMF starting on page 16
- SET function specific settings: actions and/or changes to be done, based on a match of the filter. These function specific settings are optional and could be like:
  - FAIL – abort processing
  - CPUTIME – function 14 – extend CPU Time Limit
- multiple INC/EXC – INCLude/EXCLude – filter statements can be given to define which type of address space (*depending on jobname, accounting, job class...*) are to be selected. If not given INCLude will be the default. Many filter parameters are common to all functions; the others are dependent on the function and the used exit. Most of the filter statements support generic/wildcard definitions:



Character(s)	Significance	Remark/Example
/	any generic mask <i>(any length – must be last character)</i>	JOBNAME=DB2/ – any job with an 3 to 8 character jobname; starting with DB2
?	one character – but not a period “.”	useful in filter where a period has to be specifically recognized ( <i>DSN</i> )
%	one decimal character	JOBNAME=DB2%MSTR – any job with a 8 character jobname; fourth character can be any one numeric digit
*	only DSN filter – one qualifier	DSN=YVES.*.CNTL – any dataset with 3 qualifiers and the second one can be anything
**	only DSN filter – many qualifiers ( <i>but not first qualifier</i> )	DSN=YVES.**.CNTL – any dataset with at least 3 qualifiers and the dataset name high level qualifier is YVES and the low level qualifier is CNTL

**Figure 23: Filter generic/wildcard**

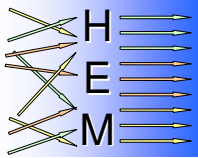
- INCLude behaviour: the first INCLude match will activate the SET statement – no other INCLude/EXCLude within this SET statement AND no other SET statements will be analyzed
- EXCLude behaviour: the first EXCLude match will leave the SET statement – no other INCLude/EXCLude within this SET statement will be analyzed AND the next SET statement will be analyzed
- Examples of INCLude and EXCLude:

```

SET JOB_ACCT(1) = YVES MODE=ACT MSG=I SMF=I
INC JOB=HEMT0206
  JOB=HEMT0407
EXC JOB=HEMT1/
INC JOB=HEMT2001

SET JOB_ACCT(1) = COLLIARD MODE=ACT MSG=I SMF=I
EXC JOB=HEMT2/
INC JOB=HEMT1001
    
```

- Job HEMT0206 accounting parameter 1 will be set to YVES
- Job HEMT0407 accounting parameter 1 will be set to YVES
- Job HEMT1001 will be EXCLuded from first SET Statement and match the INCLude of the second SET statement; accounting parameter 1 will be set to COLLIARD
- Job HEMT2001 accounting parameter 1 will be set to YVES
- Jobs HEMT1xxx (*except HEMT1001*) will not be changed
- Jobs HEMT2xxx (*except HEMT2001*) will not be changed



## 3.1 Jobname Check – 01

The Jobname Check function is used to control the correct usage of jobnames in batch jobs and started tasks.

### 3.1.1 Filter Parameter

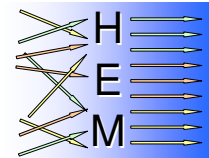
General filter keywords:

- PGMRNAME: Job programmer's name – usable within all filters – max 20 characters – generic – single quoted for special characters – multiple filters must be enclosed in parentheses and separated with blank or coma
- JOBCLASS: Job execution class – usable within all filters – max 1 character – 0-9 or A-Z – multiple filters must be enclosed in parentheses and separated with blank or coma
- MSGCLASS: Job message class – usable within all filters – max 1 character – 0-9 or A-Z – multiple filters must be enclosed in parentheses and separated with blank or coma
- JOB: Job name – usable within all filters – max 8 characters – generic – or &USER – multiple filters must be enclosed in parentheses and separated with blank or coma
  - the usage of &USER will ALWAYS be treated as a generic check
  - user YCOS and job name YCOSA will match!
- USER: RACF userid – usable within all filters – max 8 characters – generic – multiple filters must be enclosed in parentheses and separated with blank or coma
- GROUP: RACF group – usable within all filters – max 8 characters – generic – multiple filters must be enclosed in parentheses and separated with blank or coma
- ANY\_GROUP: RACF group connects – usable within all filters – max 8 characters – generic – multiple filters must be enclosed in parentheses and separated with blank or coma
- DAY: Weekday – usable within all filters – max 1 character – 1-7 – Monday to Sunday – multiple filters must be enclosed in parentheses and separated with blank or coma
- TIME: Time – usable within all filters – exactly 9 characters – hhmm-hhmm – between hhmm and hhmm – multiple filters must be enclosed in parentheses and separated with blank or coma
- SYSID: System identifier – usable within all filters – max 4 characters – generic – multiple filters must be enclosed in parentheses and separated with blank or coma
  - functions 01-11, 16 and 20-22 check the conversion system id
  - all other functions check the execution system id
- XMODE: Address space type – usable within all filters – exactly 3 characters – multiple filters must be enclosed in parentheses and separated with blank or coma
  - functions from JES2 exits can be checked against: JOB TSU STC SYS

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- all other functions can be checked against: JOB TSU STC APC SYS
- SYS meaning: not a “valid” address space type (*JES2 = JOB+ TSU+ STC, others = JOB+ TSU+ STC+ APC*)

Function filter keywords:

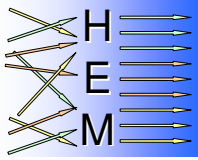
- Job accounting:
  - JOB\_ACCT(1): max 20 characters – generic – single quoted for special characters
  - JOB\_ACCT(2): max 20 characters – generic – single quoted for special characters
  - JOB\_ACCT(3): max 20 characters – generic – single quoted for special characters
  - JOB\_ACCT(4): max 20 characters – generic – single quoted for special characters
  - JOB\_ACCT(5): max 20 characters – generic – single quoted for special characters

### 3.1.2 Set Parameter

General set keywords:

- MODE: the mode of the function can be given; the default is defined in the Options (see 2.3.2 MODE on page 16). The following modes are possible:
  - MODE=ACT – Active: the function is active
  - MODE=INACT – Inactive: the function is deactivated and NONE of the filter statements will be used
  - MODE=SIM – Simulation: the function is active but in a simulation mode. Simulation means that the normal messages and SMF records will be written but the job will not be changed or cancelled. This fact will be shown in every message and SMF record – an asterisk will be inserted between message id and message.
- MSG: the message setting can be given; the default will be defined within the Options (see 2.3.3 MSG/Message on page 16):
  - MSG=I – Information: all types of messages will be produced (*Information and Error*)
  - MSG=E – Error: only the error type of messages will be produced
  - MSG=N – None: NO messages will be produced! **ATTENTION:** Care should be taken using this setting; please review the SMF Setting to be sure to record information about HEM changes!
- SMF: the SMF setting can be given; the default will be defined within the Options (see 2.3.4 SMF on page 16):
  - SMF=I – Information: all types of messages will be produced (*Information and Error*)
  - SMF=E – Error: only the error type of messages will be produced
  - SMF=N – None: NO messages will be produced! **ATTENTION:** Care should be taken using this setting; please review the MSG Setting to be sure to record information about HEM changes!





Function set keywords:

- FAIL: must be set to FAIL=YES (*Default NO*) to prevent unwanted job name usage.

### 3.1.3 Coding examples

```
* FAIL ALL JOBS USING JOBNAME=USER (GENERIC) ON SYSTEM MVS6
SET MODE=ACT FAIL=YES
INC JOB=&USER   SYSID=MVS6
```

### 3.1.4 Messages

```
HEM01001E jobnamex FAILED USING JOBNAME(xxxxxxxx) <userid >
```

Job of userid filter matching – Job failed using this jobname (*if not simulation*)

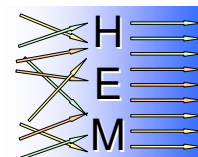
```
HEM00310E SMF WRITE RECORD ERROR RC=xxxxxxxx
```

Internal error: problem during writing SMF. See Typical SMF error codes on page 83.

**ATTENTION:** The messages of function 1 will be sent to syslog/joblog within the JES2 exit 6! Jobs waiting on conversion will not show the HEM messages of functions 1 to 10!

### 3.1.5 Exits used

JES2 Exits: EXIT20, EXIT50, EXIT06



## 3.2 Job Account Code Set – 02

The Job Account Code Set function is used to set the right account parameter within jobs.

### 3.2.1 Filter Parameter

General filter keywords:

- PGMRNAME, JOBCLASS, MSGCLASS, JOB, USER, GROUP, ANY\_GROUP, DAY, TIME, SYSID and XMODE (see general filter keywords on page 28)

Function filter keywords:

- JOB\_ACCT(1), JOB\_ACCT(2), JOB\_ACCT(3), JOB\_ACCT(4), JOB\_ACCT(5) (see function filter keywords on page 28)
- FORMS: Form – max 4 characters – generic – multiple filters must be enclosed in parentheses and separated with blank or coma

### 3.2.2 Set Parameter

General set keywords:

- MODE, MSG and SMF (see general set keywords on page 29)

Function set keywords:

- JOB\_ACCT(1), JOB\_ACCT(2), JOB\_ACCT(3), JOB\_ACCT(4), JOB\_ACCT(5) can be used to set or replace actual accounting definitions
- REPLACE=NO must be specified (Default YES) to prevent HEM from overtyping actual accounting parameters

### 3.2.3 Coding examples

```
* SET ACCOUNTING FIELD 1 AND 2 OF JOB HEMT0206
SET JOB_ACCT(1) = YVES JOB_ACCT(2) = COLLIARD  MODE=ACT MSG=I SMF=I
INC JOB=HEMT0206
```

### 3.2.4 Messages

```
HEM02001I jobnamex <userid > NEW ACCT( )
```

Job of userid filter matching – Job accounting information changed (if not simulation)

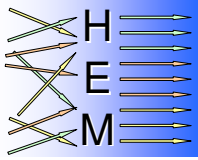
```
HEM00310E SMF WRITE RECORD ERROR RC=xxxxxxxx
```

Internal error: problem during writing SMF. See Typical SMF error codes on page 83.

**ATTENTION:** The messages of function 2 will be sent to syslog/joblog within the JES2 exit 6! Jobs waiting on conversion will not show the HEM messages of functions 1 to 10!

### 3.2.5 Exits used



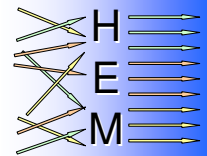


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JES2 Exits: EXIT20, EXIT50, EXIT06





### 3.3 Job Account Code Check – 03

The Job Account Code Check function is used to verify the correct usage of account parameters within jobs.

#### 3.3.1 Filter Parameter

General filter keywords:

- PGMRNAME, JOBCLASS, MSGCLASS, JOB, USER, GROUP, ANY\_GROUP, DAY, TIME, SYSID and XMODE (see general filter keywords on page 28)

Function filter keywords:

- JOB\_ACCT(1), JOB\_ACCT(2), JOB\_ACCT(3), JOB\_ACCT(4), JOB\_ACCT(5) (see function filter keywords on page 28)
- FORMS (see FORMS on page 31)

#### 3.3.2 Set Parameter

General set keywords:

- MODE, MSG and SMF (see general set keywords on page 29)

Function set keywords:

- FAIL: must be set to FAIL=YES (Default NO) to prevent unwanted job accounting usage.

#### 3.3.3 Coding examples

```
* FAIL JOB HEMT0303 IF USING 'ERROR' IN THIRD ACCOUNT PARAMETER
SET FAIL=YES MODE=ACT MSG=I
INC JOB=HEMT0303 JOB_ACCT(3) =ERROR
```

#### 3.3.4 Messages

```
HEM03001E jobnamex <userid > FAILED ACCT( )
```

Job of userid filter matching – Job failed using accounting information (if not simulation)

```
HEM00310E SMF WRITE RECORD ERROR RC=xxxxxxxx
```

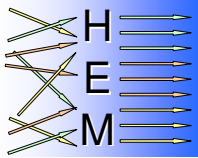
Internal error: problem during writing SMF. See Typical SMF error codes on page 83.

**ATTENTION:** The messages of function 3 will be sent to syslog/joblog within the JES2 exit 6! Jobs waiting on conversion will not show the HEM messages of functions 1 to 10!

#### 3.3.5 Exits used

JES2 Exits: EXIT20, EXIT50, EXIT06





## 3.4 Job Jobclass Set – 04

The Job Jobclass Set function is used to set the jobclass within jobs.

### 3.4.1 Filter Parameter

General filter keywords:

- PGMRNAME, JOBCLASS, MSGCLASS, JOB, USER, GROUP, ANY\_GROUP, DAY, TIME, SYSID and XMODE (see *general filter keywords on page 28*)

Function filter keywords:

- JOB\_ACCT(1), JOB\_ACCT(2), JOB\_ACCT(3), JOB\_ACCT(4), JOB\_ACCT(5) (see *function filter keywords on page 28*)
- FORMS (see *FORMS on page 31*)

### 3.4.2 Set Parameter

General set keywords:

- MODE, MSG and SMF (see *general set keywords on page 29*)

Function set keywords:

- JOBCLASS can be used to set/replace the actual jobclass

### 3.4.3 Coding examples

```
* ALL JOBS BEGINNING WITH HEM CONNECTED TO GROUP SYSP
*      WILL BE SET TO JOB CLASS 4
SET JOBCLASS=4 MODE=ACT MSG=I
INC ANY_GROUP=SYSP      JOB=HEM/
```

### 3.4.4 Messages

```
HEM04001I jobnamex CHANGED FROM JOBCLASS(x) TO JOBCLASS(y) <userid >
```

Job of userid filter matching – Job will be set to job class 4 (if not simulation)

```
HEM00310E SMF WRITE RECORD ERROR RC=xxxxxxxx
```

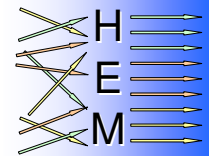
Internal error: problem during writing SMF. See Typical SMF error codes on page 83.

**ATTENTION:** The messages of function 4 will be sent to syslog/joblog within the JES2 exit 6! Jobs waiting on conversion will not show the HEM messages of functions 1 to 10!

### 3.4.5 Exits used

JES2 Exits: EXIT20, EXIT50, EXIT06





### 3.5 Job Jobclass Check – 05

The Job Jobclass Check function is used to verify the usage of jobclass within jobs.

#### 3.5.1 Filter Parameter

General filter keywords:

- PGMRNAME, JOBCLASS, MSGCLASS, JOB, USER, GROUP, ANY\_GROUP, DAY, TIME, SYSID and XMODE (see general filter keywords on page 28)

Function filter keywords:

- JOB\_ACCT(1), JOB\_ACCT(2), JOB\_ACCT(3), JOB\_ACCT(4), JOB\_ACCT(5) (see function filter keywords on page 28)
- FORMS (see FORMS on page 31)

#### 3.5.2 Set Parameter

General set keywords:

- MODE, MSG and SMF (see general set keywords on page 29)

Function set keywords:

- FAIL: must be set to FAIL=YES (Default NO) to prevent unwanted jobclass usage.

#### 3.5.3 Coding examples

```
* JOB HEMT0501 WILL FAIL USING JOBCLASS 4
SET FAIL=YES MODE=ACT MSG=I
INC JOB=HEMT0501      JOBCLASS=4
```

#### 3.5.4 Messages

```
HEM05001E jobnamex FAILED USING JOBCLASS(x) <userid >
```

Job of userid filter matching – Job will failed (if not simulation)

```
HEM00310E SMF WRITE RECORD ERROR RC=xxxxxxxx
```

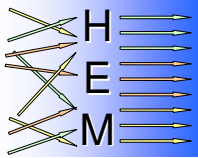
Internal error: problem during writing SMF. See Typical SMF error codes on page 83.

**ATTENTION:** The messages of function 5 will be sent to syslog/joblog within the JES2 exit 6! Jobs waiting on conversion will not show the HEM messages of functions 1 to 10!

#### 3.5.5 Exits used

JES2 Exits: EXIT20, EXIT50, EXIT06





## 3.6 Job Msgclass Set – 06

The Job Msgclass Set function is used to set/replace the msgclass within jobs.

### 3.6.1 Filter Parameter

General filter keywords:

- PGMNAME, JOBCLASS, MSGCLASS, JOB, USER, GROUP, ANY\_GROUP, DAY, TIME, SYSID and XMODE (see general filter keywords on page 28)

Function filter keywords:

- JOB\_ACCT(1), JOB\_ACCT(2), JOB\_ACCT(3), JOB\_ACCT(4), JOB\_ACCT(5) (see function filter keywords on page 28)
- FORMS (see FORMS on page 31)

### 3.6.2 Set Parameter

General set keywords:

- MODE, MSG and SMF (see general set keywords on page 29)

Function set keywords:

- MSGCLASS can be used to set/replace the actual Msgclass

### 3.6.3 Coding examples

```
* MSGCLASS OF JOB HEMT0601 WILL BE SET TO E
SET MODE=ACT MSG=I MSGCLASS=E
INC JOB=HEMT0601
```

### 3.6.4 Messages

```
HEM06001I jobnamex CHANGED FROM MSGCLASS(x) TO MSGCLASS(y) <userid >
```

Job of userid filter matching – Job message class (*MSGCLASS*) will be set (if not simulation)

```
HEM00310E SMF WRITE RECORD ERROR RC=xxxxxxxx
```

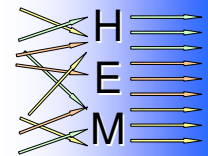
Internal error: problem during writing SMF. See Typical SMF error codes on page 83.

**ATTENTION:** The messages of function 6 will be sent to syslog/joblog within the JES2 exit 6! Jobs waiting on conversion will not show the HEM messages of functions 1 to 10!

### 3.6.5 Exits used

JES2 Exits: EXIT20, EXIT50, EXIT06





### 3.7 Job Programmer Name Set – 07

The Job Programmer Name Set function is used to set the programmer name within jobs. This function can also be used to set the programmer name to 'SYSAFF=sysname' or 'SYSID=ANY|sid', as a front-end of function 08 Job System Set (see 3.8 Job System Set – 08 on page 43).

#### 3.7.1 Filter Parameter

General filter keywords:

- PGMRNAME, JOBCLASS, MSGCLASS, JOB, USER, GROUP, ANY\_GROUP, DAY, TIME, SYSID and XMODE (see general filter keywords on page 28)

Function filter keywords:

- JOB\_ACCT(1), JOB\_ACCT(2), JOB\_ACCT(3), JOB\_ACCT(4), JOB\_ACCT(5) (see function filter keywords on page 28)
- FORMS (see FORMS on page 31)

#### 3.7.2 Set Parameter

General set keywords:

- MODE, MSG and SMF (see general set keywords on page 29)

Function set keywords:

- PGMRNAME can be used to set/replace the actual Programmer Name

#### 3.7.3 Coding examples

```
* SET PROGRAMMER NAME OF JOB HEMT0701
SET PGMRNAME='YCOS YVES COLLIARD'
INC JOB=HEMT0701
```

```
* SET PROGRAMMER NAME OF JOB HEMT0704
* IT WILL RECOGNIZED BY FUNCTION 8
SET PGMRNAME='SYSAFF=AFFINJOB'
INC JOB=HEMT0704
```

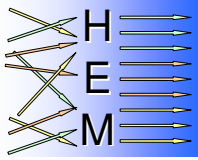
#### 3.7.4 Messages

```
HEM07001I jobnamex CHANGED FROM PGMRNAME(          )
TO (          ) <userid >
```

Job of userid filter matching – Job programmer name will be set (if not simulation)

```
HEM00310E SMF WRITE RECORD ERROR RC=xxxxxxxx
```

Internal error: problem during writing SMF. See Typical SMF error codes on page 83.



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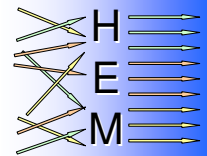
---

**ATTENTION:** The messages of function 7 will be sent to syslog/joblog within the JES2 exit 6! Jobs waiting on conversion will not show the HEM messages of functions 1 to 10!

## 3.7.5 Exits used

JES2 Exits: EXIT20, EXIT50, EXIT06





### 3.8 Job System Set – 08

The Job System Set function is used to set and verify the usage and setting of system affinity within jobs. The affinity can be set to Systems (*like the /\*SYSAFF Parameter*) or be coupled to running address spaces (*this job should run where DB2A is also running!*).

**ATTENTION:** This function can also be requested without using HEM filters and set statements!

This function can be selected within a job using the programmer name field of the job statement. The following parameters are supported:

- 'SYSAFF=jobname'
- 'SYSID=ANY'
- 'SYSID=sid'
- 'SYSID=(sid1,sid2)' (*maximum 20 characters!*)

Examples:

```
//HEMT0815 JOB (001,ACCT), 'SYSAFF=DB2AMSTR'  
/* JOB SYSTEM SET - JCL SYSAFF -  
//...
```

```
//HEMT0816 JOB (001,ACCT), 'SYSID=ANY'  
/* JOB SYSTEM SET - JCL SYSID -  
//...
```

```
//HEMT0817 JOB (001,ACCT), 'SYSID=MVS9'  
/* JOB SYSTEM SET - JCL SYSID -  
//...
```

```
//HEMT0818 JOB (001,ACCT), 'SYSID=(MVS8,MVS9) '  
/* JOB SYSTEM SET - JCL SYSID -  
/* A MAXIMUM OF 2 SYSTEM NAMES ARE POSSIBLE  
/* BECAUSE PROGRAMMERS NAME IS RESTRICTED TO 20 CHARS  
//...
```

#### 3.8.1 Filter Parameter

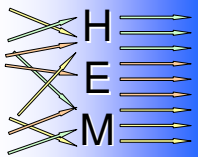
General filter keywords:

- PGMRNAME, JOBCLASS, MSGCLASS, JOB, USER, GROUP, ANY\_GROUP, DAY, TIME, SYSID and XMODE (*see general filter keywords on page 28*)

Function filter keywords:

- JOB\_ACCT(1), JOB\_ACCT(2), JOB\_ACCT(3), JOB\_ACCT(4), JOB\_ACCT(5) (*see function filter keywords on page 28*)
- FORMS (*see FORMS on page 31*)





**ATTENTION:** This function can also be requested without using HEM filters and set statements!

## 3.8.2 Set Parameter

General set keywords:

- MODE, MSG and SMF (see general set keywords on page 29)

Function set keywords:

- SYSID can be used to set the affinity of a job to up to 7 system names. If more than one system is given, then the parameters must be enclosed in parentheses and separated with blank or comma. SYSID=ANY can also be used to specify any JES2 System within the MAS.
- SYSAFF can be used to set the affinity of a job to the system (*systems*) where the given address space is currently running. For instance SYSAFF=DB2AMSTR will check where within the JES2 MAS address space DB2AMSTR is running and will automatically set the affinity to this (*those, if many*) system (*s*).
- FAIL: must be set to FAIL=YES (*Default NO*) to prevent jobs from running if the specific jobname is not already running.

**ATTENTION:** This function can also be requested without using HEM filters and set statements!

## 3.8.3 Coding examples

```
* SET AFFINITY TO MEMBER MVS3 FOR JOB HEMT0809
*   IF MEMBER MVS3 NOT ACTIVE THEN FAIL THE JOB
SET  SYSID=MVS3 MODE=ACT MSG=I FAIL=YES
INC  JOB=HEMT0809
```

```
* SET AFFINITY FOR JOB HEMT0815 TO THE SYSTEM(S)
*   WHERE JOB AFFINJOB IS RUNNING
SET  SYSAFF=AFFINJOB MODE=ACT MSG=I FAIL=YES
INC  JOB=HEMT0815
```

```
//HEMT0802 JOB (ACCT1), 'SYSID=MVS1'
//* JOB SYSTEM SET - SET AFFINITY WITHOUT USING HEM FILTERS
//*   PROGRAMMER NAME 'SYSID=MVS1' WILL BE RECOGNIZED
//*   UP TO 2 MEMBERS CAN BE SEPCIFIED
//*   'SYSID=(MVS1,MVS2)'
```

```
//HEMT0803 JOB (ACCT1), 'SYSAFF=AFFINJOB'
//* JOB SYSTEM SET - SET AFFINITY WITHOUT USING HEM FILTERS
//*   PROGRAMMER NAME 'SYSAFF=AFFINJOB' WILL BE RECOGNIZED
//*   AFFINITY WILL BE SET TO THE SYSTEM(S) WHERE
//*   AFFINJOB IS CURRENTLY RUNNING
```

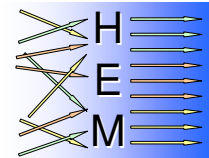
## 3.8.4 Messages

```
HEM08001E jobnamex FAILED NO ACTIVE SYSID( ) <userid >
```



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Job of userid filter matching – Job will be failed, because the SYSID= parameter (*HEM or JCL*) cannot be honored – Member not active (*if not simulation*)  
This message can display up to 7 member names.

```
HEM08002I jobnamex SYSTEM AFFINITY SYSID( ) <userid >
```

Job of userid filter matching – Job system affinity has been set according the SYSID= parameter (*HEM or JCL*) (*if not simulation*)  
This message can display up to 7 member names.

```
HEM08003E jobnamex FAILED NO ACTIVE JOBNAME(req_jobx) IN MAS <userid >
```

Job of userid filter matching – Job will be failed, because the SYSAFF= parameter (*HEM or JCL*) cannot be honored – Requested job (*req\_jobx*) not active (*if not simulation*)

```
HEM08004E jobnamex FAILED NO ACTIVE MEMBER(xxxx) FOR JOBNAME(req_jobx) <userid >
```

Job of userid filter matching – Job will be failed, because the SYSAFF= parameter (*HEM or JCL*) cannot be honored – Requested member for requested job (*req\_jobx*) not active (*if not simulation*)

```
HEM08005I jobnamex SYSAFF J(req_jobx) SYSID( ) <userid >
```

Job of userid filter matching – Job system affinity has been set according the SYSAFF= parameter (*HEM or JCL*). Requested job (*req\_jobx*) is currently running on specified member (*SYSID*) (*if not simulation*)  
This message can display up to 9 member names. If more than 9 member affinities have to be set, then the last one (9) will be displayed as “...”.

```
HEM00310E SMF WRITE RECORD ERROR RC=xxxxxxxx
```

Internal error: problem during writing SMF. See Typical SMF error codes on page 83.

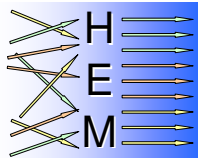
**ATTENTION:** The messages of function 8 will be sent to syslog/joblog within the JES2 exit 6! Jobs waiting on conversion will not show the HEM messages of functions 1 to 10!

### 3.8.5 Exits used

JES2 Exits: EXIT20, EXIT50, EXIT06







## 3.9 Job Duplicate Check – 09

The Job Duplicate Check function is used to ensure the uniqueness of an executing job within the JES2 MAS.

This function is only usable for started tasks and batch jobs!

HEM will check that no other job with the same name is waiting in the input queue or executing.

### 3.9.1 Filter Parameter

General filter keywords:

- PGMRNAME, JOBCLASS, MSGCLASS, JOB, USER, GROUP, ANY\_GROUP, DAY, TIME, SYSID and XMODE (see general filter keywords on page 28)

Function filter keywords:

- JOB\_ACCT(1), JOB\_ACCT(2), JOB\_ACCT(3), JOB\_ACCT(4), JOB\_ACCT(5) (see function filter keywords on page 28)
- FORMS (see FORMS on page 31)

### 3.9.2 Set Parameter

General set keywords:

- MODE, MSG and SMF (see general set keywords on page 29)

Function set keywords:

- FAIL: must be set to FAIL=YES (Default NO) to prevent duplicate jobnames and/or started tasks.

### 3.9.3 Coding examples

```
* FAIL THE JOB HEMT0902 IF ALREADY ACTIVE
*   COULD BE IN THE JES2 INPUT QUEUE
*   OR
*   COULD BE ALREADY ACTIVE IN MAS
SET FAIL=YES MODE=ACT MSG=I
INC JOB=HEMT0902
```

### 3.9.4 Messages

```
HEM09001I jobnamex FAILED ALREADY ACTIVE ON MEMBER(yyyy) <userid >
```

Job of userid filter matching – Job will be failed, because already active in MAS (if not simulation)

```
HEM09002I jobnamex FAILED ALREADY ON INPUT QUEUE IN MAS <userid >
```

Job of userid filter matching – Job will be failed, because already in JES2 MAS input queue (if not simulation)

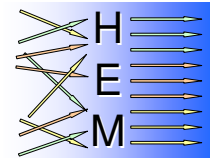
```
HEM00310E SMF WRITE RECORD ERROR RC=xxxxxxxx
```



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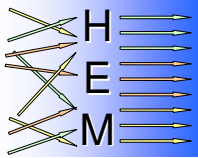
Internal error: problem during writing SMF. See Typical SMF error codes on page 83.

**ATTENTION:** The messages of function 9 will be sent to syslog/joblog within the JES2 exit 6! Jobs waiting on conversion will not show the HEM messages of functions 1 to 10!

### 3.9.5 Exits used

JES2 Exits: EXIT20, EXIT50, EXIT06





## 3.10 Job Input Priority Set – 10

The Job Input Priority Set function is used to set the input priority of a job (*JES2 Input Queue*).

### 3.10.1 Filter Parameter

General filter keywords:

- PGMRNAME, JOBCLASS, MSGCLASS, JOB, USER, GROUP, ANY\_GROUP, DAY, TIME, SYSID and XMODE (see *general filter keywords on page 28*)

Function filter keywords:

- JOB\_ACCT(1), JOB\_ACCT(2), JOB\_ACCT(3), JOB\_ACCT(4), JOB\_ACCT(5) (see *function filter keywords on page 28*)
- FORMS (see *FORMS on page 31*)

### 3.10.2 Set Parameter

General set keywords:

- MODE, MSG and SMF (see *general set keywords on page 29*)

Function set keywords:

- IN\_PRIORITY can be used to set/replace the actual job priority. The value must be numeric, between 0 and 15.

### 3.10.3 Coding examples

```
* JOB INPUT PRIORITY - JES2 - OF JOB HEMT1001 SET TO 14
SET IN_PRIORITY=14 MSG=I MODE=ACT
INC JOB=HEMT1001
```

### 3.10.4 Messages

```
HEM10001I jobnamex CHANGED FROM PRIORITY(xx) TO PRIORITY(yy) <userid >
```

Job of userid filter matching – Job input priority changed (*if not simulation*)

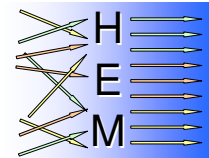
```
HEM00310E SMF WRITE RECORD ERROR RC=xxxxxxxx
```

Internal error: problem during writing SMF. See Typical SMF error codes on page 83.

**ATTENTION:** The messages of function 10 will be sent to syslog/joblog within the JES2 exit 6! Jobs waiting on conversion will not show the HEM messages of functions 1 to 10!

### 3.10.5 Exits used

JES2 Exits: EXIT20, EXIT50, EXIT06



### 3.11 DD Dsname Set – 11

The DD Dsname Set function is used to change dataset names within jobs and executing address spaces.

#### 3.11.1 Filter Parameter

General filter keywords:

- PGMRNAME, JOBCLASS, MSGCLASS, JOB, USER, GROUP, ANY\_GROUP, DAY, TIME, SYSID and XMODE (see general filter keywords on page 28)

Function filter keywords:

- Step Name:
  - STEP: max 8 characters – generic – multiple filters must be enclosed in parentheses and separated with blank or coma
- Program Name:
  - PGM: max 8 characters – generic – multiple filters must be enclosed in parentheses and separated with blank or coma
- Dataset Name:
  - DSN: max 44 characters – generic – multiple filters must be enclosed in parentheses and separated with blank or coma
- Dynamic allocation:
  - DYNALLOC=ONLY restrict the filter to dynamic allocations. DYNALLOC=NOT restrict the filter to static allocations. Without DYNALLOC parameter all types of allocation will be selected (Default)

#### 3.11.2 Set Parameter

General set keywords:

- MODE, MSG and SMF (see general set keywords on page 29)

Function set keywords:

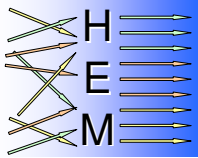
- DSN can be used to set/replace the selected dataset name. The value must be valid dataset name.

#### 3.11.3 Coding examples

```
* CHANGE ALL REFERENCES TO DSNAME TEST.DSN
*   TO DATASET NAME YVES.HEM.LOADLIB
SET DSN= YVES.HEM.LOADLIB  MODE=ACT MSG=I SMF=I
INC DSN= TEST.DSN

* CHANGE ALL REFERENCES TO DSNAME TEST.STAT
*   TO DATASET NAME YCOS.STAT
*   ONLY STATIC (JCL) REFERENCES WILL BE CHANGES
SET DSN= YCOS.STAT  MODE=ACT MSG=I SMF=I DYNALLOC=NOT
INC DSN= TEST.STAT

* CHANGE ALL REFERENCES TO DSNAME TEST.DYN
*   TO DATASET NAME WE.GOT.IT
```



```
* ONLY DYNAMIC ALLOCATION REFERENCES WILL BE  
* SHOWN - SIMULATION MODE  
SET DSN= WE.GOT.IT  MODE=SIM MSG=I SMF=I DYNALLOC=ONLY  
INC DSN= TEST.DYN
```

### 3.11.4 Messages

```
HEM11001I jobnamex stepname dd_namex dataset_old.....  
>dataset_new..... <userid >
```

Job, step and DD name of userid filter matching – Dataset name changed to new dataset name – Static (*if not simulation*)

```
HEM11002I jobnamex stepname dd_namex dataset_old.....  
>dataset_new..... <userid >
```

Job, step and DD name of userid filter matching – Dataset name changed to new dataset name – Dynamic (*if not simulation*)

```
HEM00310E SMF WRITE RECORD ERROR RC=xxxxxxxx
```

Internal error: problem during writing SMF – Static. See Typical SMF error codes on page 83.

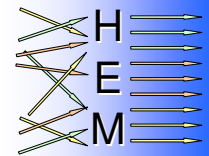
```
HEM00324E SMF WRITE RECORD ERROR RC=xxxxxxxx
```

Internal error: problem during writing SMF – Dynamic. See Typical SMF error codes on page 83.

### 3.11.5 Exits used

JES2 Exit: EXIT06 – static

MVS Exit: IEFDB401 – dynamic



### 3.12 DD Duplicate Check – 12

The DD Duplicate Check function is used to verify that no jobstep specifies the same DD name twice. MVS does not check for this situation and always uses the first DD statement; the second and subsequent will be simply ignored.

#### 3.12.1 Filter Parameter

General filter keywords:

- PGMNAME, JOBCLASS, MSGCLASS, JOB, USER, GROUP, ANY\_GROUP, DAY, TIME, SYSID and XMODE (see general filter keywords on page 28)

Function filter keywords:

- STEP (see function filter on page 51)
- PGM (see function filter on page 51)
- DD Name:
  - DD: max 8 characters – generic – multiple filters must be enclosed in parentheses and separated with blank or coma

#### 3.12.2 Set Parameter

General set keywords:

- MODE, MSG and SMF (see general set keywords on page 29)

Function set keywords:

- FAIL: must be set to FAIL=YES (Default NO) to prevent jobs from using duplicate DD names in their JCL.

#### 3.12.3 Coding examples

```
* ALL JOBS SHOULD BE SIMULATED CHECKED ON PGM IEFBR14
SET MODE=SIM MSG=I SMF=I
INC JOB=/ PGM=IEFBR14

* DD STATEMENT REAL11 SHOULD NOT BE CONSIDERED
SET MODE=INACT MSG=I SMF=I
INC DD= REAL11
```

#### 3.12.4 Messages

```
HEM12001E jobnamex stepname FAILED DUPLICATE DDNAME(ddnamexx) <userid >
```

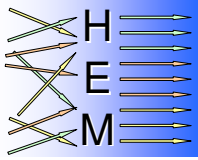
Job, step and DD name of userid filter matching – DD Name duplicate in job

```
HEM13003E jobnamex HEMDATA AREA EYECATCHER MISSING
```

Internal error: call support

```
HEM13004E jobnamex HEMDATA CANNOT BE STORED IN NTC
```

Internal error: call support



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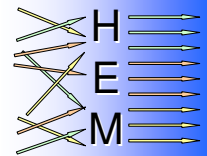
HEM00314E SMF WRITE RECORD ERROR RC=xxxxxxxx

Internal error: problem during writing SMF. See Typical SMF error codes on page 83.

### 3.12.5 Exits used

SMF Exit: IEFUJI





### 3.13 Job System Check – 13

The Job System Check function is used to verify that a specified started task or TSO user is active on the system where the job is going to be executed.

The Job System Check can also be used (*without SYSAFF Set parameter*) to fail any job matching the filter criteria's.

**ATTENTION:** These checks are done only for Batch Jobs!

#### 3.13.1 Filter Parameter

General filter keywords:

- PGMRNAME, JOBCLASS, MSGCLASS, JOB, USER, GROUP, ANY\_GROUP, DAY, TIME, SYSID and XMODE (*see general filter keywords on page 28*)

Function filter keywords:

- JOB\_ACCT(1), JOB\_ACCT(2), JOB\_ACCT(3), JOB\_ACCT(4), JOB\_ACCT(5) (*see function filter keywords on page 28*)
- FORMS (*see FORMS on page 31*)

#### 3.13.2 Set Parameter

General set keywords:

- MODE, MSG and SMF (*see general set keywords on page 29*)

Function set keywords:

- SYSAFF can be used to check the affinity of a job to the system where the given address space is currently running. For instance SYSAFF=DB2AMSTR will check address space DB2AMSTR is running on the execution system.
- FAIL: must be set to FAIL=YES (*Default NO*) to prevent jobs from executing on a wrong system.

#### 3.13.3 Coding examples

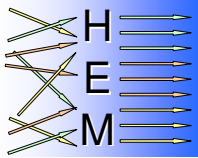
```
* JOB HEMT1301 MUST FIND
*   ADDRESS SPACE REQSPACE ACTIVE ON SYSTEM TO RUN
* SIMULATION MODE
SET  FAIL=YES MODE=SIM MSG=I SYSAFF=REQSPACE
     JOB=HEMT1301
```

```
* JOB HEMT1302 MUST FIND
*   ADDRESS SPACE REQSPACE ACTIVE ON SYSTEM TO RUN
* FAIL HEMT1302 IF NOT FOUND
SET  FAIL=YES MSG=I SYSAFF=REQSPACE
INC  JOB=HEMT1302
```

```
* JOB HEMT1303 WILL BE FAILED IF USING
*   CLASS A
*   AND
```







```
*      USER STARTING WITH Y  
SET   FAIL=YES MSG=I  
INC   JOB=HEMT1303 JOBCLASS=A USER=Y/
```

## 3.13.4 Messages

```
HEM13001I jobnamex NOT AUTHORISED TO EXECUTE ON THIS SYSTEM <userid >
```

Job of userid filter matching – NO SYSAFF parameter given – The job will be failed, because of matching the filter parameters (*if not simulation*)

- IEF452I jobnamex - JOB NOT RUN - JCL ERROR ...

```
HEM13002E jobnamex REQUIRED JOB req_adsp NOT ACTIVE <userid >
```

Job of userid filter matching – SYSAFF set parameter given – Required address space (*requ\_adsp*) not active on the system, job will be terminated (*if not simulation*)

- IEF452I jobnamex - JOB NOT RUN - JCL ERROR ...

```
HEM13003E jobnamex HEMDATA AREA EYECATCHER MISSING
```

Internal error: call support

```
HEM13004E jobnamex HEMDATA CANNOT BE STORED IN NTC
```

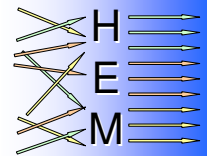
Internal error: call support

```
HEM00314E SMF WRITE RECORD ERROR RC=xxxxxxxx
```

Internal error: problem during writing SMF. See Typical SMF error codes on page 83.

## 3.13.5 Exits used

SMF Exit: IEFUJI



### 3.14 Job CPU Time Limit Set – 14

The Job CPU Time Limit Set function is used to set or replace a job CPU time limit.

**ATTENTION:** Only the job CPU time limit (*TIME parameter in the JOB JCL statement*) can be set or replaced using this function!

To understand the use of this function and of function 17 – Step CPU Time Extension Set – please refer to Step CPU Time Extension Set – 17 on page 64.

**ATTENTION:** All function numbers are indicating the order of the HEM checks. For instance function 04 “Job Jobclass Set” will be done prior Function 05 “Job Jobclass Check”. Function 14 does not follow this convention – function 14 will be done after function 11 and before function 12!

#### 3.14.1 Filter Parameter

General filter keywords:

- PGMRNAME, JOBCLASS, MSGCLASS, JOB, USER, GROUP, ANY\_GROUP, DAY, TIME, SYSID and XMODE (*see general filter keywords on page 28*)

Function filter keywords:

- JOB\_ACCT(1), JOB\_ACCT(2), JOB\_ACCT(3), JOB\_ACCT(4), JOB\_ACCT(5) (*see function filter keywords on page 28*)

#### 3.14.2 Set Parameter

General set keywords:

- MODE, MSG and SMF (*see general set keywords on page 29*)

Function set keywords:

- CPUTIME: value in seconds. Must be numeric, between 0 and 999.999. The value will be translated to a TIME=(min,sec) parameter in the JOB statement
- REPLACE=NO must be specified (*Default YES*) to prevent HEM from overtyping actual JOB time parameter

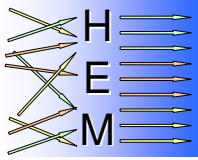
#### 3.14.3 Coding examples

```
* SET CPU TIME TO 60 SECONDS FOR JOB HEMT1401
*   WILL CREATE A TIME=(1,) JOB PARAMETER
SET CPUTIME = 60 MSG=I
INC JOB=HEMT1401
```

```
* SET CPU TIME TO 70 SECONDS FOR JOB HEMT1406
*   BUT DO NOT OVERRIDE CURRENT SETTING
*   WILL CREATE A TIME=(1,10) JOB PARAMETER
SET CPUTIME = 70 MSG=I REPLACE=NO
INC JOB=HEMT1406
```

#### 3.14.4 Messages





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```
HEM14001I jobnamex CHANGED FROM TIME(      ) TO TIME(      ,      ) WITH REPLACE  
<userid >
```

Job of userid filter matching – Job CPU time limit replaced by HEM value (*if not simulation*)

- FROM TIME: NOLIMIT, MAXIMUM, minute,ss
- TO TIME: minute,ss

```
HEM14002I jobnamex SET TO TIME(      ,      ) <userid >
```

Job of userid filter matching – Job CPU time limit set (*if not simulation*)

- TO TIME: minute,ss

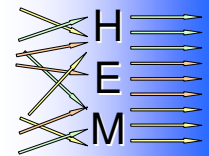
```
HEM00310E SMF WRITE RECORD ERROR RC=xxxxxxxx
```

Internal error: problem during writing SMF. See Typical SMF error codes on page 83.

### 3.14.5 Exits used

JES2 Exit: EXIT06





### 3.15 Step Region Set – 15

The Step Region Set function is used to set or replace a step region size and limit.

**ATTENTION:** only the step region limit (*REGION* parameter in the EXEC JCL statement) can be set or replaced using this function!

**ATTENTION:** currently the function does not support limitation of virtual storage above the bar (*z/Arch*).

#### 3.15.1 Filter Parameter

General filter keywords:

- PGMRNAME, JOBCLASS, MSGCLASS, JOB, USER, GROUP, ANY\_GROUP, DAY, TIME, SYSID and XMODE (see general filter keywords on page 28)

Function filter keywords:

- STEP (see function filter on page 51)
- PGM (see function filter on page 51)
- REGION: select step based on the actual (*default or given*) region definition. The comparison can also be ">" or "<" (*greater or less than*). The value must be numeric and suffixes with KB or MB. The value must be in the range 0KB-999999KB or 0MB-9765MB. The value will be reduced to a maximum of 2GB.

#### 3.15.2 Set Parameter

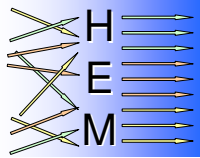
General set keywords:

- MODE, MSG and SMF (see general set keywords on page 29)

Function set keywords:

- REGION\_BELOW: region size and region limit (*as defined in exit IEFUSI*) below the line (<16MB) can be given. The values must be numeric and suffixed with KB or MB. The values must be in the range 0KB-999999KB or 0MB-9765MB. A value of 0 has a special meaning: HEM will not replace the given value. If only one parameter is given, it will be treated as the region size below and the region limit below will be defaulted to 0 (*no change in current setting*). If both parameters are given, they must be enclosed in parentheses and separated will blank or coma. The second parameter can also be given with the word "RESERVE", in which case the first parameter will be the amount of virtual storage to be kept free from high top below the line.
- REGION\_ABOVE: region size and region limit (*as defined in exit IEFUSI*) above the line (>16MB) can be given. The values must be numeric and suffixed with KB or MB. The values must be in the range 0KB-999999KB or 0MB-9765MB. A value of 0 have special meaning: HEM will not replace the given value. If only one parameter is given, it will be treated as the region size above and the region limit above will be defaulted to 0 (*no change in current setting*). If both parameters are given, they must be enclosed in parentheses and separated will blank or coma.





## 3.15.3 Coding examples

```
* FOR JOB HEMT1502
*   SET REGION SIZE BELOW TO 4MB
*       REGION LIMIT BELOW TO 5120KB
*   SET REGION SIZE ABOVE TO 64MB
*       REGION LIMIT ABOVE TO 180MB
*   ONLY SIMULATION MODE
SET REGION_BELOW=(4MB,5120KB) REGION_ABOVE=(64MB,180MB) MSG=I MODE=SIM
INC JOB=HEMT1502
```

```
* FOR JOB HEMT1503
*   SET REGION SIZE BELOW TO 4MB
*   KEEP REGION LIMIT BELOW
*   SET REGION SIZE ABOVE TO 68MB
*   KEEP REGION LIMIT ABOVE
SET REGION_BELOW=4MB REGION_ABOVE=68MB MSG=I
INC JOB=HEMT1503
```

```
* FOR JOB HEMT1504
*   SET REGION SIZE BELOW 800KB LESS
*   THAN CURRENTLY AVAILABLE
*   SET REGION SIZE ABOVE TO 68MB
*   REGION LIMIT ABOVE TO 180MB
SET REGION_BELOW=(800KB,RESERVE) REGION_ABOVE=(64MB,180MB) MSG=I MODE=ACT
INC JOB=HEMT1504
```

## 3.15.4 Messages

```
HEM15001I jobnamex stepname REGION bel_sizKB-bel_limKB/abo_sizKB-abo_limKB ASSIGNED
<userid >
```

Job of userid filter matching – Region set (*if not simulation*)

Examples:

```
HEM15001I*HEMT1502 STEP0001 REGION 0004096KB-0005120KB/0065536KB-0184320KB ASSIGNED
<YVES >
```

```
HEM15001I HEMT1503 STEP0002 REGION 0004096KB-----KB/0069632KB-----KB ASSIGNED
<YVES >
```

- **bel\_siz**: Region size below the line  
if RESERVE parameter was given, the below size will be calculated from the current available region below minus the given reserved value
- **bel\_lim**: Region limit below the line (*----- no limit given*)  
if RESERVE parameter was given, the below size limit will be the current available region
- **abo\_siz**: Region size above the line
- **abo\_lim**: Region limit above the line (*----- no limit given*)

```
HEM15002E jobnamex HEMDATA AREA PTR NOT GETMAINED
```

Internal error: call support

```
HEM15003E jobnamex HEMDATA AREA WRONG SUBPOOL
```

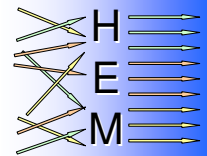
Internal error: call support



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```
HEM15004E jobnamex HEMDATA AREA EYECATCHER MISSING
```

Internal error: call support

```
HEM15005E jobnamex NO HEMDATA AVAILABLE FROM HEMUJI
```

Address space was started at a time when the HEM exit HEMUJI was not active; no filter check or action possible

```
HEM15006E jobnamex stepname REGION BELOW bel_sizKB MAXIMUM AVAILABLE max_sizKB  
<userid >
```

The requested region is not available – the job will run and the HEM15001I message will inform about the requested region. Analyze the problem and correct the job or the HEM option definitions.

```
HEM15007E jobnamex stepname REGION BELOW REQ RESERVE bel_sizKB AVAILABLE max_sizKB  
<userid >
```

The requested reserve region size is not available – the job will run with the default region! Analyze the problem and correct the job or the HEM option definitions.

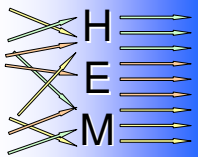
```
HEM00315E SMF WRITE RECORD ERROR RC=xxxxxxxx
```

Internal error: problem during writing SMF. See Typical SMF error codes on page 83.

### 3.15.5 Exits used

SMF Exit: IEFUSI





## 3.16 DD Line Limit Set – 16

The DD Line Limit Set function is used to set or replace a line output limit.

### 3.16.1 Filter Parameter

General filter keywords:

- PGMRNAME, JOBCLASS, MSGCLASS, JOB, USER, GROUP, ANY\_GROUP, DAY, TIME, SYSID and XMODE (see general filter keywords on page 28)

Function filter keywords:

- STEP (see function filter on page 51)
- PGM (see function filter on page 51)
- DD (see function filter on page 53)
- SYSOUT: filter based on output class – max 1 character – 0-9 or A-Z – multiple filters must be enclosed in parentheses and separated with blank or coma

### 3.16.2 Set Parameter

General set keywords:

- MODE, MSG and SMF (see general set keywords on page 29)

Function set keywords:

- LINES: a new limit on the number of output lines can be given. The values must be numeric and in the range 0-99999999.
- REPLACE=NO must be specified (Default YES) to prevent HEM from overtyping actual DD statement output lines limit parameter

### 3.16.3 Coding examples

```
* SET OUTPUT LINE LIMIT TO 19 FOR JOB HEMT1601 AND DD SYSUT2 -  
* REPLACE ANY GIVEN LIMIT  
SET LINES=19 REPLACE=YES  
INC DD=SYSUT2 JOB=HEMT1601
```

```
* SET OUTPUT LINE LIMIT TO 19 FOR JOB HEMT1603 AND DD SYSUT2 -  
* DO NOT REPLACE ANY GIVEN LIMIT  
SET LINES=19 REPLACE=NO  
INC DD=SYSUT2 JOB=HEMT1603
```

### 3.16.4 Messages

```
HEM16001I jobnamex ddnamexx CHANGED TO LINE LIMIT(new_lim) <userid >
```

Job, DD name of userid filter matching – Output line limit set without replace parameter (if not simulation)

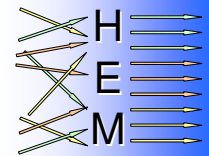
```
HEM16002I jobnamex ddnamexx CHANGED TO LINE LIMIT(new_lim) WITH REPLACE  
<userid >
```



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Job, DD name of userid filter matching – Output line limit set with replace parameter  
(if not simulation)

```
HEM16003I jobnamex ddnamexx CHANGED TO LINE LIMIT(new_lim) WITH REPLACE  
FROM(old_lim) <userid >
```

Job, DD name of userid filter matching – Output line limit overrides the old value (if  
not simulation)

```
HEM16004E jobnamex HEMDATA AREA PTR NOT GETMAINED
```

Internal error: call support

```
HEM16005E jobnamex HEMDATA AREA WRONG SUBPOOL
```

Internal error: call support

```
HEM16006E jobnamex HEMDATA AREA EYECATCHER MISSING
```

Internal error: call support

```
HEM16007E jobnamex NO HEMDATA AVAILABLE FROM HEMUJI
```

Address space was started at a time when the HEM HEMUJI exit was not active; no  
filter check or action possible

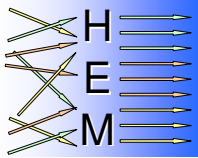
```
HEM00311E SMF WRITE RECORD ERROR RC=xxxxxxxx
```

Internal error: problem during writing SMF. See Typical SMF error codes on page 83.

### 3.16.5 Exits used

JES2 Exit: EXIT31





## 3.17 Step CPU Time Extension Set – 17

The Step CPU Time Extension Set function is used to extend the step CPU time limit. If the CPU time limit has expired and no extension is given, then MVS will abend the job with an abend code S322.

HEM also offers the possibility to ask the operator to take an action (*extend by the defined amount of seconds or abend*).

**ATTENTION:** for several years the IEFUTL SMF exit has been taken asynchronously; the current program continues to run during IEFUTL SMF processing. The HEMUTL tries to stop the processing of all other TCBs while the operator reply is waiting for a response; but this does not always work, since some TCBs are marked “not stoppable” by MVS (*for instance REXX...*).

**ATTENTION:** the CPU time extension works on a step basis independently of whether the JOB or STEP CPU time limit has been reached! There follows some explanation and examples of the interactions of JOB CPU (*Set: Function 14*) and STEP CPU Time Limits (*Extension: Function 17*):

1. the JOB CPU Time, as defined in the JOB statement or set by the function 14 – Job CPU Time Limit Set – will control the CPU usage of all Steps (*the addition of all Step CPU usage!*)
2. the STEP CPU Time, as defined in the EXEC statement (*NO HEM function can set this value!*), will limit the usage of the current step
3. both – JOB and/or STEP – limits could be reached and could be handled within function 17 – Step CPU Time Extension Set.

1. a Job has a defined JOB CPU limit and a REPLACE=YES (*Default*) definition within function 14 – the JOB CPU limit will be taken from HEM – the new JOB CPU Time Limit will be 15 and the job (*any step, when the job CPU total has exceeded 15*) will be cancelled after 15 CPU seconds have been consumed (*small differences are possible – MVS behaviour*)

### a. JCL

```
//CPUJOB01 JOB ...,TIME=(,20)
```

### b. HEM definition – function 14 – Job CPU Time Limit Set

```
* STOP THE JOB AFTER 15 SECONDS CPU - REPLACE JOB TIME VALUE (DEFAULT)  
SET CPUTIME = 15 MSG=I REPLACE=YES  
INC JOB=CPUJOB01
```

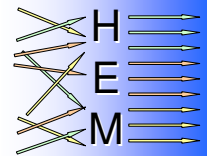
### c. Output

```
...  
HEM14001I CPUJOB01 CHANGED FROM TIME(      ,20) TO TIME(      ,15) WITH REPLACE  
...  
IEF450I CPUJOB01 PRIN1 - ABEND=S322 U0000 REASON=00000000  
...  
IEF376I JOB/CPUJOB01/STOP 2007080.1011 CPU 0MIN 16.27SEC  
...
```

2. a Job has a defined JOB CPU limit and a REPLACE=NO definition within function 14 – the JOB CPU limit will not be taken from HEM – the job (*any step,*

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when the job CPU total has exceeded 20) will be cancelled after 20 CPU seconds have been consumed (small differences are possible – MVS behaviour)

### a. JCL

```
//CPUJOB02 JOB ...,TIME=(,20)
```

### b. HEM definition – function 14 – Job CPU Time Limit Set

```
* STOP THE JOB AFTER 15 SECONDS CPU - DO NOT REPLACE JOB TIME VALUE
SET CPUTIME = 15 MSG=I REPLACE=NO
INC JOB=CPUJOB02
```

### c. Output

```
...
IEF450I CPUJOB02 PRIN1 - ABEND=S322 U0000 REASON=00000000
...
IEF376I JOB/CPUJOB02/STOP 2007080.1016 CPU 0MIN 21.29SEC
...
```

- a Job has a STEP with a defined CPU limit and a definition within function 14 – the JOB CPU limit will be taken from HEM – the new JOB CPU Time Limit will be 15 and the job (any step, when the job CPU total has exceeded 15) will be cancelled after 15 CPU seconds have been consumed (small differences are possible – MVS behaviour)

### a. JCL

```
//CPUJOB01 JOB
//PRIN1 EXEC PGM=ASMLoop,TIME=(,20)
```

### b. HEM definition – function 14 – Job CPU Time Limit Set

```
* STOP THE JOB AFTER 15 SECONDS CPU - REPLACE JOB TIME VALUE (DEFAULT)
SET CPUTIME = 15 MSG=I REPLACE=YES
INC JOB=CPUJOB01
```

### c. Output

```
...
HEM14002I CPUJOB01 SET TO TIME( ,15) <YVES >
...
IEF450I CPUJOB01 PRIN1 - ABEND=S322 U0000 REASON=00000000
...
IEF376I JOB/CPUJOB01/STOP 2007080.1023 CPU 0MIN 16.02SEC
...
```

- a Job has two STEPs with a defined CPU limit and a definition within function 14 – the JOB CPU limit will be taken from HEM – the new JOB CPU Time Limit will be 15 and the job (any step, when the job CPU total has exceeded 15) will be cancelled after 15 CPU seconds have been consumed (small differences are possible – MVS behaviour). Every Step will be cancelled after 10 Seconds CPU usage since every Step is limited

### a. JCL

```
//CPUJOB01 JOB
//PRIN1 EXEC PGM=ASMLoop,TIME=(,10)
//PRIN2 EXEC PGM=ASMLoop,TIME=(,10)
```

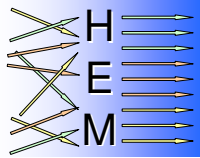
### b. HEM definition – function 14 – Job CPU Time Limit Set

```
* STOP THE JOB AFTER 15 SECONDS CPU - REPLACE JOB TIME VALUE (DEFAULT)
SET CPUTIME = 15 MSG=I REPLACE=YES
INC JOB=CPUJOB01
```

### c. Output

```
...
HEM14002I CPUJOB01 SET TO TIME( ,15) <YVES >
```





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```
...
IEF450I CPUJOB01 PRIN1 - ABEND=S322 U0000 REASON=00000000
...
IEF374I STEP/PRIN1 /STOP 2007080.1030 CPU 0MIN 10.76SEC
...
IEF376I JOB/CPUJOB01/STOP 2007080.1030 CPU 0MIN 10.76SEC
...
```

5. a Job has two STEPs with a defined CPU limit and a definition within function 14 – the JOB CPU limit will be taken from HEM – the new JOB CPU Time Limit will be 25 and a definition within function 17 to add 5 CPU seconds to Steps abending because of Step CPU Time Limit. The Step CPU Time extension set – function 17 – will be entered as soon the job (*any step, when the job CPU total has exceeded 25*) has consumed more than 25 CPU seconds and as soon as any STEP has consumed more than 10 seconds (*small differences are possible – MVS behaviour*). Every Step will be cancelled after 10 Seconds CPU usage since every Step is limited

a. JCL

```
//CPUJOB03 JOB
//PRIN1 EXEC PGM=ASMLoop, TIME=(, 10)
//PRIN2 EXEC PGM=ASMLoop, TIME=(, 10)
```

b. HEM definition – function 14 – Job CPU Time Limit Set

```
* STOP THE JOB AFTER 25 SECONDS CPU - REPLACE JOB TIME VALUE (DEFAULT)
SET CPUTIME = 25 MSG=I
INC JOB=CPUJOB03
```

c. HEM definition – function 17 – Step CPU Time Ext. Set

```
* EXTENT STEP CPU TIME BY 5 SECONDS FOR JOB CPUJOB03
SET EXT_CPUTIME = 5 MODE=ACT
INC JOB=CPUJOB03
```

d. Output

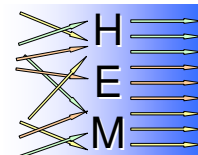
```
...
HEM14002I CPUJOB03 SET TO TIME( ,25) <YVES >
...
HEM17002I CPUJOB03 PRIN1 CPU TIME LIMIT EXT BY 000005 SECS - 00000010 USED -
STP LIM <YVES >
HEM17002I CPUJOB03 PRIN1 CPU TIME LIMIT EXT BY 000005 SECS - 00000015 USED -
STP LIM <YVES >
HEM17002I CPUJOB03 PRIN2 CPU TIME LIMIT EXT BY 000005 SECS - 00000005 USED -
JOB LIM <YVES >
HEM17002I CPUJOB03 PRIN2 CPU TIME LIMIT EXT BY 000005 SECS - 00000010 USED -
JOB LIM <YVES >
HEM17002I CPUJOB03 PRIN2 CPU TIME LIMIT EXT BY 000005 SECS - 00000016 USED -
JOB LIM <YVES >
...
IEF374I STEP/PRIN1 /STOP 2007080.1139 CPU 0MIN 20.17SEC
...
IEF374I STEP/PRIN2 /STOP 2007080.1139 CPU 0MIN 20.44SEC
...
IEF376I JOB/CPUJOB03/STOP 2007080.1139 CPU 0MIN 40.61SEC
...
```

e. Explanation

first HEMT17002: the Step PRIN1 has consumed more than the 10 CPU seconds defined in the STEP statement – CPU Time extended by 5 seconds for this Step

second HEMT17002: the Step PRIN1 has consumed more than the 10+5 seconds – CPU Time extended by 5 seconds for this Step





third HEMT17002: the Step PRIN2 has consumed more than the 25 seconds defined for the Job – CPU Time extended by 5 seconds for this Step

fourth HEMT17002: the Step PRIN2 has consumed more than the 25+5 seconds defined for the Job – CPU Time extended by 5 seconds for this Step

fifth HEMT17002: the Step PRIN2 has consumed more than the 25+5+5 seconds defined for the Job – CPU Time extended by 5 seconds for this Step

### 3.17.1 Filter Parameter

General filter keywords:

- PGMRNAME, JOBCLASS, MSGCLASS, JOB, USER, GROUP, ANY\_GROUP, DAY, TIME, SYSID and XMODE (see general filter keywords on page 28)

Function filter keywords:

- STEP (see function filter on page 51)
- PGM (see function filter on page 51)
- CPUTIME: filter based on the actual CPU consumption of the step (**ATTENTION**: not the job!). The comparison can also be ">" or "<" (greater or less than). The value must be numeric and in the range 0-999.999.:

### 3.17.2 Set Parameter

General set keywords:

- MODE, MSG and SMF (see general set keywords on page 29)

Function set keywords:

- EXT\_CPUTIME: step CPU extension in seconds. The values must be numeric and in the range 0-999.999.
- ASKOP=YES must be specified (Default NO), if the operator is to decide between "extention" (CONT) or "abend" (CANCEL). Using ASKOP will result in a WTOR.

```
HEM17001A jjjjjjjj nnnnnnnn SECONDS CPU TIME REACHED - REPLY 'CONT' OR 'CANCEL'
```

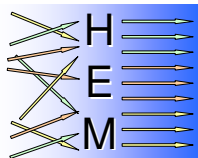
- jjjjjjjj – Jobname
- nnnnnnnn – actual step CPU time consumption

### 3.17.3 Coding examples

```
* EXTENT STEP CPU TIME BY 60 SECONDS FOR JOB HEMTALLF
SET EXT_CPUTIME = 60 ASKOP=NO MODE=ACT
INC JOB=HEMTALLF
```

```
* EXTENT STEP CPU TIME BY 5 SECONDS FOR JOB HEMT1701 -
* WHILE TOTAL CPUTIME LESS THAN 600 - AFTER ABEND S322
* EVERYTIME ASK THE OPERATOR
SET EXT_CPUTIME = 5 ASKOP=YES
```





```
INC JOB=HEMT1701 CPUTIME < 600
```

## 3.17.4 Messages

```
HEM17001A jobnamex nnnnnnnn SECONDS CPU TIME REACHED - REPLY 'CONT' OR 'CANCEL'
```

Job of userid filter matching – CPU time limit reached and ASKOP=YES coded.

- Reply CONT to extent the wait time
- Reply CANCEL to abend the job with S322

```
HEM17002I jobnamex stepname CPU TIME LIMIT EXT BY nnnnnn SECS - nnnnnnnn USED - xxx  
LIM <userid >
```

Job Step of userid filter matching – CPU time limit extended (*if not simulation*)

CPU TIME LIMIT EXT BY nnnnnn SECS – extention of CPU time based on HEM definition

nnnnnnnn USED – CPU usage of the current Step

xxx LIM – JOB or STP (*Step*) Limit reached

```
HEM17004E jobnamex HEMDATA AREA PTR NOT GETMAINED
```

Internal error: call support

```
HEM17005E jobnamex HEMDATA AREA WRONG SUBPOOL
```

Internal error: call support

```
HEM17006E jobnamex HEMDATA AREA EYECATCHER MISSING
```

Internal error: call support

```
HEM17003E jobnamex NO HEMDATA AVAILABLE FROM HEMUJI
```

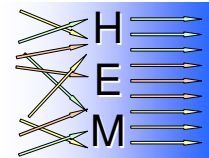
Address space was started at a time when the HEM HEMUJI exit was not active; no filter check or action possible

```
HEM00316E SMF WRITE RECORD ERROR RC=xxxxxxxx
```

Internal error: problem during writing SMF. See Typical SMF error codes on page 83.

## 3.17.5 Exits used

SMF Exit: IEFUTL



### 3.18 Step Wait Time Extention Set – 18

The Step Wait Time Extention Set function is used to extend the Step Wait Time limit. If the Wait Time limit has expired and no extention is given, then MVS will abend the job with an abend code S522.

HEM also offers the possibility of asking the operator to take an action (*extent or abend*).

#### 3.18.1 Filter Parameter

General filter keywords:

- PGMRNAME, JOBCLASS, MSGCLASS, JOB, USER, GROUP, ANY\_GROUP, DAY, TIME, SYSID and XMODE (*see general filter keywords on page 28*)

Function filter keywords:

- STEP (*see function filter on page 51*)
- PGM (*see function filter on page 51*)
- WAITTIME: filter based on the actual Wait Time of the step. The comparison can also be ">" or "<" (*greater or less than*). The value must be numeric. The value must be in the range 0-999.999.:

#### 3.18.2 Set Parameter

General set keywords:

- MODE, MSG and SMF (*see general set keywords on page 29*)

Function set keywords:

- EXT\_WAITTIME: Step Wait extention in seconds. The values must be numeric. The values must be in the range 0-999.999.
- ASKOP=YES must be specified (*Default NO*), if the operator is to decide between "extention" (*CONT*) or "abend" (*CANCEL*). Using ASKOP will result in a WTOR.

```
HEM18001A jjjjjjjj nnnnnnnn SECONDS WAIT TIME REACHED - REPLY 'CONT' OR 'CANCEL'
```

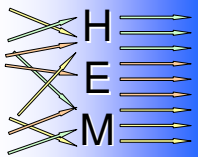
- jjjjjjjj – Jobname
- nnnnnnnn – actual Step Wait time consumption

#### 3.18.3 Coding examples

```
* EXTENT WAIT TIME BY 600 SECONDS FOR JOB YVES
SET  EXT_WAITTIME = 600 MODE=ACT MSG=I
INC  JOB=YVES
```

```
* EXTENT WAIT TIME BY 60 SECONDS FOR JOB HEMT1801 -
*   WHILE TOTAL WAITTIME LESS THAN 600 - AFTER ABEND S522
*   EVERYTIME ASK THE OPERATOR
SET  EXT_WAITTIME = 60 MODE=ACT MSG=I ASKOP=YES
INC  JOB=HEMT1801 WAITTIME < 600
```





## 3.18.4 Messages

```
HEM18001A jobnamex nnnnnnnn SECONDS WAIT TIME REACHED - REPLY 'CONT' OR 'CANCEL'
```

Job of userid filter matching – Wait time limit reached and ASKOP=YES coded.

- Reply CONT to extend the wait time
- Reply CANCEL to abend the job with S522

```
HEM18002I jobnamex WAIT TIME LIMIT EXTENDED BY nnnnnn SECONDS <userid >
```

Job of userid filter matching – Wait time limit extended (*if not simulation*)

```
HEM17004E jobnamex HEMDATA AREA PTR NOT GETMAINED
```

Internal error: call support

```
HEM17005E jobnamex HEMDATA AREA WRONG SUBPOOL
```

Internal error: call support

```
HEM17006E jobnamex HEMDATA AREA EYECATCHER MISSING
```

Internal error: call support

```
HEM17003E jobnamex NO HEMDATA AVAILABLE FROM HEMUJI
```

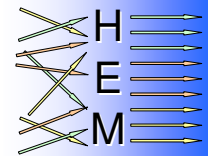
Address space was started at a time when the HEM HEMUJI exit was not active; no filter check or action possible

```
HEM00316E SMF WRITE RECORD ERROR RC=xxxxxxxx
```

Internal error: problem during writing SMF. See Typical SMF error codes on page 83.

## 3.18.5 Exits used

SMF Exit: IEFUTL



### 3.19 DD Line Extention Set – 19

The DD Line Extention Set function is used to extend the DD output line limit. If the DD output line limit has been exceeded and no extention is given, then MVS will abend the job with an abend code S722.

#### 3.19.1 Filter Parameter

General filter keywords:

- PGMRNAME, JOBCLASS, MSGCLASS, JOB, USER, GROUP, ANY\_GROUP, DAY, TIME, SYSID and XMODE (see general filter keywords on page 28)

Function filter keywords:

- STEP (see function filter on page 51)
- PGM (see function filter on page 51)
- DD (see function filter on page 53)
- SYSOUT (see function filter on page 62)
- FORMS (see function filter on page 31)
- LINES: filter based on the number of output lines of a Sysout DD statement. The comparison can also be ">" or "<" (greater or less than). The value must be numeric and in the range 0-9999999.
- LRECL: filter based on the LRECL of a Sysout DD statement. The comparison can also be ">" or "<" (greater or less than). The value must be numeric and in the range 8-32.760.LRECL:
- FCB: filter based on the FCB of a Sysout DD statement. The value must be 1-4 characters and can be generic. Multiple filters must be enclosed in parentheses and separated with blank or coma.FCB:
- DEST: filter based on the destination of a Sysout DD statement. The value must be 1-17 characters (also in the form node.userid) and can be generic. Multiple filters must be enclosed in parentheses and separated with blank or coma.DEST:

#### 3.19.2 Set Parameter

General set keywords:

- MODE, MSG and SMF (see general set keywords on page 29)

Function set keywords:

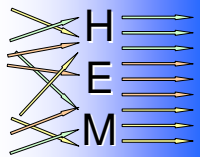
- EXT\_LINES: the number of lines by which the output lines limit is to be extended. The values must be numeric and in the range 0-999.999.

#### 3.19.3 Coding examples

```
* EXTENT LINES BY 1000 OF JOB HEMTALF
*   BUT LET ABEND S722 AFTER 10000 LINES + OUTLIM
SET EXT_LINES = 1000
INC JOB=HEMTALF LINES < 10000
```







## 3.19.4 Messages

```
HEM19001I jobnamex DD LINE LIMIT EXTENDED BY nnnnnnnn LINES <userid >
```

Job of userid filter matching – Line limit extended (*if not simulation*)

```
HEM19004E jobnamex HEMDATA AREA PTR NOT GETMAINED
```

Internal error: call support

```
HEM19005E jobnamex HEMDATA AREA WRONG SUBPOOL
```

Internal error: call support

```
HEM19006E jobnamex HEMDATA AREA EYECATCHER MISSING
```

Internal error: call support

```
HEM19007E jobnamex NO HEMDATA AVAILABLE FROM HEMUJI
```

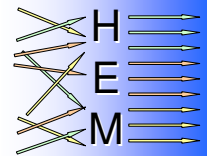
Address space was started at a time when the HEM HEMUJI exit was not active; no filter check or action possible

```
HEM00315E SMF WRITE RECORD ERROR RC=xxxxxxxx
```

Internal error: problem during writing SMF. See Typical SMF error codes on page 83.

## 3.19.5 Exits used

SMF Exit: IEFUSO



### 3.20 DD Sysout Set – 20

The DD Sysout Set function is used to change most of the characteristics of a Sysout DD statement.

#### 3.20.1 Filter Parameter

General filter keywords:

- PGMRNAME, JOBCLASS, MSGCLASS, JOB, USER, GROUP, ANY\_GROUP, DAY, TIME, SYSID and XMODE (see general filter keywords on page 28)

Function filter keywords:

- STEP (see function filter on page 51)
- PGM (see function filter on page 51)
- DD (see function filter on page 53)
- SYSOUT (see function filter on page 62)
- FORMS (see function filter on page 31)
- LINES (see function filter on page 73)
- LRECL (see function filter on page 73)
- FCB (see function filter on page 73)
- DEST (see function filter on page 73)
- WRITER: filter based on the writer of a Sysout DD statement. The value must be 1 to 8 characters and can be generic. Multiple filters must be enclosed in parentheses and separated with blank or coma.
- PAGES: filter based on the number of pages of a Sysout DD statement. The comparison can also be ">" or "<" (greater or less than). The value must be numeric and in the range 0-99999999.PAGES:
- UCS: filter based on the UCS of a Sysout DD statement. The value must be 1 to 4 characters and can be generic. Multiple filters must be enclosed in parentheses and separated with blank or coma.

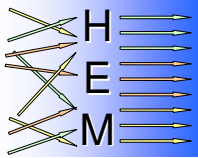
#### 3.20.2 Set Parameter

General set keywords:

- MODE, MSG and SMF (see general set keywords on page 29)

Function set keywords:

- SYSOUT: a new sysout output class can be given. The value must be 0-9 or A-Z.
- WRITER: a new writer can be given. The value must be 1 to 8 characters.
- FORMS: a new form can be given. The value must be 1 to 8 characters and can be single quoted.
- DEST: a new destination can be given. The value must be 1 to 17 characters (also in the form node.userid).



- HOLD: the output can be changed to Hold (*HOLD=YES*) or Non-Hold (*HOLD=NO*).

### 3.20.3 Coding examples

```
* CHANGE OUTPUT OF JOB HEMTALLF DD YVESOUT SYSOUT NOT EQUAL Z TO
*   NEW SYSOUT          A
*   NEW WRITER          WRITER78
*   NEW FORMS           F9876
*   NEW DESTINATION NDST
*   NEW NOT HOLD
SET MODE=ACT SYSOUT=A WRITER=WRITER78 FORMS=F9876 DEST=NDST HOLD=NO
INC  JOB=HEMTALLF DD=YVESOUT SYSOUT^=Z
```

### 3.20.4 Messages

```
HEM20001I jobnamex ddnamexx CHANGED FROM SYSOUT(x) TO SYSOUT(y) <userid >
```

Job, DD name of userid filter matching – Sysout class changed (*if not simulation*)

```
HEM20002I jobnamex ddnamexx CHANGED FROM WRITER(old_writ) TO WRITER(new_writ)
<userid >
```

Job, DD name of userid filter matching – Writer changed (*if not simulation*)

```
HEM20003I jobnamex ddnamexx CHANGED FROM FORMS(old_form) TO FORMS(new_form)
<userid >
```

Job, DD name of userid filter matching – Forms changed (*if not simulation*)

```
HEM20004I jobnamex ddnamexx CHANGED TO HOLD(xxx) <userid >
```

Job, DD name of userid filter matching – Hold mode changed (*YES/NO*) (*if not simulation*)

```
HEM20005I jobnamex ddnamexx CHANGED FROM DEST(old_dest) TO DEST(new_dest)
<userid >
```

Job, DD name of userid filter matching – Output destination changed (*if not simulation*)

```
HEM22002E jobnamex HEMDATA AREA PTR NOT GETMAINED
```

Internal error: call support

```
HEM22003E jobnamex HEMDATA AREA WRONG SUBPOOL
```

Internal error: call support

```
HEM22004E jobnamex HEMDATA AREA EYECATCHER MISSING
```

Internal error: call support

```
HEM22005E jobnamex NO HEMDATA AVAILABLE FROM HEMUJI
```

Address space was started at a time when the HEM HEMUJI exit was not active; no filter check or action possible

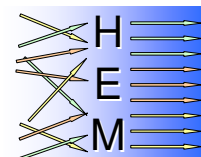
```
HEM00312E SMF WRITE RECORD ERROR RC=xxxxxxxx
```

Internal error: problem during writing SMF. See Typical SMF error codes on page 83.



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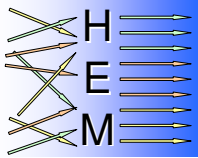
---



## 3.20.5 Exits used

JES2 Exit: EXIT048





## 3.21 DD Output Priority Set – 21

The DD Output Priority Set function is used to change the output priority of a Sysout DD statement.

### 3.21.1 Filter Parameter

General filter keywords:

- PGMRNAME, JOBCLASS, MSGCLASS, JOB, USER, GROUP, ANY\_GROUP, DAY, TIME, SYSID and XMODE (see general filter keywords on page 28)

Function filter keywords:

- STEP (see function filter on page 51)
- PGM (see function filter on page 51)
- DD (see function filter on page 53)
- SYSOUT (see function filter on page 62)
- FORMS (see function filter on page 31)
- LINES (see function filter on page 73)
- LRECL (see function filter on page 73)
- FCB (see function filter on page 73)
- DEST (see function filter on page 73)
- WRITER (see function filter on page 75)
- PAGES (see function filter on page 75)
- UCS (see function filter on page 75)

### 3.21.2 Set Parameter

General set keywords:

- MODE, MSG and SMF (see general set keywords on page 29)

Function set keywords:

- OUT\_PRIORITY: a new sysout output priority can be given. The value must be numeric and in the range 0-255.

### 3.21.3 Coding examples

```
* CHANGE OUTPUT PRIORITY OF JOB HEMTALLF DD YVESOUT TO 70
SET  MODE=ACT MSG=I OUT_PRIORITY=70
INC  JOB=HEMTALLF DD=YVESOUT
```

### 3.21.4 Messages

```
HEM21001I jobnamex ddnamexx CHANGED FROM OUTPUT PRIORITY (old) TO PRIORITY(new)
<userid >
```

Job, DD name of userid filter matching – Output priority changed (if not simulation)

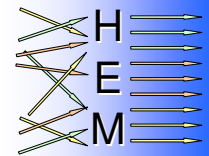
```
HEM22002E jobnamex HEMDATA AREA PTR NOT GETMAINED
```



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---



Internal error: call support

```
HEM22003E jobnamex HEMDATA AREA WRONG SUBPOOL
```

Internal error: call support

```
HEM22004E jobnamex HEMDATA AREA EYECATCHER MISSING
```

Internal error: call support

```
HEM22005E jobnamex NO HEMDATA AVAILABLE FROM HEMUJI
```

Address space was started at a time when the HEM HEMUJI exit was not active; no filter check or action possible

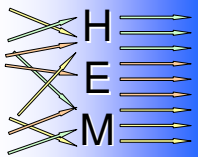
```
HEM00312E SMF WRITE RECORD ERROR RC=xxxxxxxx
```

Internal error: problem during writing SMF. See Typical SMF error codes on page 83.

### 3.21.5 Exits used

JES2 Exit: EXIT048





## 3.22 DD Outdisp Set – 22

The DD Outdisp Set function is used to change the output disposition of a Sysout DD statement.

### 3.22.1 Filter Parameter

General filter keywords:

- PGMRNAME, JOBCLASS, MSGCLASS, JOB, USER, GROUP, ANY\_GROUP, DAY, TIME, SYSID and XMODE (see general filter keywords on page 28)

Function filter keywords:

- STEP (see function filter on page 51)
- PGM (see function filter on page 51)
- DD (see function filter on page 53)
- SYSOUT (see function filter on page 62)
- FORMS (see function filter on page 31)
- LINES (see function filter on page 73)
- LRECL (see function filter on page 73)
- FCB (see function filter on page 73)
- DEST (see function filter on page 73)
- WRITER (see function filter on page 75)
- PAGES (see function filter on page 75)
- UCS (see function filter on page 75)

### 3.22.2 Set Parameter

General set keywords:

- MODE, MSG and SMF (see general set keywords on page 29)

Function set keywords:

- OUTDISP: a new sysout output disposition can be given. The output disposition must be given in the form OUTDISP=(normdisp,abnormdisp) or OUTDISP=normdisp (the abnormal disposition will remain unchanged). Normal and abnormal disposition can be set to:
  - WRITE – ready to print out (and then purge)
  - HOLD – keep on spool (no print)
  - KEEP – ready to print out and then leave
  - LEAVE – keep on spool (if released, will become keep)
  - PURGE – delete from spool

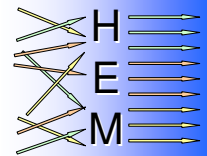
### 3.22.3 Coding examples

```
* CHANGE OUTDISP OF JOB HEMTALLF FOR DD YVESOUT TO KEEP, KEEP
SET  MODE=ACT MSG=I OUTDISP=(KEEP, KEEP)
     JOB=HEMTALLF DD=YVESOUT
```



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```
* CHANGE OUTDISP OF JOB HEMT2204 FOR DD SYSUT2 TO HOLD -  
* DO NO CHANGE THE ABNORMAL DISPOSITION  
SET  MODE=ACT MSG=I OUTDISP=HOLD  
     JOB=HEMT2204 DD=SYSUT2
```

### 3.22.4 Messages

```
HEM22001I jobnamex ddnamexx CHANGED TO OUTDISP(ndisp,adisp) <userid >
```

Job, DD name of userid filter matching – Output disposition changed (*if not simulation*)

- ndisp = WRITE, HOLD, KEEP, LEAVE, PURGE
- adisp =WRITE, HOLD, KEEP, LEAVE, PURGE, ----- (*unchanged*)

```
HEM22002E jobnamex HEMDATA AREA PTR NOT GETMAINED
```

Internal error: call support

```
HEM22003E jobnamex HEMDATA AREA WRONG SUBPOOL
```

Internal error: call support

```
HEM22004E jobnamex HEMDATA AREA EYECATCHER MISSING
```

Internal error: call support

```
HEM22005E jobnamex NO HEMDATA AVAILABLE FROM HEMUJI
```

Address space was started at a time when the HEM HEMUJI exit was not active; no filter check or action possible

```
HEM00312E SMF WRITE RECORD ERROR RC=xxxxxxxx
```

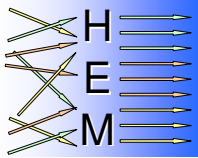
Internal error: problem during writing SMF. See Typical SMF error codes on page 83.

### 3.22.5 Exits used

JES2 Exit: EXIT048







## 3.23 Step Abend Set – 23

The Step Abend Set function is used to change a step condition code to an abend code. This function is for instance useful for job scheduling tools which prefer abends to condition codes.

### 3.23.1 Filter Parameter

General filter keywords:

- PGMNAME, JOBCLASS, MSGCLASS, JOB, USER, GROUP, ANY\_GROUP, DAY, TIME, SYSID and XMODE (see general filter keywords on page 28)

Function filter keywords:

- STEP (see function filter on page 51)
- PGM (see function filter on page 51)
- RC: filter based on the step return code. The comparison can also be ">" or "<" (greater or less than). The value must be numeric and in the range 0-32760.RC:

### 3.23.2 Set Parameter

General set keywords:

- MODE, MSG and SMF (see general set keywords on page 29)

Function set keywords:

- FAIL: must be set to FAIL=YES (Default NO) to prevent jobs from executing. The condition code will be changed to a user abend code.

```
HEM23001E HEMSSiy2 ST10 TESTSFR RETURN CODE=0123 ABENDED <YVES >  
IEF472I HEMSSiy2 ST10 - COMPLETION CODE - SYSTEM=000 USER=0123 REASON=00000000
```

### 3.23.3 Coding examples

```
* FAIL ANY JOB USING PROGRAM TESTSFR AND RC GREATER 0  
SET FAIL=YES MODE=ACT MSG=I  
INC RC >0 PGM=TESTSFR
```

```
* FAIL JOB=HEMSSiy1 AND RC GREATER 4 BUT LESS THAN 12  
SET FAIL=YES MODE=ACT MSG=I  
INC RC >4 RC <12 JOB=HEMSSiy1
```

### 3.23.4 Messages

```
HEM23001E jobnamex stepname pgmnamex RETURN CODE=xxxx ABENDED <userid >
```

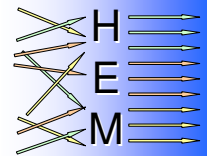
Job, step, program of userid filter matching – return code – abended (if not simulation)

```
HEM23002E jobnamex HEMDATA AREA PTR NOT GETMAINED
```

Internal error: call support

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```
HEM23003E jobnamex HEMDATA AREA WRONG SUBPOOL
```

Internal error: call support

```
HEM23004E jobnamex HEMDATA AREA EYECATCHER MISSING
```

Internal error: call support

```
HEM23005E jobnamex NO HEMDATA AVAILABLE FROM HEMUJI
```

Address space was started at a time when the HEM HEMUJI exit was not active; no filter check or action possible

```
HEM00318E SMF WRITE RECORD ERROR RC=xxxxxxxx
```

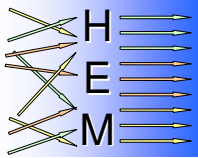
Internal error: problem during writing SMF. Typical SMF error codes

- 08 (x'08') The record was not written because the length specified in the RDW was less than 18 bytes.
- 16 (x'10') The record was not written because SMF is not active or has ended abnormally.
- 20 (x'14') The record was not written because the installation-written IEFU83, IEFU84, or IEFU85 exit routine suppressed the record.
- 24 (x'18') The record was not written because the data was lost.
- 36 (x'24') The record was not written because the record type specified is not currently being recorded.
- 40 (x'28') The record was not written because a buffer shortage caused the data to be lost.
- 44 (x'2C') The record was not written because SMF could not establish recovery.
- 48 (x'30') The caller was not in primary ASC mode or an incorrect ASID was encountered.

### 3.23.5 Exits used

SSI: Code 50





## 3.24 HEM – Messages

- HEM messages have the following structure:

```
HEM##yyyxs
```

- ##: the function
  - 00 – started task messages and system messages
  - 01-23 – function messages
  - CK – HEMCKMOD utility
  - CO – HEMCOLD utility
  - RF – HEMRFRSH utility
  - TR – HEMTRACE function
- yyy: number
- x: message severity
  - I – information
  - E – error
- \*: simulation mode

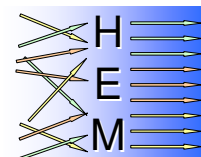
- HEM tracing messages (*HEMTRACE*) have the following structure:

```
HEMTRyyyx
```

- general tracing messages
  - yyy: number
  - x: message severity
    - I – information
    - E – error

```
HEMT##yyyxs
```

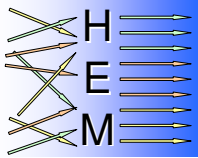
- function tracing messages
  - ##: the function
    - 01-23 – function messages
  - yy: number
  - x: message severity
    - I – information
    - E – error
  - \*: simulation mode



## 4 HEM Installation

HEM is designed to be installed dynamically. Only the JES2 definitions must have been done previously.





## 4.1 HEM Datasets

HEM needs the following datasets:

### 4.1.1 PDSELIB

See PDSELIB on page 3.

A base PDSELIB will be delivered under SYS4M.HEM.PDSELIB (*53 members*).

### 4.1.2 PARMLIB

See PARMLIB on page 5.

A base PARMLIB can be allocated and will be filled using the HEM ISPF.

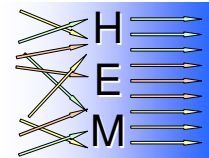
### 4.1.3 LOADLIB

The HEM Loadlib can be a PDS or a PDSE – this dataset should be defined with the following characteristics:

- a. Organization . . . : PO
- b. Record format . . . : U
- c. Record length . . . : 0
- d. Block size . . . . : 32760
- e. 1st extent tracks . : 30 (Minimum)
- f. Secondary tracks . : 30 (Minimum)

The Loadlib will be delivered under SYS4M.HEM.LOADLIB and contains 19 Members:

- HEMSTC: Main Started Task Routine
- HEMSTCCM: Started Task Command interface
- HEMSSI: initialization of subsystem HEMS – function 23 (*Step Abend Set – see page 82*)
- HEMX020: JES2 Exit 20 – old front end of Exit 50
- HEMX050: JES2 Exit 50 – functions 1 (*Jobname Check – see page 28*), 2 (*Job Account Code Set – see page 31*), 3 (*Job Account Codes Check – see page 33*), 4 (*Job Jobclass Set – see page 35*), 5 (*Job Jobclass Check – see page 37*), 6 (*Job Msgclass Set – see page 39*), 7 (*Job Programmer Name Set – see page 41*), 8 (*Job System Set – see page 43*), 9 (*Job Duplicate Check – see page 47*), 10 (*Job Input Priority Set – see page 49*)
- HEMX006: JES2 Exit 6 – functions 14 (*Job CPU Time Limit Set – see page 57*) and 11 (*DD Dsname Set – see page 51*), also continuation of Exit 50 (*Message, Trace*)
- HEMDB401: Dynamic Allocation Exit IEFDB401 – function 11 (*DD Dsname Set – see page 51*)
- HEMUJI: SMF Exit IEFUJI – HEMDATA, functions 12 (*DD Duplicate Check – see page 53*) and 13 (*Job System Check – see page 55*)
- HEMUSI: SMF Exit IEFUSI – function 15 (*Step Region Set – see page 59*)
- HEMX031: JES2 Exit 31 – function 16 (*DD Line Limit Set – see page 62*)
- HEMUTL: SMF Exit IEFUTL – functions 17 (*Step CPU Time Ext. Set – see page 64*) and 18 (*Step Wait Time Ext. Set – see page 70*)
- HEMUSO: SMF Exit IEFUSO – function 19 (*DD Line Extension Set – see page 73*)



- HEMX048: JES2 Exit 48 – functions 20 (*DD Sysout Set – see page 75*), 21 (*DD Output Priority Set – see page 78*) and 22 (*DD Outdisp Set – see page 80*)
- HEMSSI8T: SSI 80 call – used in function 9 (*temporary fix HEMX050*)
- HEMSSI80: SSI 80 call – used in function 8 (*HEMX050*) and 13 (*HEMUJI*)
- VBS2VB: Utility to reformat VBS to VB (*SMF Records – see page 19*)
- HEMRFRSH: Exit Refresh JES2/SMF/TRC see HEMRFRSH – Refresh on page 103
- HEMCKMOD: Utility to check the different releases of modules in Loadlib, PDSELIB and storage see HEMRFRSH – Refresh on page 103
- HEMCOLD: Delete HEMCB and Modules – use with caution! This will produce a cold start of HEM! see HEMCOLD – clear HEM storage on page 112

#### 4.1.4 LPALIB

The following members must be in the LPA when JES2 is started:

- HEMX031
- HEMX048
- HEMX050

This can be done by copying the members from the Loadlib (*see LOADLIB on page 87*) to an PLPA dataset

or

by placing the members in the MLPA – IEALPAxx Parmlib member:

```
INCLUDE LIBRARY(hlq.HEM.LOADLIB) VOLUME(volser)
MODULES(HEMX031,
        HEMX048,
        HEMX050)
```

#### 4.1.5 LINKLST

The following members must be in the LINKLST when JES2 is started:

- HEMX006
- HEMX020

This can be done by copying the members from the Loadlib (*see LOADLIB on page 87*) to a LINKLST dataset

or

by defining the HEM Loadlib as part of the LINKLST – PROGxx Parmlib member:

```
LNKLST ADD NAME(lnklstname) DSN(hlq.HEM.LOADLIB) VOLUME(volser)
```

#### 4.1.6 APF

The HEM Loadlib must be defined as APF authorized.

This can be done dynamically using such a command

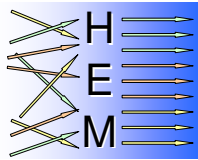
```
SETPROG APF,ADD,DSNAME=hlq.HEM.LOADLIB,VOLUME=volser
```

or

by defining the HEM Loadlib as part of the APF – PROGxx Parmlib member:

```
APF ADD DSNAME(hlq.HEM.LOADLIB) VOLUME(volser)
```

#### 4.1.7 REXX



The HEM REXX library can be a PDS or a PDSE – this dataset should be defined with the following characteristics:

- a. Organization . . . : PO
- b. Record format . . . : FB
- c. Record length . . . : 80
- d. Block size . . . . : system determined
- e. 1st extent tracks . : 30 (Minimum)
- f. Secondary tracks . : 30 (Minimum)

The REXX library will be delivered under SYS4M.HEM.CLIST and contains 8 Members:

- HEM: Main ISPF Application (*see HEM – ISPF on page 2*)
- HEMCOPY: Create Macro Copybooks
- HEMEDIT: Edit macro for options
- HEMEDOPT: Edit macro for options with Parm
- HEMPARM: Check and Compile Options
- HEMSMF: SMF Record Formatting
- HEMVIECK: View Macro HEMSRCE Check
- HEMVIEER: View Macro HEMPARM Errors

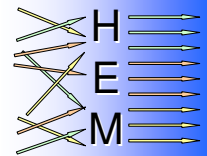
#### 4.1.8 Panels

The HEM Panels library can be a PDS or a PDSE – this dataset should be defined with the following characteristics:

- g. Organization . . . . : PO
- h. Record format . . . . : FB
- i. Record length . . . . : 80
- j. Block size . . . . . : system determined
- k. 1st extent tracks . : 30 (Minimum)
- l. Secondary tracks . : 30 (Minimum)

The Panels library will be delivered under SYS4M.HEM.PANELS and contains 36 Members:

- HEMBAR: Display bar of progress
- HEMBASE: Base definition (*see Base Options – B on page 3*)
- HEMINFO: Change Information (*see Display Change Information – I on page 18*)
- HEMMEMB: Member Defaults (*see Member Defaults – M on page 7*)
- HEMOPTS: Function Options (*see Exit/Function Options – O on page 10*)
- HEMPRIM: Primary Panel (*see HEM – ISPF on page 2*)
- HEMSMFP: SMF Display (*see Display SMF Records – S on page 19*)
- HEMHELP: HEM Help
- HEMHBASE, HEMHINFO, HEMHPRIM, HEMHOPTS, HEMHSMFP, HEMHFN01-HEMFN23: Help Panel Help



## 4.2 HEM Started Task

HEM needs a started task to be started on every MVS image. No function will be active if the started task has not been once started!

After the first start of the HEM started task, the functions will be active until:

- HEMCOLD utility has been used
- the function has been set inactive in the HEM ISPF application
- the exit has been disabled.

Only one started task can be started on every image. HEM will recognize an already running HEM started task – the second started task will abort with a HEM00302E message.

### 4.2.1 Started Task JCL

The following JCL should be used:

```
//HEMSTC      PROC
//*-----
//* HEM - HOST EXIT MANAGER
//* COPYRIGHT YCOS YVES COLLIARD SOFTWARE GMBH - 2006-08
//*-----
//* SMF RECORD NUMBER FOR RECORDING - 200-255
//*-----
//STEPHEM    EXEC PGM=HEMSTC,PARM='238'
//STEPLIB   DD DISP=SHR,DSN=&HLQ...HEM.LOADLIB
//PDSELIB   DD DISP=SHR,DSN=&HLQ...HEM.PDSELIB
//SYSABEND  DD SYSOUT=*
//*-----
```

The &HLQ. variable should set or changed to the required value.

The record number for SMF recording must be defined and should be between 200 and 255.

### 4.2.2 Started Task activities

The following are performed during the initialization of the HEM started task. Messages generated to confirm the success or failure of the actions are shown:

1. Check the parameter – SMF record number
  - a. required – between 200 and 255

```
HEM00300E PARAMETER ERROR
User Abend 1111 (No dump)
```

```
HEM00001I STARTING HEM v.r.m-PTFxxxxx WITH SMF RECORD xxx
```

2. Check if the started task is already active on this system

```
HEM00302E STC ALREADY ACTIVE IN SYSTEM
User Abend 1113 (No dump)
```

3. Check if the HEM CSA control block is already getmained  
if not – first start – then execute the following steps

- a. Obtain CSA storage subpool 241

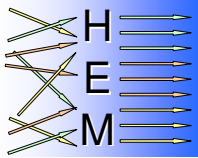
```
HEM00303E CSA STORAGE OBTAIN ERROR
User Abend 1114
```

- b. Create name token (*persistent*) – CSA getmained

```
HEM00304E NTC CREATE CBS ERROR
User Abend 1115
```







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- c. load the following members from the PDSELIB to the LPA  
HEMMAIN, HEMTRACE, HEMFN01A to HEMFN23A  
save HEMFN01A to HEMFN23A entry points in HEM CSA CB

```
HEM00306E DYN ALL LPA ERROR  
User Abend 1117
```

```
HEM00002I ALL FILTER FUNCTIONS LOADED IN LPA
```

- d. save HEMMAIN and HEMTRACE entry points in HEM CSA CB
- e. load HEMCURR and initialize time stamps of filter in HEM CSA CB

```
HEM00003I ALL FILTER FUNCTIONS INITIALIZED  
HEM00004I CSA CONTROL BLOCK AT xxxxxxxx CREATED|REUSED
```

4. Create a Name Token (*not persistent*): HEMSTC active

```
HEM00305E NTC CREATE STC ERROR  
User Abend 1116
```

5. Link HEMSSI – create/reuse HEMS subsystem

- a. Look into the SSCVT for a HEMS subsystem  
if not already active

- i. Create the subsystem HEMS

```
HEM00320E SSI ADD ERROR  
User Abend 1121
```

```
HEM00007I SUBSYSTEM HEMS ADDED
```

- ii. Enable commands

```
HEM00321E SSI OPTIONS ERROR  
User Abend 1122
```

```
HEM00008I SUBSYSTEM HEMS COMMANDS ENABLED
```

- b. If SSVT is not already created – Initialize SSVT

- i. Check if subsystem routine – HEMSFR – is already in the LPA  
if not already in the LPA – load it to the LPA from PDSELIB

```
HEM00323E DYNAMIC LPA ADD OF HEMSFR ERROR  
User Abend 1124
```

```
HEM00009I SUBSYSTEM HEMS HEMSFR LOADED IN LPA: xxxxxxxx
```

- ii. Initialize SSVT

```
HEM00313E SSVT CREATE ERROR  
User Abend 1120
```

```
HEM00010I SUBSYSTEM HEMS INITIALIZED
```

- iii. Activate subsystem

```
HEM00322E SSI ACTIVATE ERROR  
User Abend 1123
```

```
HEM00011I SUBSYSTEM HEMS ACTIVATED
```

- c. If SSVT already created – Use current SSVT

```
HEM00012I SUBSYSTEM HEMS ALREADY ACTIVE
```

6. Create HEMSTCCM subtask – command interface

- a. Initialize communication and wait for command
- b. React on STOP (P) hemstc, F hemstc,P or F hemstc,STOP

```
HEM00103I INVALID MODIFY COMMAND
```

```
HEM00102I STOP COMMAND ACCEPTED
```

```
HEM00100I INITIALIZATION COMPLETE
```

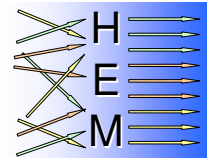
7. Wait for 10 seconds or HEMSTCCM to end (Stop)

- a. Stop HEM

```
HEM00103I STOP COMPLETE
```



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- b. Time expired – Load HEMCURR and Check HEMFUNxx Time Stamp
  - i. Get global options
  - ii. Delete old LPA module – if necessary

```
HEM00308E DYN DEL LPA ERROR
User Abend 1119
```

```
HEM00005I FILTER FUNCTION xx DELETED FROM LPA AT xxxxxxxxx
```

- iii. Load new LPA module – if necessary

```
HEM00307E DYN ONE LPA ERROR
User Abend 1118
```

```
HEM00006I useridx FILTER xx ADDED IN LPA AT xxxxxxxxx
```

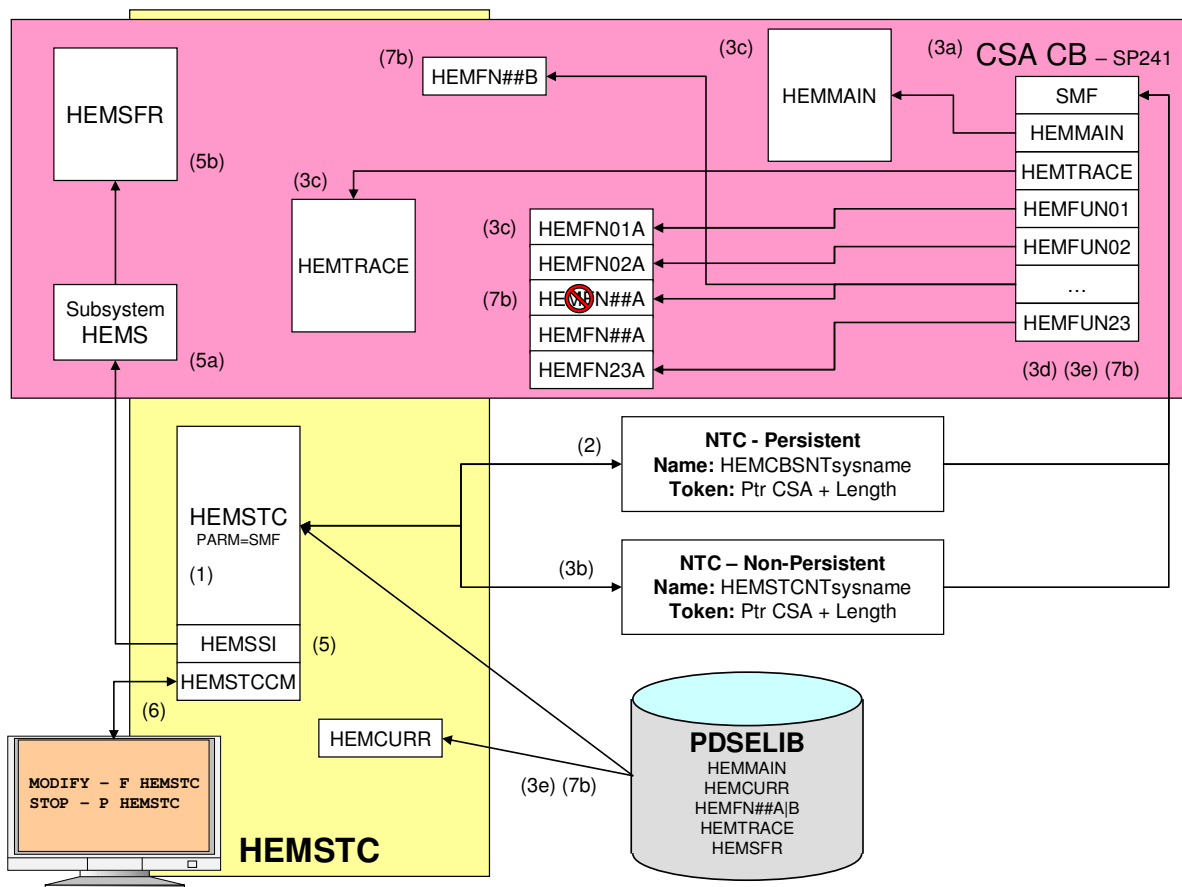
## HEMSTC general messages:

```
HEM00301E MODESET ERROR
User Abend 1112 (No dump)
```

```
HEM00309E SMF WRITE RECORD ERROR RC=xxxxxxxx
```

## HEMSSI general messages:

```
HEM00317E SMF WRITE RECORD ERROR RC=xxxxxxxx
```



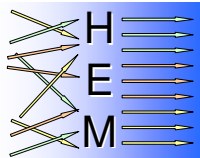


Figure 24: HEM – Started Task

## 4.2.3 Started Task commands

The following commands can be used to stop HEM:

```
P hemstc
```

```
F hemstc,STOP
```

```
F hemstc,P
```

## 4.2.4 Started Task standard messages

Here is an example of the HEM started task messages at first start (*cold*):

```
HEM00001I STARTING HEM 1.0.2-PTF00000 WITH SMF RECORD 238
HEM00002I ALL FILTER FUNCTIONS LOADED IN LPA
HEM00003I ALL FILTER FUNCTIONS INITIALIZED
HEM00004I CSA CONTROL BLOCK AT 06AF58E8 CREATED
HEM00007I SUBSYSTEM HEMS ADDED
HEM00008I SUBSYSTEM HEMS COMMANDS ENABLED
HEM00009I SUBSYSTEM HEMS HEMSFR LOADED IN LPA: 86EA9000
HEM00010I SUBSYSTEM HEMS INITIALIZED
HEM00011I SUBSYSTEM HEMS ACTIVATED
HEM00100I INITIALIZATION COMPLETE
```

HEM0001I – HEM is starting

HEM00002I – all filter functions have been loaded in LPA

HEM00003I – initialization of filters is finished

HEM00004I – the CSA Control Block has been created

HEM00007I – the HEMS subsystem has been added

HEM00008I – the subsystem has been enabled for commands

HEM00009I – subsystem functional routine has been loaded to LPA

HEM00010I – subsystem is initialized

HEM00011I – subsystem is active

HEM00100I – HEM is active

Here is an example of the HEM started task messages on any other start (*warm*):

```
HEM00001I STARTING HEM 1.0.2-PTF00000 WITH SMF RECORD 238
HEM00004I CSA CONTROL BLOCK AT 06AF58E8 REUSED
HEM00012I SUBSYSTEM HEMS ALREADY ACTIVE
HEM00100I INITIALIZATION COMPLETE
```

HEM0001I – HEM is starting

HEM00004I – the CSA Control Block has been reused

HEM00012I – subsystem is already active

HEM00100I – HEM is active

Here is an example of the HEM started task messages at shutdown:

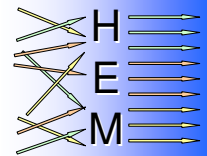
```
HEM00102I STOP COMMAND ACCEPTED
HEM00103I STOP COMPLETE
```

HEM00102I – HEM stop command was received

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HEM00103I – HEM stop function was done

Here is an example of the HEM started task messages during execution:

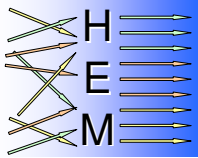
```
HEM00006I userid FILTER 01 ADDED IN LPA AT 06806000  
HEM00005I FILTER FUNCTION 01 DELETED FROM LPA AT 05E1B000
```

HEM00006I – Filter function xx was loaded after a translate was done by a user

HEM00005I – Filter function xx was deleted (*10 seconds after load*)

The HEM filter modules are created during the translate process (*see T – Translate on page 12*). During the start of the HEM started task the HEMFNxxA modules will be loaded. The translate process produces always a HEMFNxxA and a HEMFNxxB module. When the HEM started task checks for new translated filters (*every 10 seconds*), HEM will then load the HEMFNxxB in the LPA and later (*10 seconds*) it will delete the HEMFNxxA module from the LPA. At the next translation HEM will load the HEMFNxxA in the LPA and and later (*10 seconds*) it will delete the HEMFNxxB module from the LPA.





## 4.3 HEM Exits

The following functions are implemented in the following Exits

Function	Description	Exit
01	Jobname Check	Exit20, Exit50, Exit06
02	Job Account Code Set	Exit20, Exit50, Exit06
03	Job Account Codes Check	Exit20, Exit50, Exit06
04	Job Jobclass Set	Exit20, Exit50, Exit06
05	Job Jobclass Check	Exit20, Exit50, Exit06
06	Job Msgclass Set	Exit20, Exit50, Exit06
07	Job Programmer Name Set	Exit20, Exit50, Exit06
08	Job System Set	Exit20, Exit50, Exit06
09	Job Duplicate Check	Exit20, Exit50, Exit06
10	Job Input Priority Set	Exit20, Exit50, Exit06
11	DD Dsname Set	Exit06
12	DD Duplicate Check	IEFUJI
13	Job System Check	IEFUJI
14	Job CPU Time Limit Set	Exit06
15	Step Region Set	IEFUSI
16	DD Line Limit Set	Exit31
17	Step CPU Time Ext. Set	IEFUTL
18	Step Wait Time Ext. Set	IEFUTL
19	DD Line Extension Set	IEFUSO
20	DD Sysout Set	Exit48
21	DD Output Priority Set	Exit48
22	DD Outdisp Set	Exit48
23	Step Abend Set	SSI50

**Figure 25: Function – Exits**

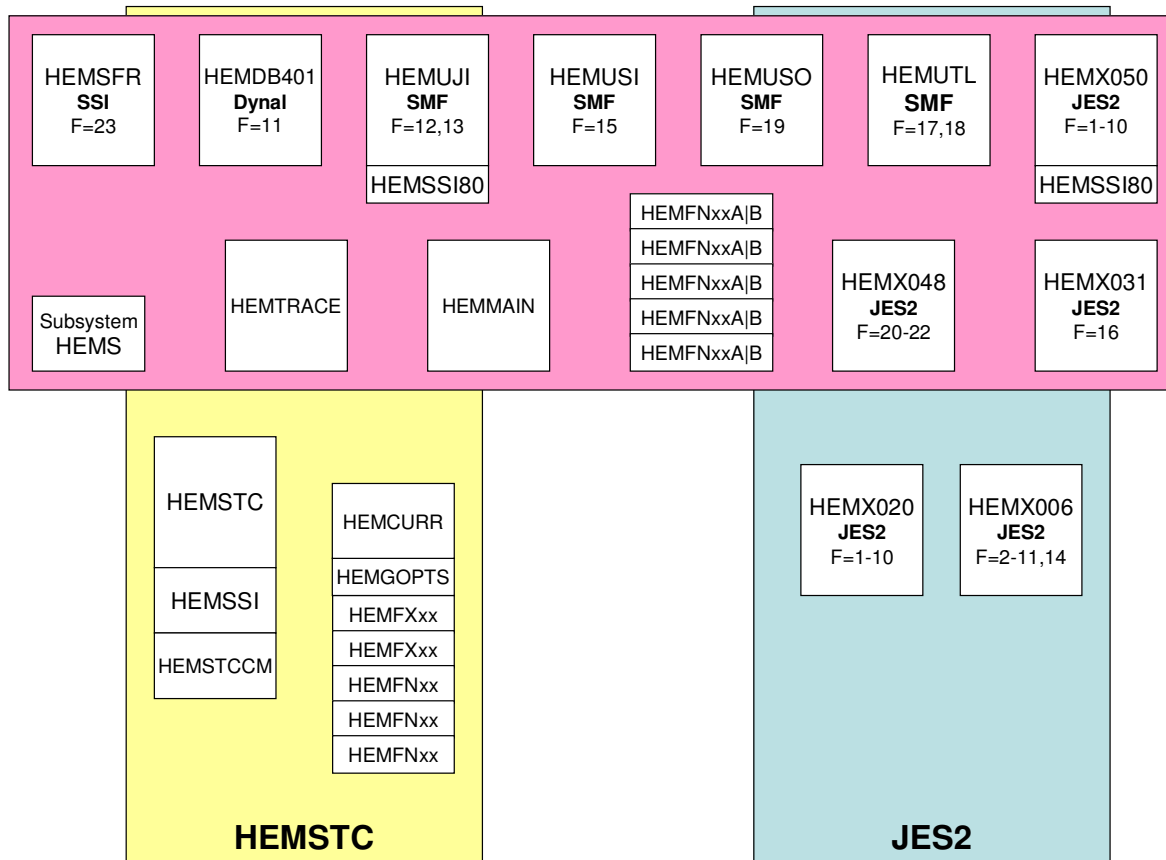
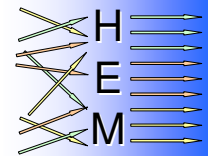


Figure 26: HEM – Functions and modules

### 4.3.1 JES2 Exits

The following definitions are needed to use the JES2 exits:

1. JES2 Parms – the exits are defined as well as the load modules:

```
LOADMOD (HEMX006) STORAGE=PVT
LOADMOD (HEMX020) STORAGE=PVT
LOADMOD (HEMX031) STORAGE=LPA
LOADMOD (HEMX048) STORAGE=LPA
LOADMOD (HEMX050) STORAGE=LPA

EXIT (006) ROUTINES=(EXIT006), STATUS=ENABLED
EXIT (020) ROUTINES=(EXIT020), STATUS=ENABLED
EXIT (031) ROUTINES=(EXIT031), STATUS=ENABLED
EXIT (048) ROUTINES=(EXIT048), STATUS=ENABLED
EXIT (050) ROUTINES=(EXIT050), STATUS=ENABLED
```

2. HEMX006 and HEMX020 exits can be dynamically activated using the following procedure:

- a. copy the new HEMX006 and/or HEMX020 module to the LINKLST
- b. refresh the LINKLST:

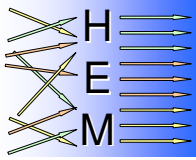
```
F LLA, REFRESH or UPDATE=xx
```

- c. refresh/reload the module in JES2:

```
$TLOADMOD (HEMX###), REFRESH
```

- d. refresh the Exit:





```
$TEXIT(###), REFRESH
```

- HEMX031, HEMX048 and HEMX050 exits can be dynamically activated using the utility HEMRFRSH – see HEMRFRSH – Refresh on page 103

### 4.3.2 SMF Exits

The following definitions are needed to use the SMF exits:

- SMF Params – the exits must be defined in the SMFPRMxx Parmlib member and the selected SMF record type must be included (see *Started Task JCL on page 91*):

```
SYS(TYPE(nnn, 238), EXITS(IEFUJI, IEFUSO, IEFUTL, IEFUSI, ...), ...)
```

- Dynamic exits – the exits must be defined within PROGxx Parmlib member:

```
EXIT ADD EXITNAME(SYS.IEFUJI) MODNAME(HEMUJI) DSN(hlq.HEM.LOADLIB)
EXIT ADD EXITNAME(SYS.IEFUSI) MODNAME(HEMUSI) DSN(hlq.HEM.LOADLIB)
EXIT ADD EXITNAME(SYS.IEFUSO) MODNAME(HEMUSO) DSN(hlq.HEM.LOADLIB)
EXIT ADD EXITNAME(SYS.IEFUTL) MODNAME(HEMUTL) DSN(hlq.HEM.LOADLIB)
```

or this can also be done dynamically:

```
SETPROG EXIT, ADD, EXITNAME=SYS.IEFUJI, MODNAME=HEMUJI, DSN=hlq.HEM.LOADLIB
SETPROG EXIT, ADD, EXITNAME=SYS.IEFUSI, MODNAME=HEMUSI, DSN=hlq.HEM.LOADLIB
SETPROG EXIT, ADD, EXITNAME=SYS.IEFUSO, MODNAME=HEMUSO, DSN=hlq.HEM.LOADLIB
SETPROG EXIT, ADD, EXITNAME=SYS.IEFUTL, MODNAME=HEMUTL, DSN=hlq.HEM.LOADLIB
```

- HEMUJI, HEMUSI, HEMUSO and HEMUTL exits can be dynamically activated using the utility HEMRFRSH – see HEMRFRSH – Refresh on page 103

### 4.3.3 Dynamic Allocation Exit

The following definition is needed to use the dynamic allocation exits:

- Dynamic exit – the exit must be defined within PROGxx Parmlib member:

```
EXIT ADD EXITNAME(IEFDB401) MODNAME(HEMDB401) DSN(hlq.HEM.LOADLIB)
```

or this can also be done dynamically:

```
SETPROG EXIT, ADD, EXITNAME=IEFDB401, MODNAME=HEMDB401, DSN=hlq.HEM.LOADLIB
```

- HEMDB401 exit can be dynamically activated using the utility HEMRFRSH – see HEMRFRSH – Refresh on page 103

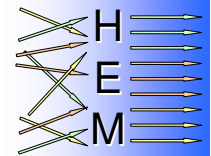
### 4.3.4 Exit disablement

The following commands can be used to disable the HEM exits and stop the related functions – use it with caution!

Command	Exit and Type	Functions
\$TEXIT(20), STATUS=DISABLED \$TEXIT(50), STATUS=DISABLED	Exit020 JES2	1 to 10
\$TEXIT(6), STATUS=DISABLED	Exit006 JES2	11 and 14 msg 1 to 10
SETPROG EXIT, DELETE, EXITNAME=IEFDB401, MODNAME=HEMDB401	IEFDB401 Dyn Alloc	11
SETPROG EXIT, DELETE, EXITNAME=SYS.IEFUJI, MODNAME=HEMUJI	IEFUJI SMF	12 and 13 15 to 23
SETPROG EXIT, DELETE, EXITNAME=SYS.IEFUSI, MODNAME=HEMUSI	IEFUSI SMF	15

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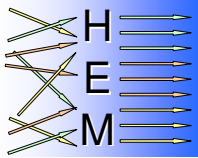
SETPROG EXIT,DELETE,EXITNAME=SYS.IEFUSO,MODNAME=HEMUSO	IEFUSO SMF	16
SETPROG EXIT,DELETE,EXITNAME=SYS.IEFUTL,MODNAME=HEMUTL	IEFUTL SMF	17 and 18
\$TEXIT(31),STATUS=DISABLED	Exit031 JES2	19
\$TEXIT(48),STATUS=DISABLED	Exit048 JES2	20-22
SETSSI DEACTIVATE,S=HEMS	SSI 50	23

**ATTENTION:** Disabling JES2 exit 6 will also suppress all messages of functions 1 to 10

**ATTENTION:** Disabling SMF exit IEFUJI will also stop functions 15 to 23!







## 4.4 HEM Utilities

### 4.4.1 HEMRFRSH – Refresh

The HEMRFRSH utility can be used to dynamically refresh the following HEM modules:

1. JES2 exits: HEMX031, HEMX048 and HEMX050 exits
2. SMF exits HEMUJI, HEMUSI, HEMUSO and HEMUTL exits
3. Dynamic allocation exit HEMDB401 exit
4. HEMTRACE
5. HEMSFR
6. HEMMAIN

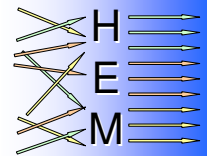
To run the utility HEMRFRSH use the following JCL:

```
/*-----  
/* HEM - HOST EXIT MANAGER - REFRESH UTILITY  
/* COPYRIGHT YCOS YVES COLLIARD SOFTWARE GMBH - 2006-08  
/*-----  
/* SET HEMSYS=SYS4      HLQ OF SYSTEM LIBRARIES  
/* SET HEMPLX=SYST     HLQ OF SYSPLEX LIBRARIES  
/* HEM EXCHANGE THE EXIT/MODULE  
/*      JES2  PARM= 031 048 050  
/*      SMF   PARM= UJI USI USO UTL  
/*      DYNAL PARM= 401  
/*      TRACE PARM= TRC  
/*      SFR   PARM= S50  
/*      MAIN  PARM= MAI  
/*      OPTIONAL SECOND PARM - SMF RECORD NUMBER DEFAULT 238  
/*      PARM='TRC,211'  
//STEP1      EXEC PGM=HEMRFRSH, PARM='UTL'  
//STEPLIB   DD DISP=SHR, DSN=&HEMSYS..HEM.LOADLIB  
//HEMLOAD   DD DISP=SHR, DSN=&HEMSYS..HEM.LOADLIB  
//HEMPDSE   DD DISP=SHR, DSN=&HEMPLX..HEM.PDSELIB  
//SYSABEND  DD SYSOUT=*
```

1. DD Statements:
  - a. STEPLIB: only needed if HEM Loadlib is not part of LINKLST
  - b. HEMLOAD: required – must point to HEM loadlib
  - c. PDSELIB: required – must point to HEM PDSELIB
2. Parameter 1 required – which exit/module should be refreshed:
  - a. JES2
    - i. PARM=031 – HEMX031
    - ii. PARM=048 – HEMX048
    - iii. PARM=050 – HEMX050
  - b. SMF
    - i. PARM=UJI – HEMUJI
    - ii. PARM=USI – HEMUSI
    - iii. PARM=USO – HEMUSO
    - iv. PARM=UTL – HEMUTL
  - c. Dynamic allocation
    - i. PARM=401 – HEMDB401
  - d. Trace
    - i. PARM=TRC – HEMTRACE

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- e. Subsystem Interface Function Routine (*Function 23*)
  - i. PARM=S50 – HEMSFR
- f. Main HEM Filter Module
  - i. PARM=MAI – HEMMAIN
- 3. Parameter 2 optional – which SMF record number should be written:
  - a. Default SMF record 238
  - b. PARM='TRC,211' – use record 211
- 4. JCL SET statements
  - a. HEMSYS – high level qualifier of HEM Loadlib
  - b. HEMPLEX – high level qualifier of HEM PDSELIB

The following messages are produced by HEMRFRSH:

### 1. HEMRFRSH JES2 exit replace normal messages:

```
HEMRF099I JES2 SSCT=00C49578
HEMRF099I JES2 HCCT=00C29688
HEMRF099I JES2 XITA=06B2C238
HEMRF099I BASE XIT =06B2C3AC
HEMRF099I BASE XRT =06BBC3D0
HEMRF099I CURR RTN =05CF3430
```

Internal information about the routine within the JES2 address space

```
HEMRF009I LOAD HEM.... SUCCESSFUL AT xxxxxxxxx
```

HEMX031, HEMX048 or HEMX050 loaded in LPA

```
HEMRF011I JES2 XRT SET TO xxxxxxxxx
```

Internal information about the replacement of the exit within JES2 address space

```
HEMRF012I HEM.... LPA NOT DELETED - NOT DYNAMIC
```

HEM will not delete the JES2 exit from the LPA if it is not already part of the dynamic LPA

```
HEMRF013I HEM.... LPA DELETE SUCCESSFUL
```

HEM has deleted the old JES2 exit from the dynamic LPA

### 2. HEMRFRSH SMF exit replace normal messages:

```
HEMRF010I HEM.... EXIT DELETE AND ADD
```

HEM has deleted the old SMF exit and activated the new one

### 3. HEMRFRSH HEMTRACE replace normal messages:

```
HEMRF019I LOAD HEMTRACE SUCCESSFUL AT xxxxxxxxx
```

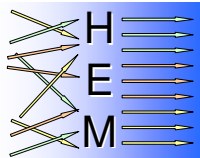
HEM has loaded the new HEMTRACE module

```
HEMRF020I HEMTRACE NOT DELETED - NOT FOUND
```

HEM will not delete the HEMTRACE from the LPA if it is not already part of the dynamic LPA

```
HEMRF021I DELETE HEMTRACE SUCCESSFUL
```





HEM has deleted the old HEMTRACE exit from the dynamic LPA

#### 4. HEMRFRSH HEMSFR replace normal messages:

```
HEMRF019I LOAD HEMSFR SUCCESSFUL AT xxxxxxxx
```

HEM has loaded the new HEMSFR module

```
HEMRF029I SUBSYSTEM HEMS EXCHANGED
```

HEM has exchanged the HEMSFR modules

```
HEMRF020I HEMSFR NOT DELETED - NOT FOUND
```

HEM will not delete the HEMSFR from the LPA if it is not already part of the dynamic LPA

#### 5. HEMRFRSH HEMMAIN replace normal messages:

```
HEMRF019I LOAD HEMMAIN SUCCESSFUL AT xxxxxxxx
```

HEM has loaded the new HEMMAIN module

```
HEMRF020I HEMMAIN NOT DELETED - NOT FOUND
```

HEM will not delete the HEMMAIN from the LPA if it is not already part of the dynamic LPA

```
HEMRF021I DELETE HEMMAIN SUCCESSFUL
```

HEM has deleted the old HEMMAIN exit from the dynamic LPA

#### 6. HEMRFRSH general normal messages:

```
HEMRF014I SUCESFUL REFRESH modulenm-v.r.m-PTFxxxxx-yyyymmdd-hh.mm
```

HEM has successfully refreshed the module – information about the module

#### 7. HEMRFRSH general abnormal messages:

```
HEMRF001E PARAMETER ERROR  
User Abend 1101 Nodump
```

Check the PARM on the EXEC statement

```
HEMRF007E DYNLPA ADD ONE LPA ERROR  
User Abend 1107
```

Internal error: please call support

```
HEMRF008E DYNLPA DEL ONE LPA ERROR  
User Abend 1108
```

Internal error: please call support

```
HEMRF022E SMF WRITE RECORD ERROR RC=xxxxxxx
```

Internal error: problem during writing SMF. See Typical SMF error codes on page 83

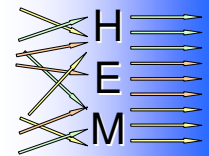
```
HEMRF006E MODESET ERROR  
User Abend 1106 Nodump
```

Internal error: check that STEPLIB is APF authorized



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HEMRF023E OPEN HEMPDSE ERROR  
User Abend 1123 Nodump

Check the JCL for HEMPDSE DD statement

HEMRF024E OPEN HEMLOAD ERROR  
User Abend 1124 Nodump

Check the JCL for HEMLOAD DD statement

HEMRF025E MODULE NOT FOUND IN DATASET - LOAD ERROR  
User Abend 1125 Nodump

Check HEMLOAD DD dataset for the necessary module

### 8. HEMRFRSH JES2 exit abnormal messages:

HEMRF002E NO JES2 SUBSYSTEM FOUND  
User Abend 1102 Nodump

Internal error: please call support

HEMRF003E NO HCCT CB FOUND  
User Abend 1103 Nodump

Internal error: please call support

HEMRF004E BASE XIT NO SET - ERROR  
User Abend 1104 Nodump

Internal error: Check if HEMSTC is active

HEMRF005E BASE XIT MUST BE ENABLED - ERROR  
User Abend 1105 Nodump

Internal error: please call support

### 9. HEMRFRSH SMF exit abnormal messages:

HEMRF026E DYN MODIFY STATE EXIT ERROR  
User Abend 1126

Internal error: please call support

HEMRF015E DYN DEL EXIT ERROR  
User Abend 1115

Internal error: please call support

HEMRF016E DYN ADD EXIT ERROR - ATTENTION DELETE DONE!  
User Abend 1116

Internal error: please call support

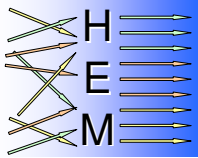
**ATTENTION:** HEM has already deleted the SMF exit from this system – all functions from this exit are disabled!

HEMRF017E SMF EXIT REPLACE DATASET HEMLOAD MISSING  
User Abend 1117 Nodump

Check the JCL for HEMLOAD DD statement

### 10. HEMRFRSH HEMTRACE and HEMMAIN abnormal messages:





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```
HEMRF018E HEM NOT ALREADY STARTED
User Abend 1118 Nodump
```

Check HEM started task running

## 11. HEMRFRSH HEMSFR abnormal messages:

```
HEMRF019E SUBSYSTEM HEMS NOT ALREADY DEFINED
User Abend 1119 Nodump
```

Check HEM started task running

```
HEMRF027E SUBSYSTEM HEMS NOT INITIALIZED
User Abend 1127 Nodump
```

Internal error: please call support

```
HEMRF028E SUBSYSTEM HEMS EXCHANGE SSVT ERROR
User Abend 1128 Dump
```

Internal error: please call support

### 4.4.2 HEMCKMOD – Check modules

The HEMCKMOD utility can be used to verify that the different locations where HEM modules can be found have the same releases. HEMCKMOD will do the following checks – compare the modules at the following places:

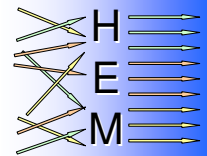
	Loadlib	Pdselib	Linklib	Lpalib	Storage
HEMX006	X		X		X
HEMX020	X		X		X
HEMX031	X			X	X
HEMX048	X			X	X
HEMX050	X			X	X
HEMUJI	X				X
HEMUSI	X				X
HEMUTL	X				X
HEMUSO	X				X
HEMDB401	X				X
HEMCKMOD	X				X
HEMSTC	X				
HEMSTCCM	X				
HEMRFRSH	X				
HEMSSI	X				
HEMSSI80	X				
HEMROPTS		X			
HEMRFX		X			
HEMTRACE		X			X
HEMSFR		X			X
HEMMAIN		X			X

Figure 27: HEMCKMOD – Checks



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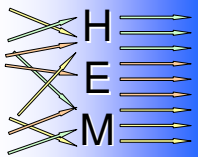
The following JCL should be used to run the HEMCKMOD utility:

```

/*-----
/* * HEM - HOST EXIT MANAGER - MODULE CHECK UTILITY
/* * COPYRIGHT YCOS YVES COLLIARD SOFTWARE GMBH - 2006-08
/*-----
// SET HEMSYS=YVES          SET HLQ OF LOADLIB
// SET HEMPLX=YVES          SET HLQ OF PDSELIB
// SET LNK=SYS1.LINKLIB     SET NAME OF LINKLIB
// SET LPA=SYS1.LPALIB     SET NAME OF LPALIB
/*-----
/* * COPY THE NEEDED MODULES - TO TEMP PDS AND RENAME
/*-----
//STEPCOPY EXEC PGM=IEBCOPY,REGION=0M
//SYSPRINT DD  SYSOUT=A
//HEMLOAD  DD  DISP=SHR,DSN=&HEMSYS..HEM.LOADLIB
//HEMPDSE  DD  DISP=SHR,DSN=&HEMPLX..HEM.PDSELIB
//HEMLINK  DD  DISP=SHR,DSN=SYS1.LINKLIB
//HEMLPA   DD  DISP=SHR,DSN=SYS1.LPALIB
//XEMLOAD  DD  DSNNAME=&XEMLOAD,DSNTYPE=PDS,
//          DISP=(,PASS),SPACE=(CYL,(5,5,40),RLSE)
//XEMPDSE  DD  DSNNAME=&XEMPDSE,DSNTYPE=PDS,
//          DISP=(,PASS),SPACE=(CYL,(5,5,40),RLSE)
//XEMLINK  DD  DSNNAME=&XEMLINK,DSNTYPE=PDS,
//          DISP=(,PASS),SPACE=(CYL,(5,5,40),RLSE)
//XEMLPA   DD  DSNNAME=&XEMLPA,DSNTYPE=PDS,
//          DISP=(,PASS),SPACE=(CYL,(5,5,40),RLSE)
//SYSIN    DD  *
        COPY      OUTDD=XEMLOAD,INDD=HEMLOAD
        SELECT    MEMBER=((HEMX006,XEMX006),
                        (HEMX020,XEMX020),
                        (HEMX031,XEMX031),
                        (HEMX048,XEMX048),
                        (HEMX050,XEMX050),
                        (HEMUJI,XEMUJI),
                        (HEMUSI,XEMUSI),
                        (HEMUTL,XEMUTL),
                        (HEMUSO,XEMUSO),
                        (HEMDB401,XEMDB401),
                        (HEMSTC,XEMSTC),
                        (HEMSTCCM,XEMSTCCM),
                        (HEMRFRSH,XEMRFRSH),
                        (HEMCKMOD,XEMCKMOD),
                        (HEMSSI,XEMSSI),
                        (HEMSSI80,XEMSSI80))
                                X
        COPY      OUTDD=XEMPDSE,INDD=HEMPDSE
        SELECT    MEMBER=((HEMTRACE,XEMTRACE),
                        (HEMMAIN,XEMMAIN),
                        (HEMRFX,XEMRFX),
                        (HEMROPTS,XEMROPTS),
                        (HEMSFR,XEMSFR))
                                X
        COPY      OUTDD=XEMLINK,INDD=HEMLINK
        SELECT    MEMBER=((HEMX006,XEMX006),
                        (HEMX020,XEMX020))
                                X
        COPY      OUTDD=XEMLPA,INDD=HEMLPA
        SELECT    MEMBER=((HEMX031,XEMX031),
                        (HEMX048,XEMX048),
                        (HEMX050,XEMX050))
                                X
/*-----
/* * CHECK MODULES
/* * - IF WTO ARE ALSO WANTED - CODE: PARM=W IN EXEC
/*-----
//STEPCK   EXEC PGM=HEMCKMOD,REGION=0M
/*STEPCK   EXEC PGM=HEMCKMOD,REGION=0M,PARM=W
//STEPLIB  DD  DISP=SHR,DSN=&HEMSYS..HEM.LOADLIB

```





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```
//HEMLOAD DD DISP=SHR,DSN=&XEMLOAD  
//HEMPDSE DD DISP=SHR,DSN=&XEMPDSE  
//HEMLINK DD DISP=SHR,DSN=&XEMLINK  
//HEMLPA DD DISP=SHR,DSN=&XEMLPA  
//HEMPRINT DD SYSOUT=*  
//*HEMPRINT DD DSN=YVES.HEM.CKMOD,DISP=(,CATLG),  
//* SPACE=(TRK,(15,15),RLSE),UNIT=3390  
//SYSUDUMP DD SYSOUT=*
```

## 1. SET Statements:

- a. HEMSYS = high level qualifier of HEM.LOADLIB
  - b. HEMPLX = high level qualifier of HEM.PDSELIB
  - c. LNK = name of the Library where the HEM linklib modules resides (*see LINKLST on page 89*)
  - d. LPA = name of the Library where the HEM lpa modules resides (*see LPALIB on page 88*)
2. the first step uses IEBCOPY to copy and rename the HEM modules from the original libraries to temporaries libraries
  3. the second step will do the checks. The results will be written to the HEMPRINT DD statement. If WTO messages (routecode 11) are also needed, the parameter 'W' must be coded.

The following messages are produced by HEMCKMOD:

## 1. HEMCKMOD was successful:

```
dd/mm/yy MODULE V.R.M PTF YYYMMDD HH.MM STORAGE ADDR TYPE
```

### Header

```
HEMCK001I modulenm-v.r.m-PTFxxxxx-yyyymmdd-hh.mm info
```

The comparison of module "modulenm" with version "v.r.m", PTF xxxxx and compile date "yyyymmdd" was successful. The "info" will inform about the checks done:

- LOAD\_LINK\_STOR: Loadlib, Linklib and Storage have been checked
- LOAD\_LPA\_STOR: Loadlib, Lpalib and Storage have been checked
- LOAD\_STOR: Loadlib and Storage have been checked
- PDSE\_STOR: Pdselib and Storage have been checked
- LOAD: Loadlib version will be displayed
- PDSE: Pdselib version will be displayed

Storage Addr:

- JES= module address in JES
- EXT= module address in dynamic Exit
- LPA= module address in LPA

## 2. HEMCKMOD was not successful:

```
HEMCK100E HEMxxxxx COMPARE ERROR  
HEMCK200E info modulenm-v.r.m-PTFxxxxx-yyyymmdd-hh.mm
```

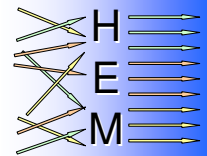
The comparison of module "HEMxxxxx-modulenm" with version "v.r.m", PTF xxxxx and compile date-time "yyyymmdd-hh.mm" was not successful. The "info" will inform about the place where this version and PTF was found – all places will be displayed:

- LOAD: Loadlib version
- PDSE: Pdselib version
- LINK: Linklib version



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- LPA: Lpalib version
- STOR: Stroage version

### 3. HEMCKMOD abnormal errors:

```
HEMCK002E NO JES2 SUBSYSTEM FOUND
HEMCK003E NO HCCT CB FOUND
HEMCK006E MODESET ERROR
HEMCK023E OPEN HEMPDSE ERROR
HEMCK024E OPEN HEMLOAD ERROR
HEMCK025E OPEN HEMLINK ERROR
HEMCK026E OPEN HEMLPA ERROR
HEMCK027E OPEN HEMPRINT ERROR
```

- HEMCK002E and HEMCK003E: please call HEM support
- HEMCK006E: Internal error: check that STEPLIB is APF authorized
- HEMCK023E, HEMCK024E, HEMCK025E, HEMCK026E, HEMCK027E: check the first step and the DD statements

### Typical HEMCKMOD messages:

#### 1. typical successful messages:

```
07/06/08  MODULE  V.R.M PTF          YYYYMMDD HH.MM  STORAGE ADDR  TYPE
HEMCK001I HEMCKMOD-1.8.0-PTF00000-20080607-19.55          LOAD_STOR
HEMCK001I HEMX006 -1.8.0-PTF00000-20080604-19.22  JES=122C8588  LOAD_LINK_STOR
HEMCK001I HEMX020 -1.8.0-PTF00000-20080604-19.25  JES=11D7A230  LOAD_LINK_STOR
HEMCK001I HEMX031 -1.8.0-PTF00000-20080604-19.28  JES=057D9F90  LOAD_LPA_STOR
HEMCK001I HEMX048 -1.8.0-PTF00000-20080604-19.30  JES=057D8BF8  LOAD_LPA_STOR
HEMCK001I HEMX050 -1.8.0-PTF00000-20080604-19.35  JES=057D7050  LOAD_LPA_STOR
HEMCK001I HEMUJI  -1.8.0-PTF00000-20080604-19.38  EXT=118672C8  LOAD_STOR
HEMCK001I HEMUSI  -1.8.0-PTF00000-20080604-19.38  EXT=118666B8  LOAD_STOR
HEMCK001I HEMUTL  -1.8.0-PTF00000-20080604-19.39  EXT=118655D0  LOAD_STOR
HEMCK001I HEMUSO  -1.8.0-PTF00000-20080604-19.40  EXT=1186C0B8  LOAD_STOR
HEMCK100E HEMDB401-1.8.0-PTF00000-20080607-19.28  EXT=1186A0B8  LOAD_STOR
HEMCK001I HEMSTC  -1.8.0-PTF00000-20080604-20.03          LOAD
HEMCK001I HEMSTCCM-1.8.0-PTF00000-20080604-19.43          LOAD
HEMCK001I HEMRFRSH-1.8.0-PTF00000-20080604-19.44          LOAD
HEMCK001I HEMSSI80-1.8.0-PTF00000-20080604-19.33          LOAD
HEMCK001I HEMSSI  -1.8.0-PTF00000-20080604-19.46          LOAD
HEMCK001I HEMTRACE-1.8.0-PTF00000-20080604-19.47  LPA=10442000  PDSE_STOR
HEMCK001I HEMSFR  -1.8.0-PTF00000-20080604-19.48  LPA=10429000  PDSE_STOR
HEMCK001I HEMMAIN -1.8.0-PTF00000-20080604-19.48  LPA=11316000  PDSE_STOR
HEMCK001I HEMREFX  -1.8.0-PTF00000-20080604-19.54          PDSE
HEMCK001I HEMROPTS-1.8.0-PTF00000-20080604-22.27          PDSE
```

#### 2. error – module HEMX006 was not found in Linklib:

```
HEMCK100E HEMX006  COMPARE ERROR
HEMCK200E LOAD HEMX006 -1.0.3-PTF00000-20070305-16.22
HEMCK200E LINK modulennm-v.r.m-PTFxxxxx-yyyyymmdd-hh.mm
HEMCK200E STOR HEMX006 -1.0.3-PTF00000-20070305-16.22
```

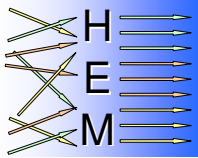
#### 3. error – module HEMX048 have an older version in loadlib:

```
HEMCK100E HEMX048  COMPARE ERROR
HEMCK200E LOAD HEMX048 -1.0.6-PTF00000-20070320-23.11
HEMCK200E LPA  HEMX048 -1.0.7-PTF00000-20070402-09.55
HEMCK200E STOR HEMX048 -1.0.7-PTF00000-20070402-09.55
```

### 4.4.3 HEMCOLD – clear HEM storage and stop HEM functions







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The HEMCOLD utility can be used to clear storage and force the next start of HEM to be a cold start.

The HEMCOLD utility will also stop all HEM functions!

HEMCOLD does the following:

1. Check HEMSTC still running
2. Read HEMCBSNT+sysname name token
3. Delete HEMCBSNT+sysname name token
4. Wait 10 seconds
5. Release CSA storage
6. Delete HEMTRACE and HEMMAIN from dynamic LPA
7. Delete HEMFN01A-HENFN23A from dynamic LPA
8. Delete HEMFN01B-HENFN23B from dynamic LPA.

The following messages are produced by HEMCOLD:

1. HEMCOLD was successful:

```
HEMCO001I ALL FUNCTION COMPLETE - HEM COLD START REQ
```

All HEM functions are stopped, CSA has been freed and dynamic LPA program were deleted

2. HEMCOLD was not successful:

```
HEMCO006E HEM STARTED TASK SILL ACTIVE - STOP IT  
User Abend 1006 Nodump
```

HEM started task must be down

```
HEMCO002E HEM CONTROL BLOCK NOT FOUND  
User Abend 1002 Nodump
```

HEMCOLD has been executed before HEMSTC or has been executed twice

```
HEMCO003E HEM HEMCBSNT+SYSNAME NTC DELETE ERROR  
User Abend 1003 Dump
```

Internal error: please call support

```
HEMCO005E MODESET ERROR  
User Abend 1005 Nodump
```

Internal error: check that STEPLIB is APF authorized

```
HEMCO004E CSA STORAGE RELEASE ERROR  
User Abend 1004 Dump
```

Internal error: please call support

**ATTENTION:** At this time HEMCOLD does NOT delete the HEM subsystem!

To run the HEMCOLD utility use the the following JCL:

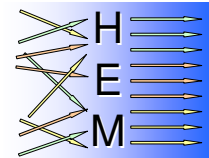
```
//HEMCOLDJ JOB  
//*-----  
//* HEM - HOST EXIT MANAGER - CLEAR STORAGE UTILITY  
//* COPYRIGHT YCOS YVES COLLIARD SOFTWARE GMBH - 2006-08  
//*-----
```



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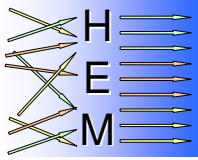
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---



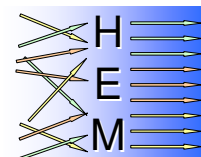
```
/* ATTENTION!!!!!!
/* DELETE CSA, NTC AND LPA !!!!!!!
/* ALL FUNCTIONS WILL BE STOPPED!!!!!!
/* ATTENTION!!!!!!
/* NEXT START OF HEM WILL BE A COLD START
/* NEVER USE IT DURING HEM STC ACTIVE!!!!!!
/*-----
//STEP COLD EXEC PGM=HEMCOLD
//STEPLIB DD DISP=SHR,DSN=&HEMHLQ..HEM.LOADLIB
//SYSABEND DD SYSOUT=*
```





## 5 HEM Tracing

HEM tracing helps the user to understand the filter and set options – if necessary every function can be traced on a job basis.



### 5.1 Trace setting

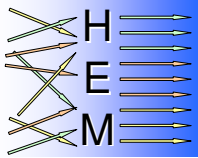
The HEM ISPF Options can be used to set the name of the address space to be traced. The name of the address space cannot be generic.

See Exit/Function Options – O on page 10

and

Tracing on page 17.





## 5.2 Trace messages

The following messages are produced by the trace function – the messages will be written to Joblog/Syslog:

### 1. HEMTRACE general messages:

```
HEMTR001I FUNCTION:xx INCLUDE FILTER:xxxxxxxxx MODE=mod MSG=m SMF=s dyst  
HEMTR001I FUNCTION:xx NO FILTER MATCH MODE=mod MSG=m SMF=s
```

Tracing for

- FUNCTION: xx – 01-23
- an INCLUDE filter has been found  
or  
NO FILTER MATCH
- Filter number (*INCLUDE*) – to check which filter corresponds: call the line command “C” – Check – on the HEM ISPF Options panel (*see Exit/Function Options – O on page 10 and C – Check on page 14*)
- Global function MODE, MSG and SMF setting
- dyst = DYNA for dynamic call (*HEMDB401*) or STAT for static call (*HEMX006*)

```
HEMTR002I LAST TRANSLATE dd/mm/yyyy hh:mm:ss.hh BY useridxx
```

Last translate of the function

```
HEMTR003I MODE=mod FAIL=f REPL=r ASKOP=a MSG=n SMF=n
```

If included: then information about the filter SET statement

```
HEMTR004I JOB=xxxxxxxxx USR=xxxxxxxxx GRP=xxxxxxxxx PGMR=xxxxxxxxxxxxxxxxxxxxxxxxx Yxxxxxxxxx  
SYSID=xxxxx CLS=x MSGCLS=x
```

General job information

```
HEMTR005I FORMS= ACCT(...)
```

General job information

```
HEMTR006I STEP=xxxxxxxxx PGM= DD= DSN=
```

Step and DD information – this information will not be produced for functions 1-10, 13 and 14 (*job oriented functions*)

```
HEMTR007I nnnn GROUPS=
```

General job information – number of connected groups and up to 10 group names

### 2. HEMTRACE function messages – these will be produced only for functions with changes – the new values will be shown:

```
HEMT0201I NEW ACCOUNTING ACT1= ACT2=  
HEMT0202I ACT3= ACT4= ACT5=
```

Function 02 – new accounting

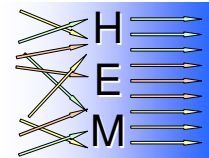
```
HEMT0401I NEW JOB CLASS=x
```

Function 04 – new job class



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```
HEMT0601I NEW MSGCLASS=x
```

Function 06 – new message class

```
HEMT0701I NEW PROGRAMMER NAME=xxxxxxxxxxxxxxxxxxxxxxxx
```

Function 07 – new programmer name

```
HEMT1001I NEW INPUT PRIORITY=xx
```

Function 10 – new JES2 input job priority

```
HEMT1101I NEWDSN= OLDDSN=
```

Function 11 – new and old dataset – Static

```
HEMT1201I NEWDSN= OLDDSN=
```

Function 11 – new and old dataset - Dynamic

```
HEMT1401I NEW TIME ( , )', ROUTCDE=2, DESC=5, MF=L
```

Function 14 – new job cpu time

```
HEMT1501I NEW REGION BELOW xxxxxxxxKB ABOVE xxxxxxxxKB -  
ACTUAL REGION xxxxxxxxKB',
```

Function 15 – new and actual region

```
HEMT1601I NEW LINE LIMIT=1234567
```

Function 16 – new line limit

```
HEMT1701I NEW CPU TIME EXTENTION=nnnnnn - ACTUAL CPU TIME=nnnnnn
```

Function 17 – step cpu time extension and actual step cpu time usage

```
HEMT1801I NEW WAIT TIME EXTENTION=nnnnnn - ACTUAL WAIT TIME=nnnnnn
```

Function 18 – step wait time extension and actual step wait time usage

```
HEMT1901I NEW LINE EXTENTION=nnnnnnnn
```

Function 19 – line count extension

```
HEMT2001I NEW CLASS=x FORMS=xxxxxxxx WRITER=xxxxxxxx HOLD=x DEST=dddddddddddddd  
HEMT2002I ACTUAL SYSOUT CLASS=x WRITER=xxxxxxxx DEST=dddddddddd UCS=xxxx FCB=xxxx  
HEMT2003I ACTUAL LRECL=xxxxx PAGES=999999999 LINES=999999999
```

Function 20 – new and actual Sysout characteristics

```
HEMT2101I NEW SYSOUT PRIORITY=xxx
```

Function 21 – new output priority

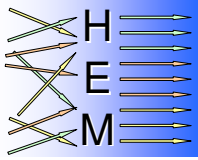
```
HEMT2201I NEW OUTPUT DISPOSITION xxxxx, xxxxx
```

Function 22 – new output disposition

```
HEMT2301I RETURN CODE=xxxx
```

Function 23 – step return code

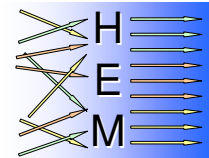




### 3. HEMTRACE general error messages:

HEMTR100E ERROR DURING RACROUTE CREATE
HEMTR100E ERROR DURING RACROUTE DELETE

Internal error: please call support



### 5.3 Trace example messages

The following are some example of HEMTRACE messages:

1. within function 06 filter 0001 match, message class changed from K to E:

```
HEMTR001I FUNCTION:06 INCLUDE FILTER:00000001 MODE=ACT MSG=I SMF=I
HEMTR002I LAST TRANSLATE 13/10/2006 07:37:17.83 BY YVES
HEMTR003I MODE=ACT FAIL=N REPL=N ASKOP=N MSG=I SMF=I
HEMTR004I JOB=HEMT0601 USR=YVES      GRP=SYS1      PGMR=                J0000123
SYSID=SYS1 CLS=A MSGCLS=K
HEMTR005I FORMS=STD          ACCT(MYAACT,123456)
HEMTR007I 0003 GROUPS=SYSMVIEW,SYS1      ,TIVOLI
HEMT0601I NEW MSGCLASS=E
HEM06001I HEMT0601 CHANGED FROM MSGCLASS(K) TO MSGCLASS(E) <YVES >
```

#### a. Function 06 – member definition

```
* MSGCLASS OF JOB HEMT0601 WILL BE SET TO E
SET MODE=ACT MSG=I MSGCLASS=E
INC JOB=HEMT0601

SET MODE=ACT MSG=I MSGCLASS=E
INC JOB=HEMT0602

SET MODE=SIM MSG=I MSGCLASS=E
INC JOB=HEMT0603

SET MODE=SIM MSG=I MSGCLASS=E
INC JOB=HEMTALLF
```

#### b. Function 06 – member check – option C

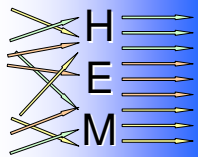
```
Last Translate: HEMFUN06 2006/10/13 07:37:17.83 YVES
** Test for 0001 "INC JOB=HEMT0601"
** Set for 0001 MSGCLASS E
** ----
** Test for 0002 "INC JOB=HEMT0602"
** Set for 0002 MSGCLASS E
** ----
** Test for 0003 "INC JOB=HEMT0603"
** Set for 0003 MSGCLASS E
** ----
** Test for 0004 "INC JOB=HEMTALLF"
** Set for 0004 MSGCLASS E
** ----
```

2. within function 20 filter 0003 matches on every DD statement, sysout class changed to Y and writer to NEWTR:

```
HEMTR001I FUNCTION:20 INCLUDE FILTER:00000003 MODE=ACT MSG=I SMF=I
HEMTR002I LAST TRANSLATE 22/03/2007 13:56:37.32 BY YVES
HEMTR003I MODE=ACT FAIL=N REPL=N ASKOP=N MSG=I SMF=I
HEMTR004I JOB=HEMX0001 USR=YVES      GRP=SYS1      PGMR=                J0000
HEMTR005I FORMS=STD          ACCT(YMACCT,123456)
HEMTR006I STEP=PRINT        PGM=IEBGENER DD=SYSPRINT
HEMTR007I 0003 GROUPS=SYSMVIEW,SYS1      ,TIVOLI
HEMT2001I NEW CLASS=Y FORMS=          WRITER=NEWWTR  HOLD=  DEST=
HEMT2002I ACTUAL SYSOUT CLASS=X WRITER=          DEST=LOCAL          UCS=****
HEMT2003I ACTUAL LRECL=00121 PAGES=001048576 LINES=000000004
HEM20001I HEMX0001 SYSPRINT CHANGED FROM SYSOUT(X) TO SYSOUT(Y) <YVES >
HEM20002I HEMX0001 SYSPRINT CHANGED FROM WRITER(          ) TO WRITER(NEWWTR          ) <Y
HEMTR001I FUNCTION:20 INCLUDE FILTER:00000003 MODE=ACT MSG=I SMF=I
HEMTR002I LAST TRANSLATE 22/03/2007 13:56:37.32 BY YVES
HEMTR003I MODE=ACT FAIL=N REPL=N ASKOP=N MSG=I SMF=I
```







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```
HEMTR004I JOB=HEMX0001 USR=YVES      GRP=SYS1      PGMR=                J0000
HEMTR005I FORMS=STD          ACCT(YMACCT,123456)
HEMTR006I STEP=PRINT        PGM=IEBGENER DD=SYSOUT
HEMTR007I 0003 GROUPS=SYSMVIEW,SYS1      ,TIVOLI
HEMT2001I NEW CLASS=Y FORMS=              WRITER=NEWWTR  HOLD=  DEST=
HEMT2002I ACTUAL SYSOUT CLASS=X WRITER=    DEST=LOCAL          UCS=****
HEMT2003I ACTUAL LRECL=00000 PAGES=001048576 LINES=000000000
HEM20001I HEMX0001 SYSOUT  CHANGED FROM SYSOUT(X) TO SYSOUT(Y) <YVES  >
HEM20002I HEMX0001 SYSOUT  CHANGED FROM WRITER(          ) TO WRITER(NEWWTR  ) <Y
HEMTR001I FUNCTION:20 INCLUDE FILTER:00000003 MODE=ACT MSG=I SMF=I
HEMTR002I LAST TRANSLATE 22/03/2007 13:56:37.32 BY YVES
HEMTR003I MODE=ACT FAIL=N REPL=N ASKOP=N MSG=I SMF=I
HEMTR004I JOB=HEMX0001 USR=YVES      GRP=SYS1      PGMR=                J0000
HEMTR005I FORMS=STD          ACCT(YMACCT,123456)
HEMTR006I STEP=PRINT        PGM=IEBGENER DD=SYSUT2
HEMTR007I 0003 GROUPS=SYSMVIEW,SYS1      ,TIVOLI
HEMT2001I NEW CLASS=Y FORMS=              WRITER=NEWWTR  HOLD=  DEST=
HEMT2002I ACTUAL SYSOUT CLASS=X WRITER=    DEST=LOCAL          UCS=****
HEMT2003I ACTUAL LRECL=00080 PAGES=001048576 LINES=000000001
HEM20001I HEMX0001 SYSUT2  CHANGED FROM SYSOUT(X) TO SYSOUT(Y) <YVES  >
HEM20002I HEMX0001 SYSUT2  CHANGED FROM WRITER(          ) TO WRITER(NEWWTR  ) <Y
```

## a. Function 20 – test JCL

```
//HEMX0001 JOB (YMACCT,123456),MSGCLASS=X
//* TEST TRACE
//PRINT EXEC PGM=IEBGENER
//SYSPRINT DD SYSOUT=*
//SYSOUT DD SYSOUT=*
//SYSIN DD DUMMY
//SYSUT1 DD *
DATA
//SYSUT2 DD SYSOUT=*
```

## b. Function 20 – member definition

```
* CHANGE OUTPUT OF JOB HEMTALLF DD YVESOUT SYSOUT NOT EQUAL Z TO
* NEW SYSOUT A
* NEW WRITER WRITER78
* NEW FORMS F9876
* NEW DESTINATION NDST
* NEW NOT HOLD
SET MODE=ACT SYSOUT=A WRITER=WRITER78 FORMS=F9876 DEST=NDST HOLD=NO
INC JOB=HEMTALLF DD=YVESOUT SYSOUT^=Z

SET MODE=ACT SYSOUT=A WRITER=12345678 FORMS=F9876 DEST=NDST HOLD=NO
JOB=HEMT2010 DD=SYSUT2

SET MODE=ACT SYSOUT=Y WRITER=NEWWTR
INC JOB=HEMX/
```

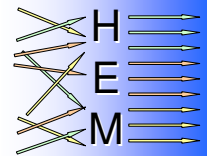
## c. Function 20 – member check – option C

```
Last Translate: HEMFUN20 2007/03/22 13:56:37.32 YVES
** Test for 0001 "INC JOB=HEMTALLF"
** Test for 0001 "and DD=YVESOUT"
** Test for 0001 "and SYSOUT^=Z"
** Set for 0001 SYSOUT A
** ----
** Set for 0001 WRITER WRITER78
** ----
** Set for 0001 FORMS F9876
** ----
** Set for 0001 HOLD NO
** ----
```



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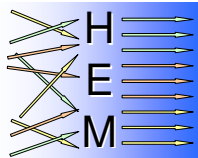


```
** Set for 0001 DEST NDST
** ----
** Test for 0002 "INC JOB=HEMT2010"
** Test for 0002 "and DD=SYSUT2"
** Set for 0002 SYSOUT A
** ----
** Set for 0002 WRITER 12345678
** ----
** Set for 0002 FORMS F9876
** ----
** Set for 0002 HOLD NO
** ----
** Set for 0002 DEST NDST
** ----
** Test for 0003 "INC JOB=HEMX/"
** Set for 0003 SYSOUT Y
** ----
** Set for 0003 WRITER NEWWTR
** ----
```

### 3. within function 01 where no filter found:

```
HEMTR001I FUNCTION:01 NO FILTER MATCH          MODE=ACT MSG=I SMF=I
HEMTR002I LAST TRANSLATE 22/03/2007 08:58:30.97 BY YVES
HEMTR004I JOB=HEMT0501 USR=YVES          GRP=SYS1          PGMR=          J0000123
SYSID=SYS1 CLS=4 MSGCLS=K
HEMTR005I FORMS=STD          ACCT(MYACCT,12345)
HEMTR007I 0003 GROUPS=SYSMVIEW,SYS1          ,TIVOLI
```





## 6 User's Guide changes

V1R9 – Level 0 – August 2008

- Update regarding version 1.9

V1R8 – Level 0 – June 2008

- Update regarding version 1.8
- Update HEMCKMOD: check HEMRFX and HEMROPTS, put date and address in report
- HEM ISPF: show last translate on Options

V1R0 – Level 4 – November 2007

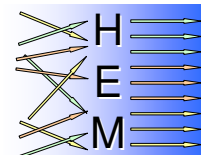
- Update for HEMMAIN refresh and check module support

V1R0 – Level 3 – July 2007

- Update for HEMDB401 support
- Update for HEMUSI new RESERVE keyword

V1R0 – Level 2 – Mai 2007

- HEM ISPF Help added
- HEMRFRSH utility: refresh of HEMSFR – function 23 – added
- Clarification of SMF “< \*\*NONE\*\* >” information
- Clarification of the order of function 14
- Clarification of messages of functions 1 to 10
- HEMCOLD utility added
- HEMSTCD utility renamed in HEMCOLD
- Function dependency to HEM started task removed
- RTS compatibility removed
- HEMSTCEX removed
- Exit disablement explanation added



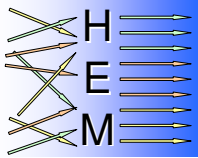
## 7 HEM changes

V1R9 – Level 0 – August 2008

- Upgrade product to z/OS 1.9
- Internal JES2 CB changes

V1R8 – Level 0 – June 2008

- Upgrade product to z/OS 1.8
- Enhancement of Option panel – display last translate
- Enhancements of HEMCKMOD
  - o display date/time, check HEMRFX and HEMROPTS and display in-storage address



## 8 HEM – HOST Exit Manager –Support

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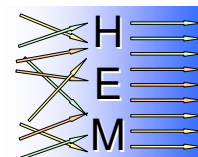
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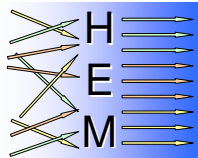
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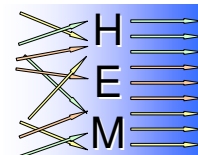
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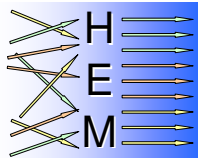




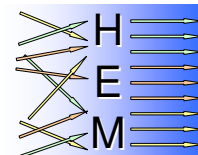
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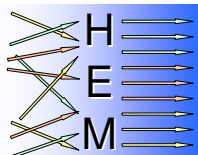


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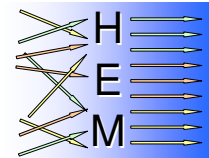
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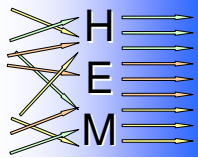
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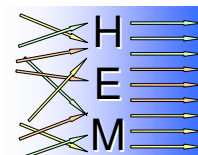
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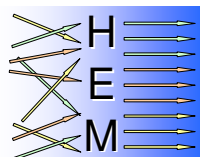
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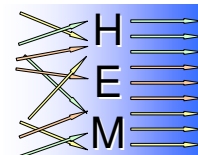
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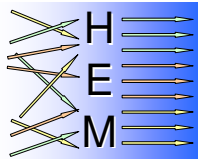
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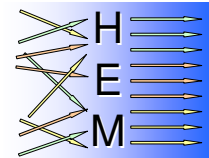
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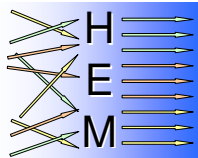
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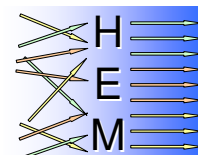
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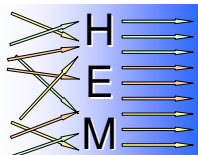
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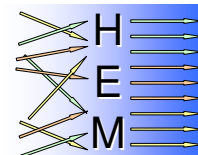
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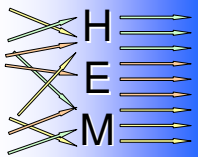
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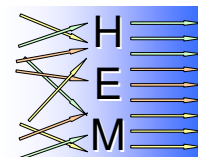




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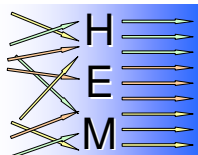
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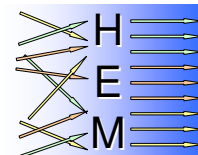




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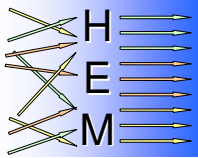
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