Hercules System/370, ESA/390, z/Architecture Emulator

Hercules – Reference Summary

Version 3 Release 13

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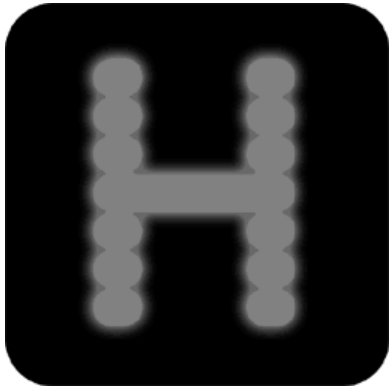

First Edition, May 06, 2018
HERS031300-00

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1. Preface

1.1 Edition information

This edition applies to the Hercules S/370, ESA/390 and z/Architecture Emulator, Release 3.13.0 and to all subsequent versions, releases and modifications until otherwise indicated in new editions. Make sure you are using the correct edition for the level of software you are using.

1.2 Revision Notice

Hercules Release:	Version 3 Release 13 Modification 0
Publication Number:	HERS031300
SoftCopy Name:	HerculesReferenceSummary
Revision Number:	HERS031300-00
Date:	May 06, 2018

1.3 Readers Comments

If you like or dislike anything of this book please send a mail or email to the address below. Feel free to comment any errors or lack of clarity. Please limit your comments on the information in this specific book and also include the “Revision Notice” just above. Thank you for your help.

Send your comments by email to the Hercules-390 discussion group:

hercules-390@yahoogroups.com

2. Hercules Configuration File

2.1 System Parameters

System Parameter	Description
#	Comment line
*	Comment line
ARCHMODE	Initial architecture mode
ASN_AND_LX_REUSE (ALRF)	ESAME ASN and LX REUSE feature
AUTOMOUNT	Tape automount root directory
AUTO_SCSI_MOUNT	Automatic SCSI tape mounts
CCKD	Compressed CKD DASD options
CNSLPORT	Telnet client port
CODEPAGE	Codepage conversion table
CONKPALV	Console and telnet clients keep-alive option
CPUMODEL	CPU model
CPUPRIO	CPU thread process priority
CPUSERIAL	CPU serial number
CPUVERID	CPU version code
DEFSYM	Define symbol
DEVPRIO	Device threads process priority
DEVTMAX	Maximum number of device threads

System Parameter	Description
DIAG8CMD	DIAGNOSE 8 cmd setting
ECPSVM	ECPS:VM support status (VM)
ENGINES	Processor engine type
HERCLOGO	Hercules 3270 logo
HERCPRIO	Hercules process priority
HTTPPORT	HTTP server port
HTTPROOT	HTTP server root directory
IGNORE	Ignore subsequent INCLUDE errors
INCLUDE	Include configuration file
IODELAY	I/O interrupt wait time (LINUX)
LDMOD	Additional dynamic load modules
LEGACYSENSEID	SENSE ID CCW (x'E4') feature
LOADPARM	IPL parameter
LOGOPT	Log options
LPARNAME	LPAR name returned by DIAG x'204'
LPARNUM	LPAR identification number
MAINSIZE	Main storage in MB
MANUFACTURER	Manufacturer name returned by STSI instruction
MAXCPU	Maximum number of CPUs
MODEL	Model names returned by STSI instruction
MODPATH	Dynamic load module path

System Parameter	Description
MOUNTED_TAPE_REINIT	Control tape initialization
NUMCPU	Number of emulated CPUs
NUMVEC	Number of vector facilities
OSTAILOR	Intended operating system
PANRATE	Panel refresh rate
PANTITLE	Hercules console panel title
PGMPRDOS	Emulation of IFL HW
PLANT	Plant name returned by STSI instruction
SCLPROOT	SCLP base directory
SHCMDOPT	Shell command option
SHRDPORT	Shared device server port
SYSEPOCH	Base date for TOD clock
TIMERINT	Internal timer update interval
TODDRAG	TOD clock drag factor
TODPRIO	Timer thread process priority
TRACEOPT	Instruction trace display option
TZOFFSET	TOD clock offset from GMT
XPNDSIZE	Expanded storage in MB
YROFFSET	TOD clock offset from actual date

Table 1: Hercules System Parameters

2.2 Device Definitions

Device Type	Device	Emulated by
3270, 3278	Local non-SNA display or printer	TN3270 client connection
SYSG	Integrated 3270 (SYSG) console	TN3270 client connection
1052, 3215	Console printer-keyboards	Telnet client connection
1052-C, 3215-C	Integrated console printer-keyboards	Integrated on Hercules console
1442, 2501, 3505	Card readers	Disk file(s), ASCII or EBCDIC
3525	Card punch	Disk file, ASCII or EBCDIC
1403, 3211	Line printers	Disk file, ASCII
3410, 3420, 3422, 3430, 3480, 3490, 3590, 9347, 8809	Tape drives	Disk file, CD-ROM or SCSI tape
3088	Channel-to-Channel Adapter	“CTCT” driver
((CTCI))	Channel-to-Channel link to host TCP/IP stack	“CTCI” TUN/TAP driver
((LCS))	IBM 2216 router, IBM 3172 running ICP, IBM 8232 LCS device, LCS3172 driver of a P/390, IBM Open Systems Adapter (OSA)	“LCS” (LAN channel station) TUN/TAP driver
3310, 3370, 9332, 9335, 9336, 0671	FBA direct access storage devices	Disk file

Device Type	Device	Emulated by
2305, 2311, 2314, 3330, 3340, 3350, 3375, 3380, 3390, 9345	CKD direct access storage devices	Disk file
2703	Communication line	TCP socket

Table 2: Hercules Device Definitions

3. System Parameter Descriptions

or * (Comment lines)

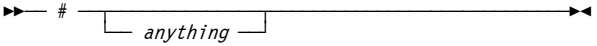
Descriptive

[*anything*]

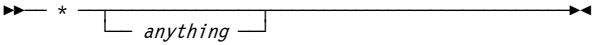
or

* [*anything*]

Diagram



or

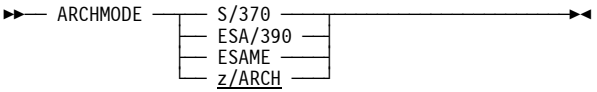


ARCHMODE (Initial architecture mode)

Descriptive

ARCHMODE {S/370 | ESA/390 | ESAME | z/ARCH}

Diagram



ASN_AND_LX_REUSE / ALRF (ESAME ASN and LX REUSE feature)

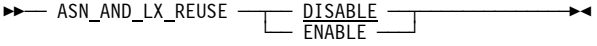
Descriptive

ASN_AND_LX_REUSE {DISABLE | ENABLE}

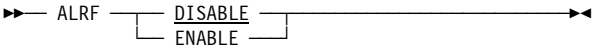
or

ALRF {DISABLE | ENABLE}

Diagram



or



AUTOMOUNT (Tape automount root directory)

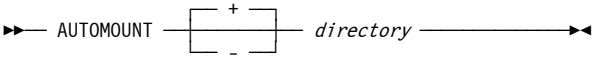
Descriptive

AUTOMOUNT [+ | -]*directory*

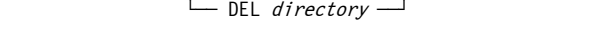
or

AUTOMOUNT {ADD *directory* | DEL *directory*}

Diagram



or

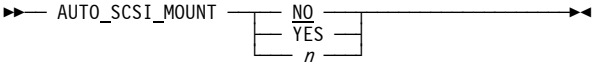


AUTO_SCSI_MOUNT (Automatic SCSI tape mounts)

Descriptive

AUTO_SCSI_MOUNT {NO | YES | *n*}

Diagram



CCKD (Compressed CKD DASD options)

Descriptive

CCKD *option=value* [,*option=value* ...]

where option can be:

[COMP={-1 | *n*}]

[,COMPPARM={-1 | *n*}]

[,RA={2 | *n*}]

[,RAQ={4 | *n*}]

[,RAT={2 | *n*}]

[,WR={2 | *n*}]

[,GCINT={10 | *n*}]

[,GCPARM={0 | *n*}]

[,NOSTRESS={0 | 1}]

[,FREEPEND={-1 | *n*}]

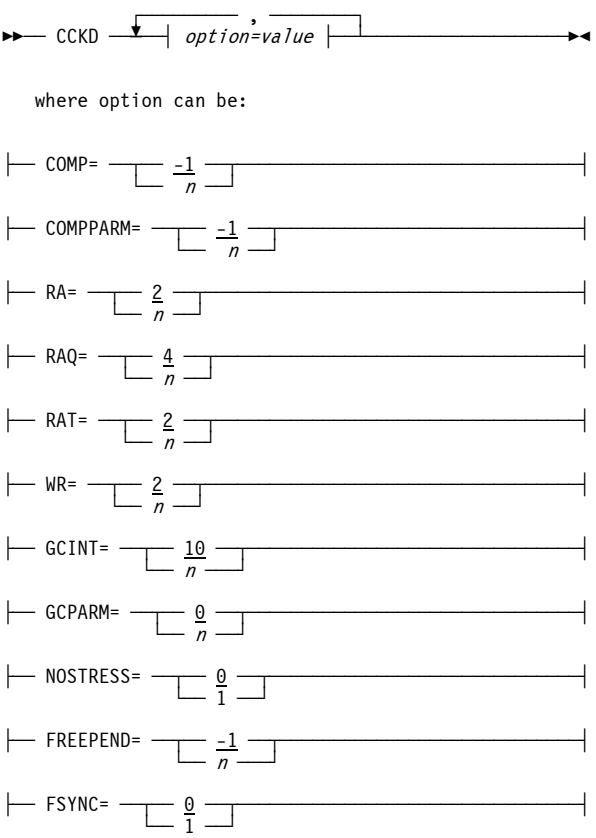
[,FSYNC={0 | 1}]

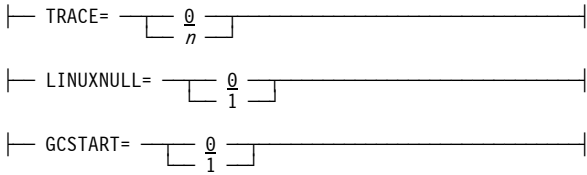
[,TRACE={0 | *n*}]

[,LINUXNULL={0 | 1}]

[,GCSTART={0 | 1}]

Diagram



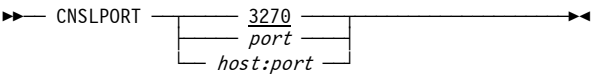


CNSLPORT (Telnet client port)

Descriptive

CNSLPORT {3270 | *port* | *host:port*}

Diagram

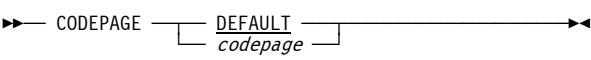


CODEPAGE (Codepage conversion table)

Descriptive

CODEPAGE {DEFAULT | *codepage*}

Diagram

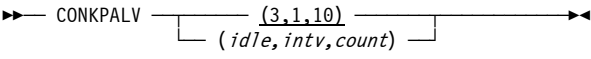


CONKPALV (Console and telnet clients keep-alive option)

Descriptive

CONKPALV {(3,1,10) | (*idle*,*intv*,*count*)}

Diagram

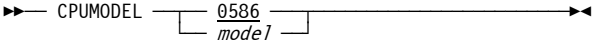


CPUMODEL (CPU model)

Descriptive

CPUMODEL {0586 | *model*}

Diagram

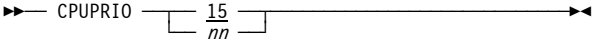


CPUPRIO (CPU thread process priority)

Descriptive

CPUPRIO {15 | *nn*}

Diagram

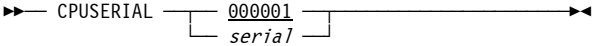


CPUSERIAL (CPU serial number)

Descriptive

CPUSERIAL {000001 | *serial*}

Diagram



CPUVERID (CPU version code)

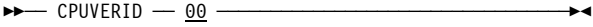
Descriptive

CPUVERID 00 (For z/ARCH and ESAME)

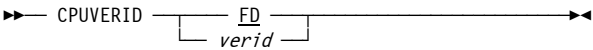
CPUVERID {FD | *verid*} (For S/370 and ESA/390)

Diagram

For z/ARCH and ESAME:



For S/370 and ESA/390:

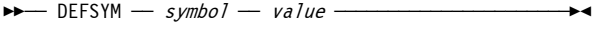


DEFSYM (Define symbol)

Descriptive

DEFSYM *symbol value*

Diagram

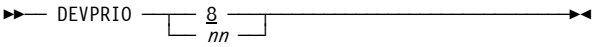


DEVPRIO (Device threads process priority)

Descriptive

DEVPRIO {8 | *nn*}

Diagram

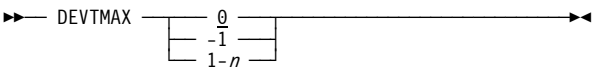


DEVTMAX (Maximum number of device threads)

Descriptive

DEVTMAX {0 | -1 | 1-*n*}

Diagram

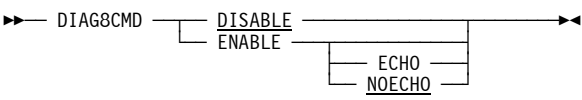


DIAG8CMD (DIAGNOSE 8 command setting)

Descriptive

DIAG8CMD {DISABLE | ENABLE [ECHO | NOECHO]}

Diagram

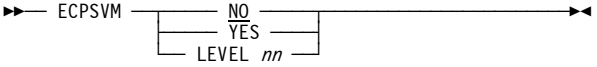


ECPSVM (ECPS:VM support status (VM))

Descriptive

ECPSVM {NO | YES | LEVEL *nn*}

Diagram

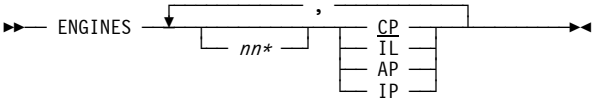


ENGINES (Processor engines type)

Descriptive

ENGINES [*nn**] {CP | IL | AP | IP} [, ...]

Diagram



HERCLOGO (Hercules 3270 logo)

Descriptive

HERCLOGO *filename*

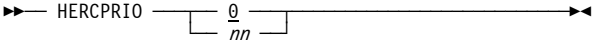
Diagram

HERCPRIO (Hercules process priority)

Descriptive

HERCPRIO {0 | *nn*}

Diagram

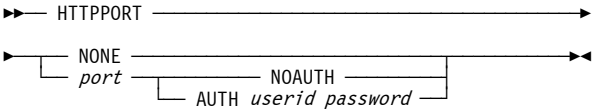


HTTPPORT (HTTP server port)

Descriptive

HTTPPORT NONE | *port* {NOAUTH | AUTH *userid password*}

Diagram



HTTPROOT (HTTP server root directory)

Descriptive

HTTPROOT *path*

Diagram

IGNORE (Ignore subsequent INCLUDE errors)

Descriptive

IGNORE INCLUDE_ERRORS

Diagram

INCLUDE (Include configuration file)

Descriptive

INCLUDE *filepath*

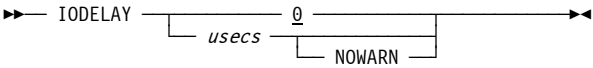
Diagram

IODELAY (I/O interrupt wait time (LINUX))

Descriptive

IODELAY {0 | *usecs* [NOWARN]}

Diagram

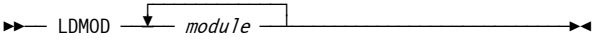


LDMOD (Additional dynamic load modules)

Descriptive

LMOD *module module module* ...

Diagram

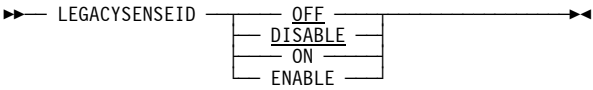


LEGACYSENSEID (SENSE ID CCW (x'E40) feature)

Descriptive

LEGACYSENSEID [{OFF | DISABLE} | {ON | ENABLE}]

Diagram

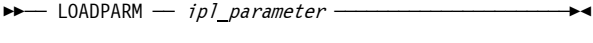


LOADPARM (IPL parameter)

Descriptive

LOADPARM *ipl_parameter*

Diagram

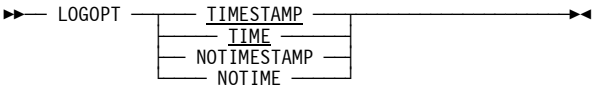


LOGOPT (Log options)

Descriptive

LOGOPT {TIMESTAMP | TIME | NOTIMESTAMP | NOTIME}

Diagram

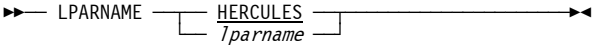


LPARNAME (LPAR name returned by DIAG x'204')

Descriptive

LPARNAME {HERCULES | *lparname*}

Diagram

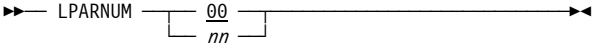


LPARNUM (LPAR identification number)

Descriptive

LPARNUM {00 | *nn*}

Diagram

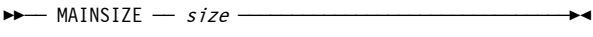


MAINSIZE (Main storage in MB)

Descriptive

MAINSIZE *size*

Diagram

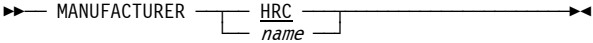


MANUFACTURER (Manufacturer name returned STSI instruction)

Descriptive

MANUFACTURER {HRC | *name*}

Diagram

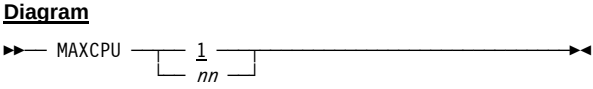


MAXCPU (Maximum number of CPUs)

Descriptive

MAXCPU {1 | *nn*}

Diagram

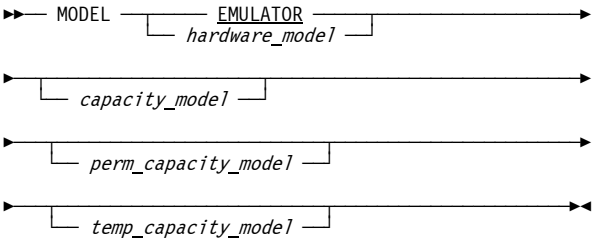


MODEL (Model names retuned by STSI instruction)

Descriptive

MODEL {EMULATOR | *hardware_model*} [*capacity_model*]
[*perm_capacity_model*] [*temp_capacity_model*]

Diagram

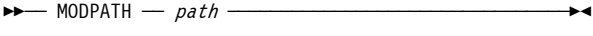


MODPATH (Dynamic load module path)

Descriptive

MODPATH *path*

Diagram

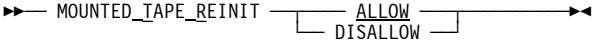


MOUNTED_TAPE_REINIT (Control tape initialization)

Descriptive

```
MOUNTED_TAPE_REINIT {ALLOW | DISALLOW}
```

Diagram

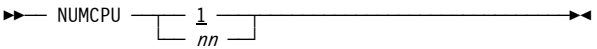


NUMCPU (Number of emulated CPUs)

Descriptive

```
NUMCPU {1 | nn}
```

Diagram

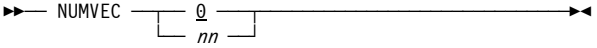


NUMVEC (Number of vector facilities)

Descriptive

```
NUMVEC {0 | nn}
```

Diagram

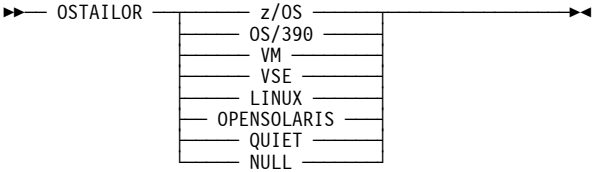


OSTAILOR (Intended operating system)

Descriptive

```
OSTAILOR {z/OS | OS/390 | VM | VSE | LINUX |
          OPENSOLARIS | QUIET | NULL}
```

Diagram

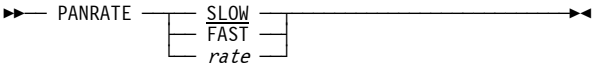


PANRATE (Panel refresh rate)

Descriptive

PANRATE {SLOW | FAST | *rate*}

Diagram

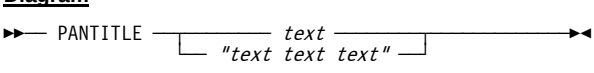


PANTITLE (Hercules console window title)

Descriptive

PANTITLE {*text* | *"text text text"*}

Diagram

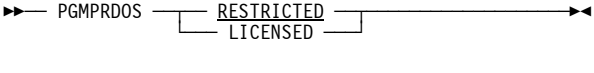


PGMPRDOS (Emulation of IFL HW)

Descriptive

PGMPRDOS {RESTRICTED | LICENSED}

Diagram

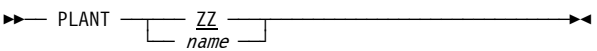


PLANT (Plant name returned by STSI instruction)

Descriptive

PLANT {ZZ | *name*}

Diagram

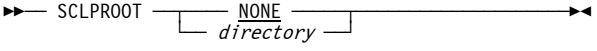


SCLPROOT (SCLP base directory)

Descriptive

SCLPROOT {NONE | *directory*}

Diagram

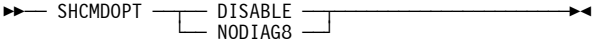


SHCMDOPT (Shell command option)

Descriptive

SHCMDOPT {DISABLE | NODIAG8}

Diagram

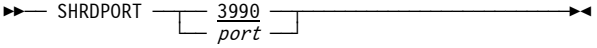


SHRDPORT (Shared device server port)

Descriptive

SHRDPORT {3990 | *port*}

Diagram

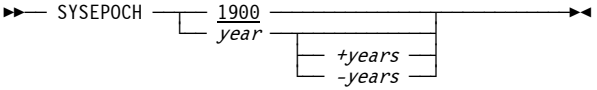


SYSEPOCH (Base date for TOD clock)

Descriptive

SYSEPOCH {1900 | 1960 | *year* [+*years* | -*years*]}

Diagram

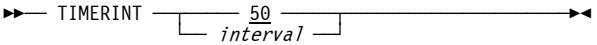


TIMERINT (Internal timer update interval)

Descriptive

TIMERINT {50 | *interval*}

Diagram

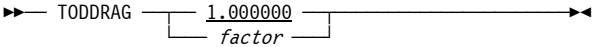


TODDRAG (TOD clock drag factor)

Descriptive

TODDRAG {1.000000 | *factor*}

Diagram

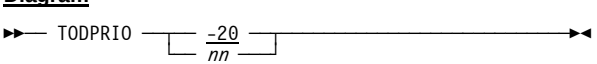


TODPRIO (Timer thread process priority)

Descriptive

TODPRIO {-20 | *nn*}

Diagram

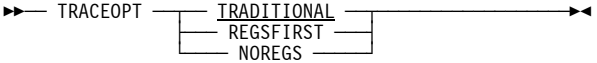


TRACEOPT (Instruction trace display option)

Descriptive

TRACEOPT {TRADITIONAL | REGSFIRST | NOREGS}

Diagram

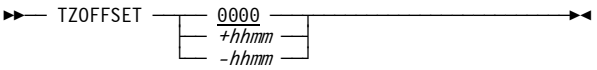


TZOFFSET (TOD clock offset from GMT)

Descriptive

TZOFFSET {0000 | *+hhmm* | *-hhmm*}

Diagram

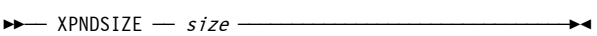


XPNDSIZE (Expanded storage in MB)

Descriptive

XPNDSIZE *size*

Diagram

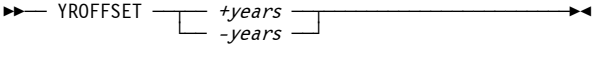


YROFFSET (TOD clock offset from actual date)

Descriptive

YROFFSET {*+years* | *-years*}

Diagram



Process and Thread Priorities

Process Priorities

Unix Process Priority	Windows Priority Class
-20 to -16	Realtime
-15 to -9	High
-8 to -1	Above Normal
0 to 7	Normal
8 to 15	Below Normal
16 to 20	Low

Table 3: Process Priority Conversions

Thread Priorities

Unix Thread Priority	Windows Thread Priority
-20 to -16	Time Critical
-15 to -9	Highest
-8 to -1	Above Normal
0 to 7	Normal
8 to 15	Below Normal
16 to 19	Lowest
20	Idle

Table 4: Thread Priority Conversions

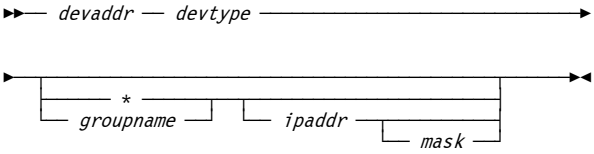
4. Device Definition Descriptions

Local non-SNA 3270 Devices

Descriptive

devaddr devtype [{*groupname* | *}] [*ipaddr* [*mask*]]]

Diagram

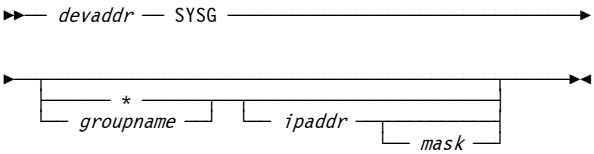


Integrated 3270 (SYSG) Console

Descriptive

devaddr SYSG [{*groupname* | *}] [*ipaddr* [*mask*]]]

Diagram



Note: The device address is ignored for the integrated 3270 (SYSG) console.

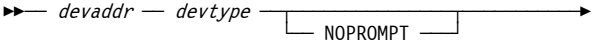
Console Printer-Keyboard Devices

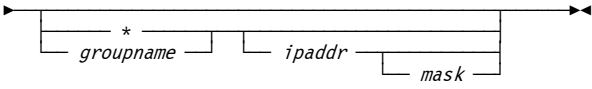
Descriptive

devaddr devtype [NOPROMPT]

[{*groupname* | *}] [*ipaddr* [*mask*]]]

Diagram



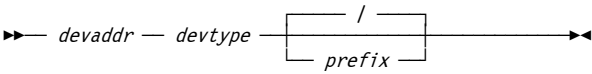


Integrated Console Printer-Keyboard Devices

Descriptive

devaddr devtype [*prefix* | /]

Diagram

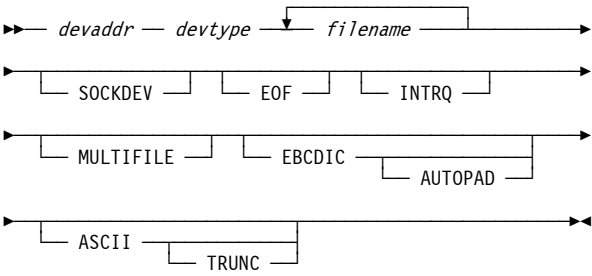


Card Reader Devices

Descriptive

devaddr devtype filename [*filename* ...]
[SOCKDEV] [EOF] [INTRQ] [MULTIFILE]
[EBCDIC [AUTOPAD]] [ASCII [TRUNC]]

Diagram

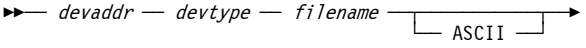


Card Punch Devices

Descriptive

devaddr devtype filename [ASCII] [CRLF] [NOCLEAR]

Diagram



Line Printer Devices

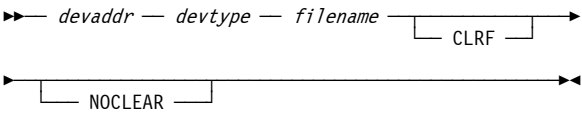
Descriptive

devaddr devtype filename [CRLF] [NOCLEAR]

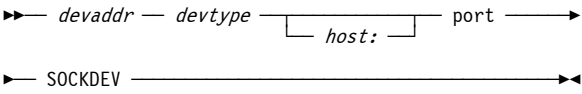
or

devaddr devtype [*host:*]*port* SOCKDEV

Diagram



or



Emulated Tape Devices

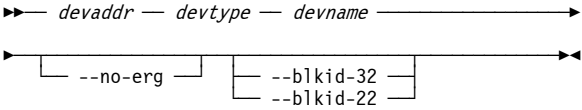
SCSI Tapes

Descriptive

devaddr devtype devname [--no-erg]

[--blkid-32 | --blkid-22]

Diagram

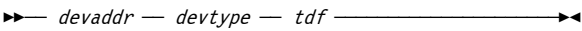


Optical Media Attach (OMA) virtual files

Descriptive

devaddr devtype tdf

Diagram



AWSTAPE virtual files

Descriptive

devaddr devtype {*awsfile* | ***} [*arguments*]

where arguments are:

[MAXSIZE={*n* | 0} | MAXSIZEK={*n* | 0} | MAXSIZEM={*n* | 0}]

[EOTMARGIN=*n*]

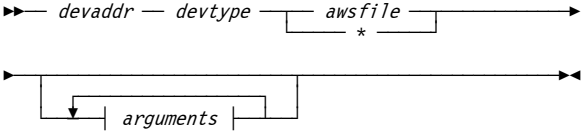
[READONLY={0 | 1}]

[RO | NORING | RW | RING]

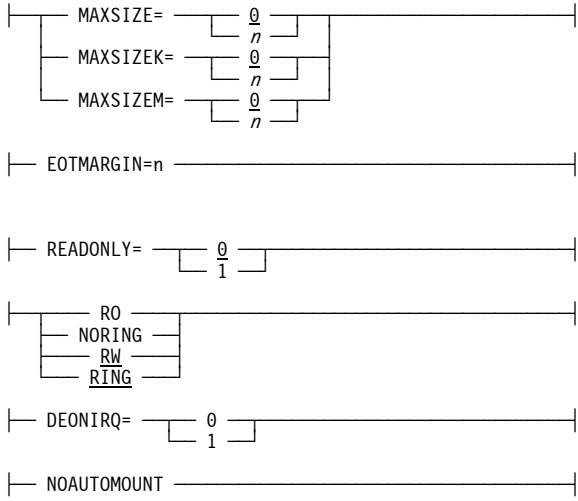
[DEONIRQ={0 | 1}]

[NOAUTOMOUNT]

Diagram



where arguments are:



Fake Tape virtual files

Descriptive

devaddr devtype {*fakefile* | *} [*arguments*]

where arguments are:

[MAXSIZE={*n* | 0} | MAXSIZEK={*n* | 0} | MAXSIZEM={*n* | 0}]

[EOTMARGIN=*n*]

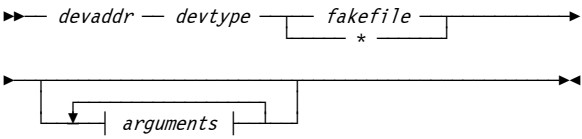
[READONLY={0 | 1}]

[RO | NORING | RW | RING]

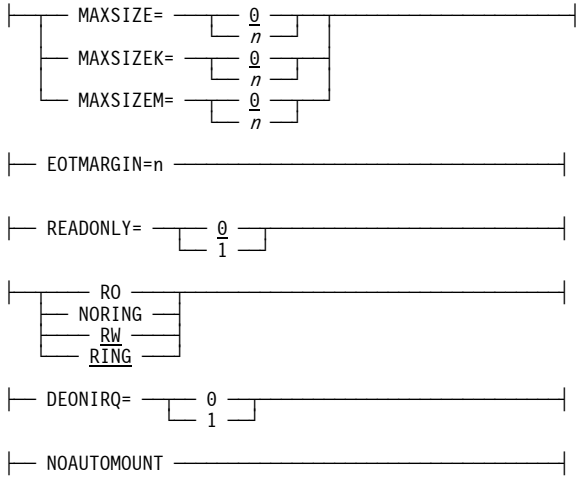
[DEONIRQ={0 | 1}]

[NOAUTOMOUNT]

Diagram



where arguments are:



HET virtual files

Descriptive

devaddr devtype {*hetfile* | ***} [*arguments*]

where arguments are:

[AWSTAPE]

[COMPRESS={0 | 1}]

[IDRC={0 | 1}]

[METHOD={1 | 2}]

[LEVEL={*n* | 4}]

[CHUNKSIZE={*nnnnn* | 65535}]

[MAXSIZE={*n* | 0} | MAXSIZEK={*n* | 0} | MAXSIZEM={*n* | 0}]

[EOTMARGIN=*n*]

[READONLY={0 | 1}]

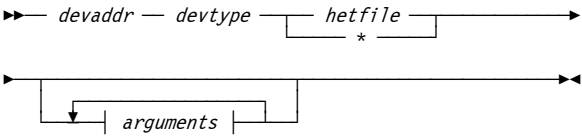
[STRICTSIZE={0 | 1}]

[RO | NORING | RW | RING]

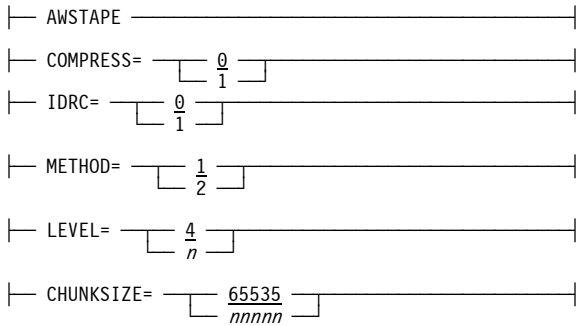
[DEONIRQ={0 | 1}]

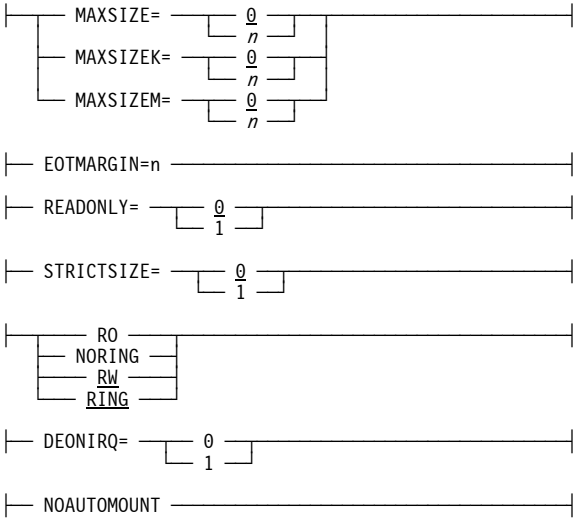
[NOAUTOMOUNT]

Diagram



where arguments are:





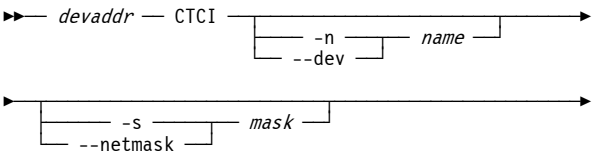
Channel-to-Channel Adapters

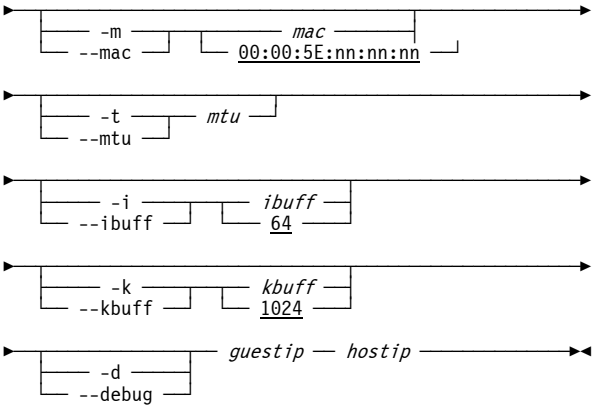
CTCI (Channel-to-Channel link to TCP/IP stack)

Descriptive

devaddr CTCI [{-n | --dev} *name*]
[{-s | --netmask} *mask*]
[{-m | --macaddr}
mac | 00:00:5E:nn:nn:nn}]
[{-t | --mtu} *mtu* | 1500]
[{-i | --ibuff} {*ibuff* | 64}]
[{-k | --kbuff} {*kbuff* | 1024}]
[-d | --debug]
guestip hostip

Diagram



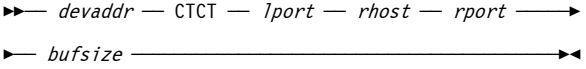


CTCT (Channel-to-Channel emulation via TCP connection)

Descriptive

devaddr CTCT *lport rhost rport bufsize*

Diagram

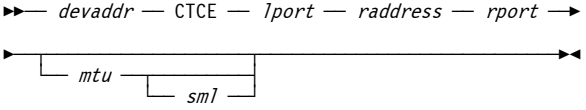


CTCE (Enhanced Channel-to-Channel emulation via TCP connection)

Descriptive

devaddr CTCE *lport raddress rport* [*mtu* [*sml*]]

Diagram



LCS (LAN Channel Station)

Descriptive

devaddr LCS [{-n | --dev} *name*]

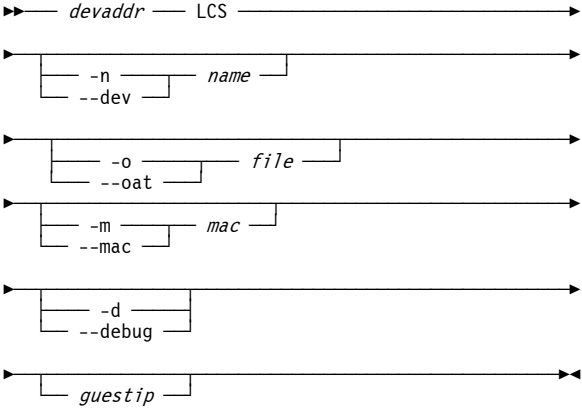
[{-o | --oat} *file*]

[{-m | --mac} *mac*]

[-d | --debug]

[*guestip*]

Diagram



OAT File Syntax

```
*********************************************
* Dev   Mode  Port  Entry specific information
*********************************************
  0400  IP    00    PRI  172.021.003.032
  0402  IP    00    SEC  172.021.003.033
  0404  IP    00    NO   172.021.003.038
  0406  IP    01    NO   172.021.002.016
  040E  SNA   00
HWADD  00  02:00:FE:DF:00:42
HWADD  01  02:00:FE:DF:00:43
ROUTE  00  172.021.003.032  255.255.255.224
```

FBA DASD Devices

Descriptive

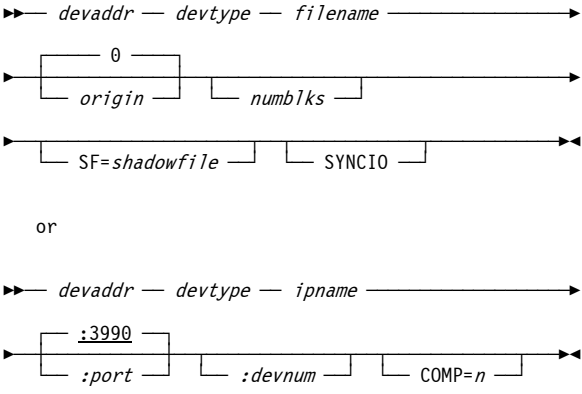
devaddr devtype filename [*origin* | 0] [*numblks*]

[sf=*shadowfile*] [SYNCIO]

or

devaddr devtype ipname [*:port* | :3990] [*:devnum*]

Diagram



CKD DASD Devices

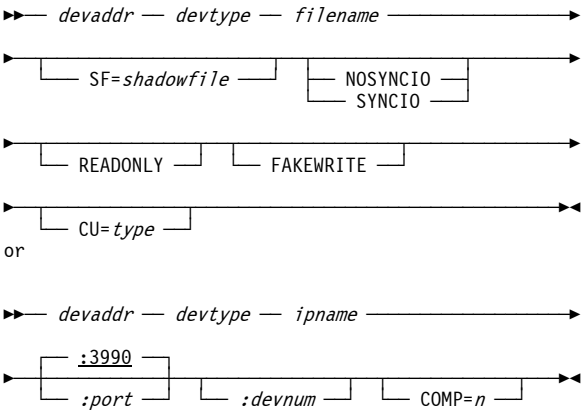
Descriptive

devaddr devtype filename [sf=*shadowfile*]
[{NOSYNCIO | SYNCIO}] [READONLY]
[FAKEWRITE] [CU=*type*]

or

devaddr devtype ipname [*:port* | :3990] [*:devnum*]

Diagram



Default CU Types

Device Type	Default CU Type
2305, 2311, 2314	2841
3330, 3340, 3350, 3375, 3380	3880
3390	3990
9345	9343

Table 5: Default CU Types

Communication Lines (Preliminary 2703 BSC Support)

Descriptive

devaddr devtype

DIAL={IN | OUT | INOUT | NO}

LHOST={*hostname* | *ipaddress* | *}

LPORT={*servicename* | *port*}

RHOST={*hostname* | i*paddress*}

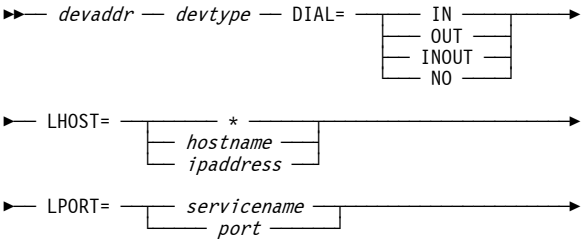
RPORT={*servicename* | *port*}

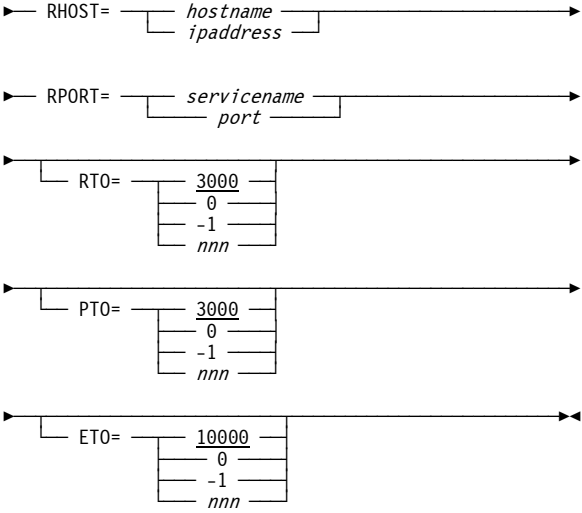
[RTO={0 | -1 | *nnn* | 3000}]

[PTO={0 | -1 | *nnn* | 3000}]

[ETO={0 | -1 | *nnn* | 10000}]

Diagram




RHOST=
hostname
ipaddress
RPORT=
servicename
port
RTO=
3000
0
-1
nnn
PTO=
3000
0
-1
nnn
ETO=
10000
0
-1
nnn

5. Hercules Console Commands

Command	Description
!message	SCP priority message
#	Log comment to syslog
*	Log comment to syslog
.reply	SCP command
?	List all commands / command specific help (alias for help)
aea	Display AEA (absolute-effective-address) tables
aia	Display AIA (absolute-instruction-address) tables
ar	Display access registers
archmode	Set architecture mode
attach	Configure device
auto_scsi_mount	Automatic SCSI tape mounts
automount	Show or update allowable tape automount directories
b	Set breakpoint
b+	Set breakpoint
b-	Delete breakpoint
cache	Cache command
cckd	CCKD command
cd	Change directory
cf	Configure CPU online or offline

Command	Description
cfall	Configure all CPU's online or offline
clocks	Display TOD clock and CPU timer
cmdtgt	Specify the command target
conkpalv	Display / alter console TCP/IP keep-alive settings
cpu	Define target CPU for console display and commands
cr	Display or alter control registers
cscript	Cancel a running script thread
ctc	Enable / disable CTC debugging
define	Rename device
defsym	Define symbol
detach	Remove device
devinit	Reinitialize device
devlist	List device or all devices
devtmax	Display or set max device threads
ds	Display subchannel
ecpsvm	ECPS:VM commands
exit	Terminate the emulator
ext	Generate external interrupt
f{+/-} addr	Mark frames usable / unusable
fpc	Display floating point control registers
fpr	Display floating point register
g	Turn off instruction stepping and start CPU

Command	Description
gpr	Display or alter general purpose registers
hao	Hercules Automatic Operator (HAO)
help	List all commands / command specific help
herc	Send Hercules command
herclogo	Read a new Hercules logo file
hst	History of commands
i	Generate I/O attention interrupt for device
iodelay	Display or set I/O delay value
ipending	Display pending interrupts
ipl	IPL normal from device xxxx
iplc	IPL clear from device xxxx
k	Display CCKD internal trace
ldmod	Load a module
loadcore	Load a core image file
loadparm	Set IPL parameter
loadtext	Load a text deck file
log	Direct log output
logopt	Change log options
lparname	Display or define LPAR name
lparnum	Display or set LPAR identification number
lsdep	List module dependencies

Command	Description
lsmod	List dynamic modules
maxrates	Display maximum observed MIPS / SIO rate or define new reporting interval
message	Display message on console like VM
mounted_tape_reinit	Control tape initialization
msg	Display message on console like VM
msghld	Display or set timeout value of held messages
msgnoh	Display message on console like VM, but without header
ostailor	Specify intended operating system
panrate	Display or set console refresh rate
pgmtrace	Trace program interrupts
pr	Display prefix register
pscp	Send system control program priority message
psw	Display or alter program status word
ptt	Set / display pthread trace
pwd	Print working directory
qd	Query DASD
quiet	Toggle automatic refresh of console display data
quit	Terminate the emulator
r	Display or alter real storage
restart	Generate restart interrupt

resume	Resume Hercules
rmmod	Delete a module
s	Instruction stepping
s+	Instruction stepping on
s-	Instruction stepping off
s?	Instruction stepping query
s{+/-} dev	Turn CCW stepping on / off
savecore	Save a core image file
sclproot	Set or display SCLP base directory
scp	Send system control program command
script	Run a sequence of console commands contained in a file
scsimount	Automatic SCSI tape mounts
sf+	Create a new shadow file
sf-	Remove a shadow file
sfc	Compress a shadow file
sfd	Display shadow file statistics
sfk	Perform a chkdsk on the active shadow file
sh	Shell command
shrd	SHRD command
sizeof	Display size of structures
ssd	Signal Shutdown
start	Start CPU or printer device
startall	Start all CPU's

stop	Stop CPU or printer device
stopall	Stop all CPU's
store	Store CPU status at absolute zero
suspend	Suspend Hercules
syncio	Display syncio device statistics
sysclear	Issue SYSTEM CLEAR RESET manual operation
sysreset	Issue SYSTEM RESET manual operation
t	Instruction trace
t+	Instruction trace on
t-	Instruction trace off
t?	Instruction trace query
t{+/-} CKD	Turn CKD_KEY tracing on / off
t{+/-} dev	Turn CCW tracing on / off
timerint	Display or set timers update interval
tlb	Display TLB tables
toddrag	Display or set TOD clock drag factor
traceopt	Instruction trace display option
tt32	Control / query CTCI-WIN functionality
u	Disassemble storage
uptime	Display Hercules Emulator uptime
v	Display or alter virtual storage
version	Display version information

Table 6: Hercules Console Commands

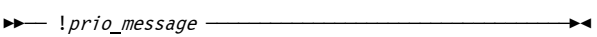
6. Console Command Descriptions

!message (SCP priority message)

Descriptive

!*prio_msg*

Diagram



or * (Log comment to syslog)

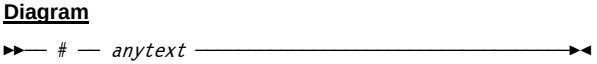
Descriptive

 # anytext

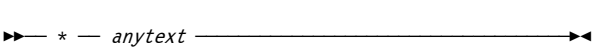
or

** anytext*

Diagram



or



.reply (SCP command)

Descriptive

.reply

Diagram

? (List all commands / command specific help)

Descriptive

? [*command*]

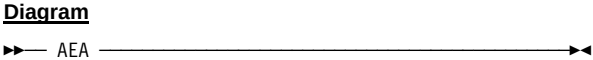
Diagram

AEA (Display AEA absolute-effective-address tables)

Descriptive

AEA

Diagram

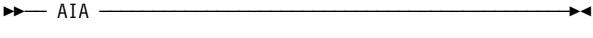


AIA (List AIA absolute-instruction-address fields)

Descriptive

AIA

Diagram

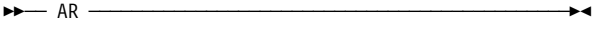


AR (Display access registers)

Descriptive

AR

Diagram

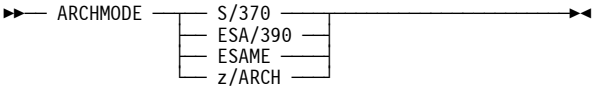


ARCHMODE (Set architecture mode)

Descriptive

ARCHMODE [S/370 | ESA/390 | ESAME | z/ARCH]

Diagram

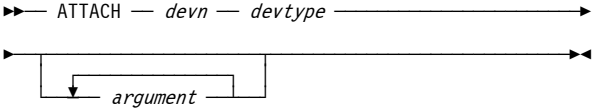


ATTACH (Configure device)

Descriptive

ATTACH *devn type* [*arguments* [*arguments* ...]]

Diagram



AUTOMOUNT (Show or update allowable tape automount directories)

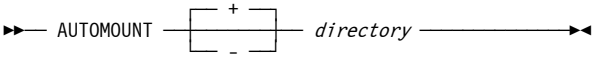
Descriptive

AUTOMOUNT {ADD *directory* | DEL *directory* | LIST}

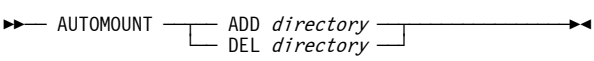
or

AUTOMOUNT [+ | -]*directory*

Diagram



or

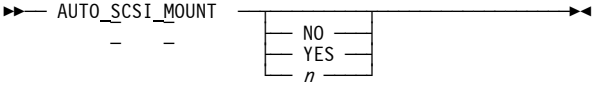


AUTO_SCSI_MOUNT (Automatic SCSI tape mounts)

Descriptive

AUTO_SCSI_MOUNT [NO | YES | *n*]

Diagram

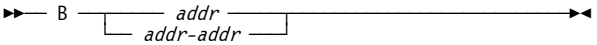


B (Set breakpoint)

Descriptive

B {*addr* | *addr▲addr*}

Diagram

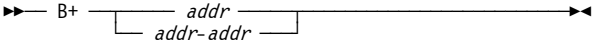


B+ (Set breakpoint)

Descriptive

B+ {*addr* | *addr▲addr*}

Diagram



B- (Delete breakpoint)

Descriptive

B-

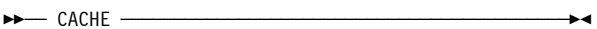
Diagram

CACHE (Cache command)

Descriptive

CACHE

Diagram



CCKD (CCKD command)

Descriptive

CCKD [HELP | STATS | OPTS |

option=value [,*option=value* ...]]

where option can be:

[COMP={-1 | *n*}]

[,COMPPARM={-1 | *n*}]

[,RA={2 | *n*}]

[,RAQ={4 | *n*}]

[,RAT={2 | *n*}]

[,WR={2 | *n*}]

[,GCINT={5 | *n*}]

[,GCPARM={0 | *n*}]

[,NOSTRESS={0 | 1}]

[,FREEPEND={-1 | *n*}]

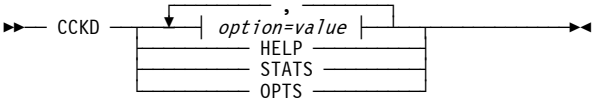
[,FSYNC={0 | 1}]

[,TRACE={0 | *n*}]

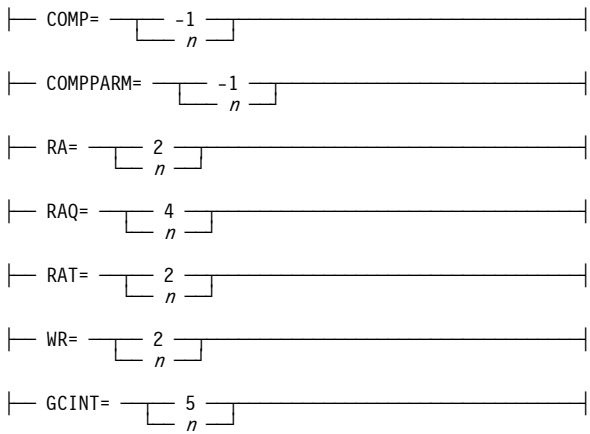
[,LINUXNULL={0 | 1}]

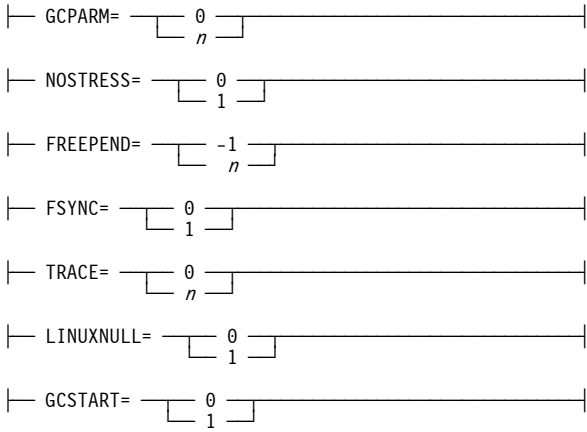
[,GCSTART={0 | 1}]

Diagram



where option can be:



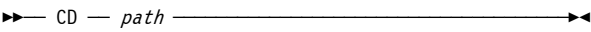


CD (Change directory)

Descriptive

CD *path*

Diagram

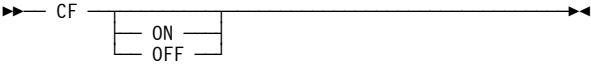


CF (Configure CPU online or offline)

Descriptive

CF [ON | OFF]

Diagram

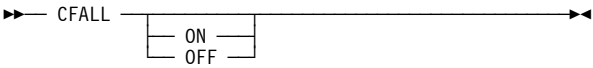


CFALL (Configure all CPUs online or offline)

Descriptive

CFALL [ON | OFF]

Diagram

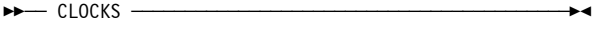


CLOCKS (Display TOD clock and CPU timer)

Descriptive

CLOCKS

Diagram

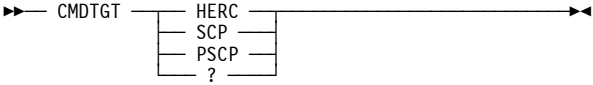


CMDTGT (Specify command target)

Descriptive

CMDTGT {HERC | SCP | PSCP | ?}

Diagram

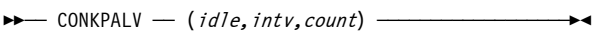


CONKPALV (Specifiy TCP/IP keep alive settings)

Descriptive

CONKPALV (*idle*,*intv*,*count*)

Diagram

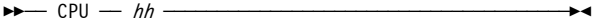


CPU (Define target CPU for console displays and commands)

Descriptive

CPU *hh*

Diagram

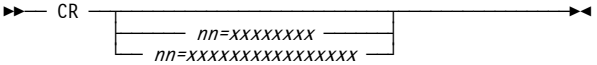


CR (Display or alter control registers)

Descriptive

CR [*nn=xxxxxxxx* | *nn=xxxxxxxxxxxxxxxx*]

Diagram

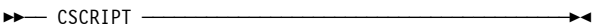


CSCRIPT (Cancel a running script thread)

Descriptive

CSCRIPT

Diagram



CTC (Enable / disable debug packet tracing)

Descriptive

CTC DEBUG {ON | OFF} [*devnum* | ALL]

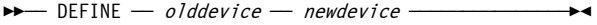
Diagram

DEFINE (Rename device)

Descriptive

DEFINE *olddevice newdevice*

Diagram

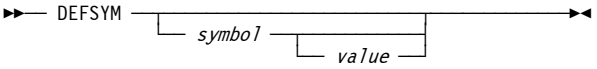


DEFSYM (Define symbol)

Descriptive

DEFSYM [*symbol* [*value*]]

Diagram



DETACH (Remove device)

Descriptive

DETACH *device*

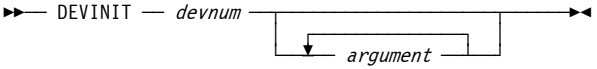
Diagram

DEVINIT (Reinitialize device)

Descriptive

DEVINIT *devnum* [*argument* [*argument* ...]]

Diagram

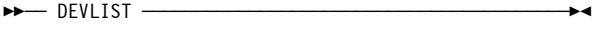


DEVLIST (List all devices)

Descriptive

DEVLIST

Diagram

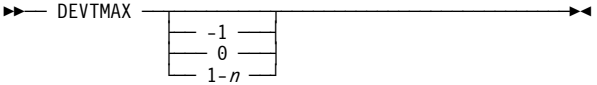


DEVTMAX (Display or set maximum device threads)

Descriptive

DEVTMAX [-1 | 0 | 1-*n*]

Diagram

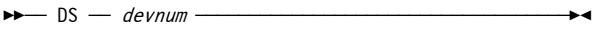


DS (Display subchannel)

Descriptive

DS *devnum*

Diagram



ECPSVM (ECPS:VM commands)

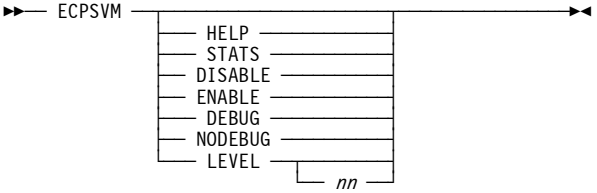
Descriptive

ECPSVM [HELP | STATS | DISABLE | ENABLE | DEBUG |
NODEBUG | LEVEL [*nn*]]

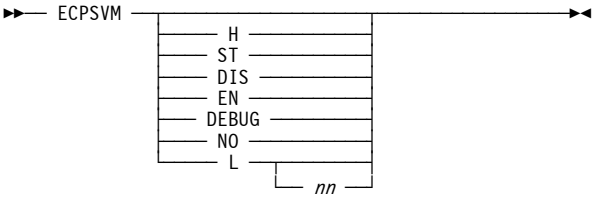
or (with abbreviated arguments)

ECPSVM [H | ST | DIS | EN | DEBUG | NO | L [*nn*]]

Diagram



or (with abbreviated arguments)

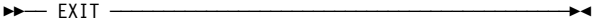


EXIT (Terminate the emulator)

Descriptive

EXIT

Diagram



EXT (Generate external interrupt)

Descriptive

EXT

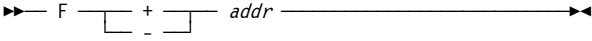
Diagram

F{+/-} (Mark frames usable or unusable)

Descriptive

F{+ | -} *addr*

Diagram

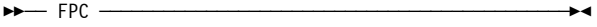


FPC (Display floating point control register)

Descriptive

FPC

Diagram

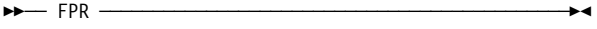


FPR (Display floating point registers)

Descriptive

FPR

Diagram

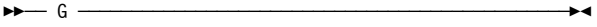


G (Turn off instruction stepping and start CPU)

Descriptive

G

Diagram

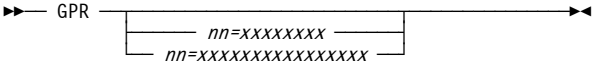


GPR (Display or alter general purpose registers)

Descriptive

GPR [*nn=xxxxxxxx* | *nn=xxxxxxxxxxxxxxxx*]

Diagram



HAO (Hercules Automatic Operator)

Descriptive

HAO TGT *target*

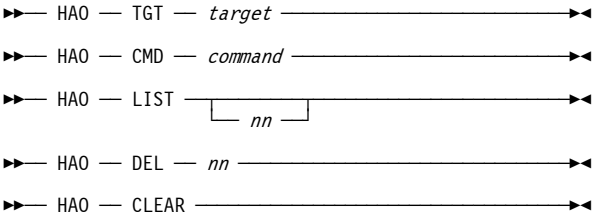
HAO CMD *command*

HAO LIST [*nn*]

HAO DEL *nn*

HAO CLEAR

Diagram

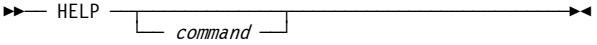


HELP (List all commands / command specific help)

Descriptive

HELP [*command*]

Diagram

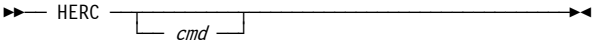


HERC (Send Hercules command)

Descriptive

HERC [*cmd*]

Diagram

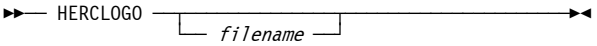


HERCLOGO (Load new Hercules logo file)

Descriptive

HERCLOGO [*filename*]

Diagram



HST (History of commands)

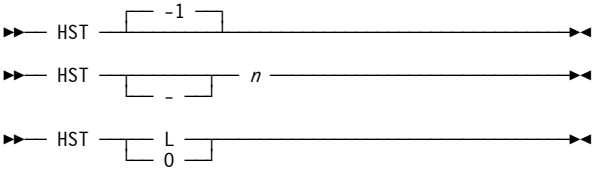
Descriptive

HST [-1]

HST [-]*n*

HST {L | 0}

Diagram

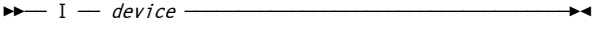


I (Generate I/O attention interrupt for device)

Descriptive

I *device*

Diagram

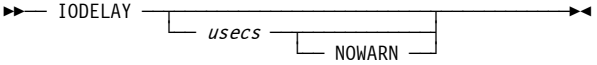


IODELAY (Display or set I/O delay value)

Descriptive

IODELAY [*usecs* [NOWARN]]

Diagram



IPENDING (Display pending interrupts)

Descriptive

IPENDING

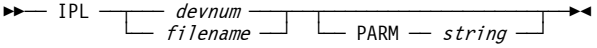
Diagram

IPL (IPL normal from device xxxx)

Descriptive

IPL {*devnum* | *filename*} [PARM *string*]

Diagram

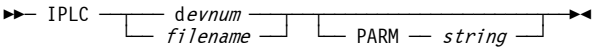


IPLC (IPL clear from device xxxx)

Descriptive

IPLC {*devnum* | *filename*} [PARM *string*]

Diagram

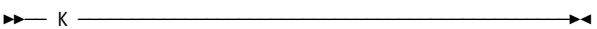


K (Display CCKD internal trace)

Descriptive

K

Diagram

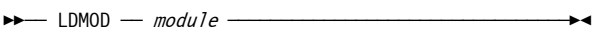


LDMOD (Load a module)

Descriptive

LDMOD *module*

Diagram

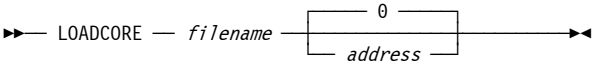


LOADCORE (Load a core image file)

Descriptive

LOADCORE *filename* [*address* | 0]

Diagram

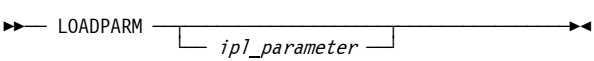


LOADPARM (Set IPL parameter)

Descriptive

LOADPARM [*ipl_parameter*]

Diagram

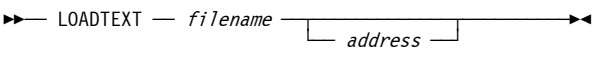


LOADTEXT (Load a text deck file)

Descriptive

LOADTEXT *filename* [*address*]

Diagram

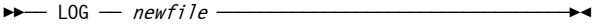


LOG (Direct log output)

Descriptive

LOG *newfile*

Diagram

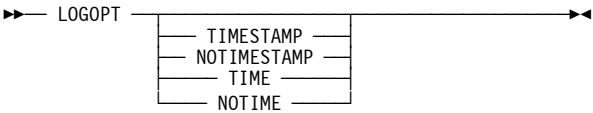


LOGOPT (Change logging options)

Descriptive

LOGOPT [TIMESTAMP | NOTIMESTAMP | TIME | NOTIME]

Diagram

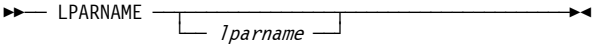


LPARNAME (Display or define LPAR name)

Descriptive

LPARNAME [*lparname*]

Diagram

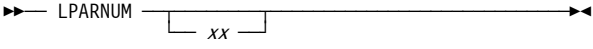


LPARNUM (Display or set LPAR identification number)

Descriptive

LPARNUM [*xx*]

Diagram



LSDEP (List module dependencies)

Descriptive

LSDEP

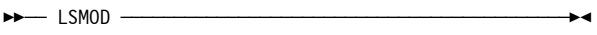
Diagram

LSMOD (List dynamic modules)

Descriptive

LSMOD

Diagram



MAXRATES (Display maximum observed MIPS/SIO rate or define new reporting interval)

Descriptive

MAXRATES [*interval*]

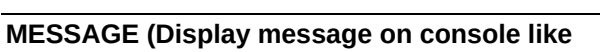
Diagram

MESSAGE (Display message on console like VM)

Descriptive

MESSAGE *parms*

Diagram

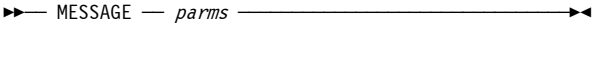


MOUNTED_TAPE_REINIT (Control tape initialization)

Descriptive

MOUNTED_TAPE_REINIT [ALLOW | DISALLOW]

Diagram

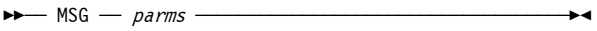


MSG (Display message on console like VM)

Descriptive

MSG *parms*

Diagram

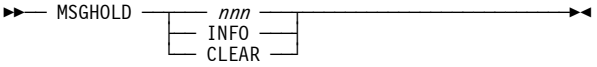


MSGHLD (Display or set timeout of held messages)

Descriptive

```
MSGHLD [nnn | INFO | CLEAR]
```

Diagram

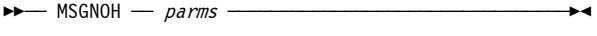


MSGNOH (Display message on console like VM, but without header)

Descriptive

```
MSG parms
```

Diagram

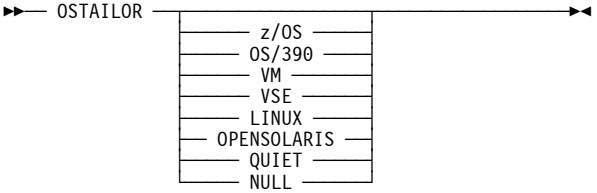


OSTAILOR (Specify intended operating system)

Descriptive

```
OSTAILOR [z/OS | OS/390 | VM | VSE | LINUX |
          OPENSOLARIS | QUIET | NULL]
```

Diagram

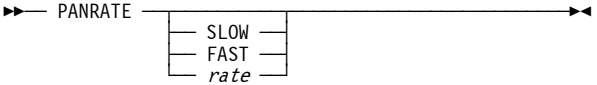


PANRATE (Display or set pamel refresh rate)

Descriptive

PANRATE [SLOW | FAST | *rate*]

Diagram

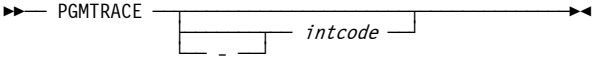


PGMTRACE (Trace program interrupts)

Descriptive

PGMTRACE [[-]*intcode*]

Diagram

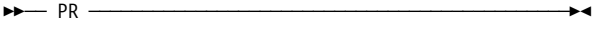


PR (Display prefix register)

Descriptive

PR

Diagram

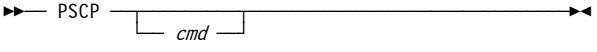


PSCP (Send system control program priority message)

Descriptive

PSCP [*cmd*]

Diagram



PSW (Display or alter program status word)

Descriptive

PSW [*operand=value* [*operand=value* ...]]

where operand is one of the following:

SM=*xx*

PK=*nn*

CMWP=*x*

AS=[PRI | SEC | HOME]

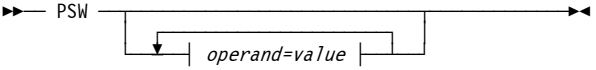
CC=*n*

PM=*x*

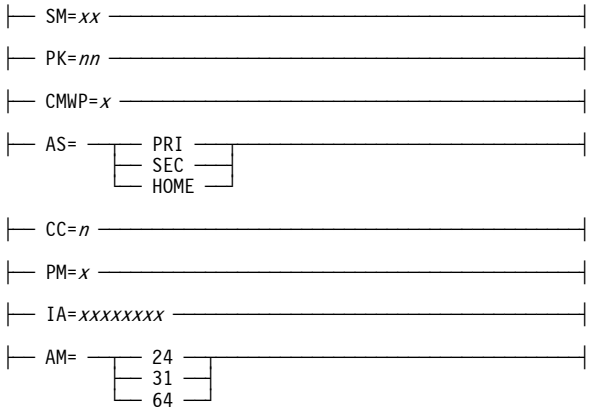
IA=*xxxxxxxx*

AM=[24 | 31 | 64]

Diagram



where operand is one of the following:

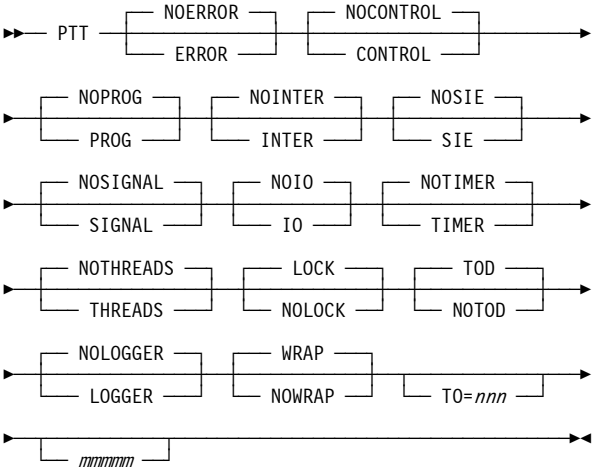


PTT (Set / display pthread trace)

Descriptive

```
PTT [NOERROR | ERROR]
    [NOCONTROL | CONTROL]
    [NOPROG | PROG]
    [NOINTER | INTER]
    [NOSIE | SIE]
    [NOSIGNAL | SIGNAL]
    [NOIO | IO]
    [NOTIMER | TIMER]
    [NOTHREADS | THREADS]
    [NOLOCK | LOCK]
    [NOTOD | TOD]
    [NOLOGGER | LOGGER]
    [NOWRAP | WRAP]
    [TO=nnn] [mmmmm]
```

Diagram

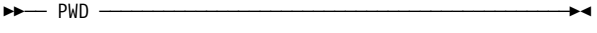


PWD (Print working directory)

Descriptive

PWD

Diagram

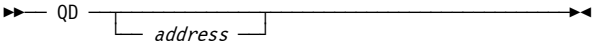


QD (Query DASD)

Descriptive

QD [*address*]

Diagram

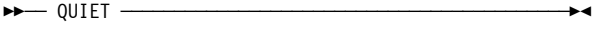


QUIET (Toggle automatic refresh of console display data)

Descriptive

QUIET

Diagram

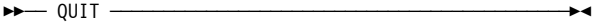


QUIT (Terminate the emulator)

Descriptive

QUIT

Diagram

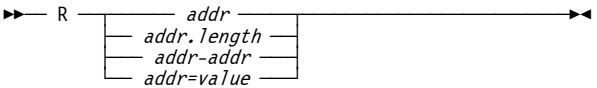


R (Display or alter real storage)

Descriptive

R {*addr* | *addr.length* | *addr-addr* | *addr=value*}

Diagram

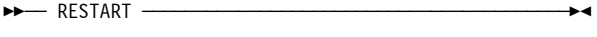


RESTART (Generate restart interrupt)

Descriptive

RESTART

Diagram

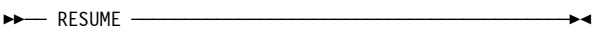


RESUME (Resume Hercules)

Descriptive

RESUME

Diagram



RMMOD (Delete a module)

Descriptive

RMMOD *module*

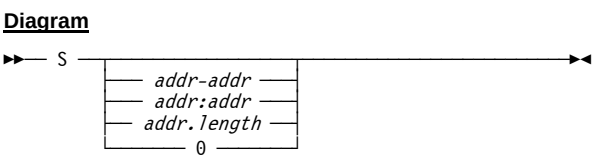
Diagram

S (Instruction stepping)

Descriptive

S [*addr-addr* | *addr:addr* | *addr.length* | 0]

Diagram

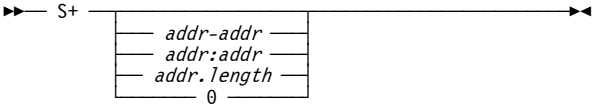


S+ (Instruction stepping on)

Descriptive

S+ [*addr-addr* | *addr:addr* | *addr.length* | 0]

Diagram



S- (Instruction stepping off)

Descriptive

S-

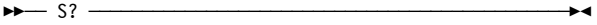
Diagram

S? (Instruction stepping query)

Descriptive

S?

Diagram

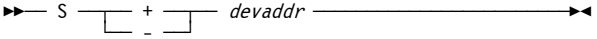


S{+/-} dev (Turn CCW stepping on or off)

Descriptive

S{+ | -} *devaddr*

Diagram

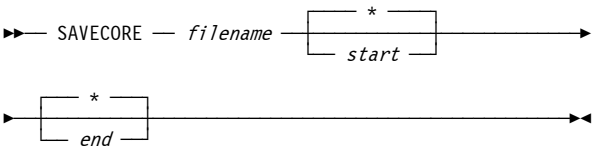


SAVECORE (Save a core image to a file)

Descriptive

SAVECORE *filename* [*start* | *] [*end* | *]

Diagram

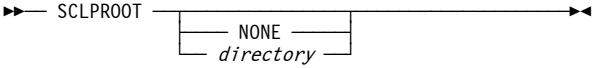


SCLPROOT (Set or display SCLP base directory)

Descriptive

SCLPROOT [NONE | *directory*]

Diagram



SCP (Send system control program command)

Descriptive

SCP [*cmd*]

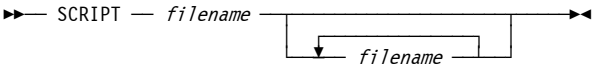
Diagram

SCRIPT (Run a sequence of commands contained in a file)

Descriptive

SCRIPT *filename* [*filename* ...]

Diagram

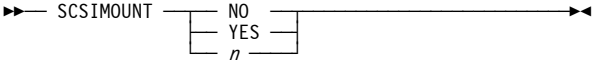


SCSIMOUNT (Automatic SCSI tape mounts)

Descriptive

SCSIMOUNT [NO | YES | *n*]

Diagram

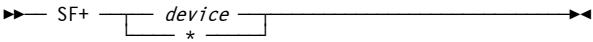


SF+ (Create a new shadow file)

Descriptive

SF+ {*device* | *}

Diagram

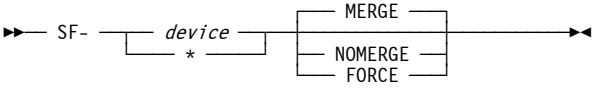


SF- (Remove a shadow file)

Descriptive

SF- {*device* | *} [MERGE | NOMERGE | FORCE]

Diagram

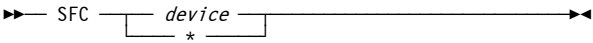


SFC (Compress a shadow file)

Descriptive

SFC {*device* | *}

Diagram

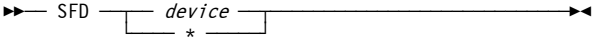


SFD (Display shadow file statistics)

Descriptive

SFD {*device* | *}

Diagram

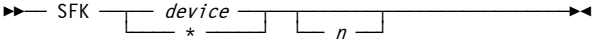


SFK (Perform a chkdsk on the active shadow file)

Descriptive

SFK {*device* | *} [*n*]

Diagram

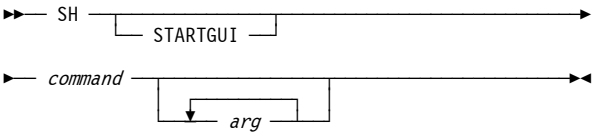


SH (Shell command)

Descriptive

SH [STARTGUI] *command* [*arg* [*arg* ...]]

Diagram

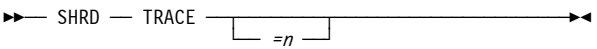


SHRD (SHRD Command)

Descriptive

SHRD TRACE[=*n*]

Diagram

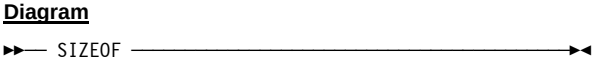


SIZEOF (Display size of structures)

Descriptive

SIZEOF

Diagram

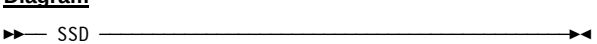


SSD (Signal shutdown)

Descriptive

SSD

Diagram

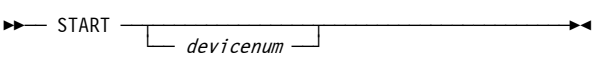


START (Start CPU or printer device)

Descriptive

START [*devicenum*]

Diagram

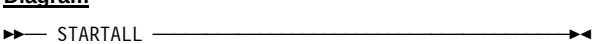


STARTALL (Start all CPUs)

Descriptive

STARTALL

Diagram

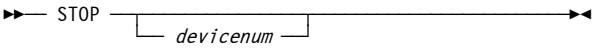


STOP (Stop CPU or printer device)

Descriptive

STOP [*devicenum*]

Diagram

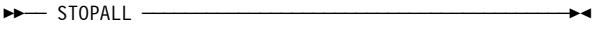


STOPALL (Stop all CPUs)

Descriptive

STOPALL

Diagram



STORE (Store CPU status)

Descriptive

STORE

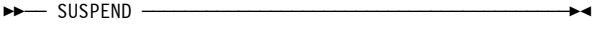
Diagram

SUSPEND (Suspend Hercules)

Descriptive

SUSPEND

Diagram

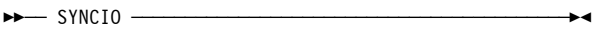


SYNCIO (Display SYNCIO device statistics)

Descriptive

SYNCIO

Diagram

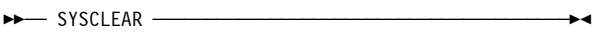


SYSCLEAR (Issue SYSTEM CLEAR RESET manual operation)

Descriptive

SYSCLEAR

Diagram

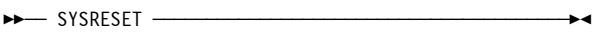


SYSRESET (Issue SYSTEM RESET manual operation)

Descriptive

SYSRESET

Diagram

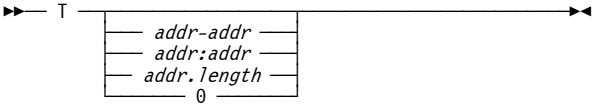


T (Instruction trace)

Descriptive

T [*addr-addr* | *addr:addr* | *addr.length* | 0]

Diagram

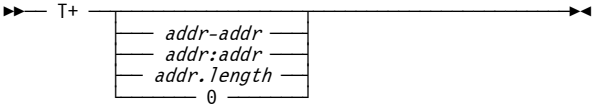


T+ (Instruction trace on)

Descriptive

T+ [*addr-addr* | *addr:addr* | *addr.length* | 0]

Diagram

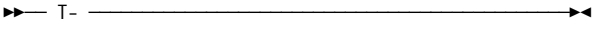


T- (Instruction trace off)

Descriptive

T-

Diagram

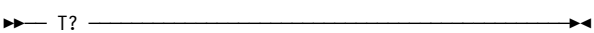


T? (Instruction trace query)

Descriptive

T?

Diagram

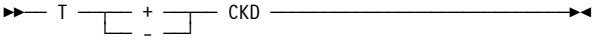


T{+/-} CKD (Turn CKD_KEY tracing on or off)

Descriptive

T{+ | -}CKD

Diagram

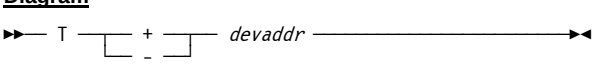


T{+/-} dev (Turn CCW tracing on or off)

Descriptive

T{+ | -}*devaddr*

Diagram

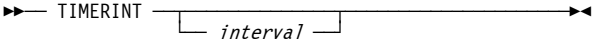


TIMERINT (Display or set timers update interval)

Descriptive

TIMERINT [*interval*]

Diagram

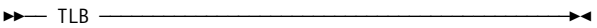


TLB (Display TLB tables)

Descriptive

TLB

Diagram

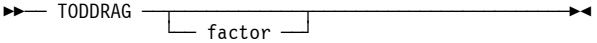


TODDRAG (Display or set TOD clock drag factor)

Descriptive

TODDRAG [*factor*]

Diagram



TRACEOPT (Instruction trace display options)

Descriptive

TRACEOPT [TRADITIONAL | REGSFIRST | NOREGS]

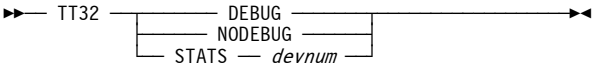
Diagram

TT32 (Control / query CTCI-WIN functionality)

Descriptive

TT32 {DEBUG | NODEBUG | STATS *devnum*}

Diagram

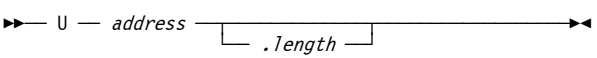


U (Disassemble storage)

Descriptive

U *address* [*.length*]

Diagram

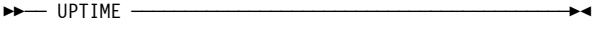


UPTIME (Display Hercules Emulator uptime)

Descriptive

UPTIME

Diagram

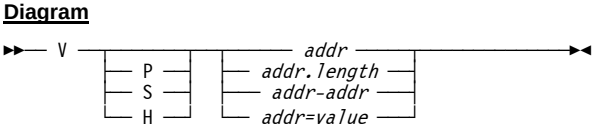


V (Display or alter virtual storage)

Descriptive

V [P | S | H] {*addr* | *addr.length* | *addr-addr* |
addr=value}

Diagram

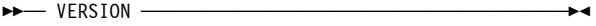


VERSION (Display version information)

Descriptive

VERSION

Diagram



7. Hercules Utilities

DASD Utilities

Utility Name	Function
CCKDCDSK	CCKD DASD file integrity verification, recovery and repair utility
CCKDCOMP	CCKD DASD file compression utility
CCKDDIAG	CCKD DASD file diagnostics utility
CCKDSWAP	CCKD DASD file swap-endian program
CKD2CCKD	Copy CKD DASD file to CCKD DASD file
CCKD2CKD	Copy CCKD DASD file to CKD DASD file
DASDCAT	Display PDS datasets and members
DASDCONV	DASD image file conversion program
DASDCOPY	Copy DASD file to another DASD file
DASDINIT	DASD image file creation
DASDISUP	Fix XCTL tables in SVCLIB
DASDLOAD	DASD loader program
DASDLS	List datasets on a volume
DASDPDSU	PDS unload utility
DASDSEQ	Display sequential datasets

Table 7: DASD Utilities

TAPE Utilities

Utility Name	Function
HETGET	Extract files from an AWS or HET tape file
HETINIT	Initialize an AWS or HET tape file
HETMAP	Show information about a HET or AWS tape file
HETUPD	Update and/or copy an AWS or HET tape file
TAPECOPY	Copy a SCSI tape to or from an AWSTAPE disk file
TAPEMAP	Show information about an AWS tape file
TAPESPLT	Split an AWS tape file

Table 8: TAPE Utilities

Miscellanious Utilities

Utility Name	Function
DMAP2HRC	P/390 DEVMAP conversion program

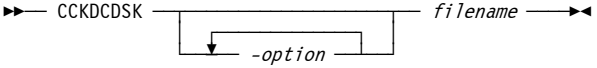
Table 9: Miscellanious Utilities

CCKDCDSK (CCKD DASD file integrity verification, recovery and repair utility)

Descriptive

CCKDCDSK [*-option* [*-option* ...]] *filename*

Diagram



Options

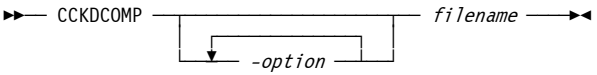
```
-v      (display version info and exit)
-f      (force check even if OPENED bit is on)
-ro     (open file read-only, no repairs)
-level (level of checking, 1-4)
```

CCKDCOMP (CCKD DASD file compression utility)

Descriptive

CCKDCOMP [*-option* [*-option* ...]] *filename*

Diagram



Options

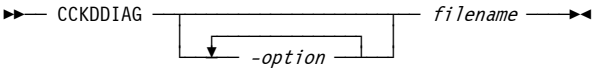
```
-v      (display version info and exit)
-f      (force check even if OPENED bit is on)
-level (level of checking, 1-4
```

CCKDDIAG (CCKD DASD file diagnostics utility)

Descriptive

CCKDDIAG [*-option* [*-option* ...]] *filename*

Diagram



Options

-v (display version info and exit)

-d (display DEVHDR)

-c (display CDEVHDR)

-1 (display L1TAB [l = numeric one])

-g (enable debug output)

CKD track related options:

-a *cc hh* (display absolute CCHH data)

-r *tt* (display relative TT data)

-2 (display L2TAB related to –a or –r)

-t (display track data)

-x (hex display track / key data)

-o *oo ll* (hex display data at offset oo of length ll)

CCKDSWAP (CCKD DASD file swap-endian program)

Descriptive

CCKDSWAP *filename*

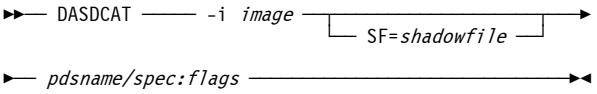
Diagram

DASDCAT (Display PDS datasets and members)

Descriptive

DASDCAT -i *image* [SF=*shadowfile*] *pdsname*|*spec:flags*

Diagram

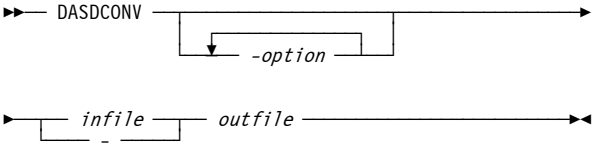


DASDCONV (DASD image file conversion program)

Descriptive

DASDCONV [*-option* [*-option* ...]] {*infile* | -} *outfile*

Diagram



Options

-r (replace output file)

-lfs (create single file even if > 2GB)

-q (quiet option, suppress progress messages)

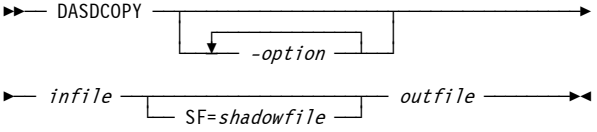
DASDCOPY (Copy DASD file to another DASD file)

Descriptive

DASDCOPY [*-option* [*-option* ...]] *infile*

[SF=*shadowfile*] *outfile*

Diagram



Options

```
-v      (display version info and help text)
-h      (display help text and quit)
-q      (quiet mode, suppress status)
-r      (replace output file)
-z      (compress using zlib (default))
-bz2    (compress using bzip2)
-0      (do not compress output [0 = zero])
-blks n (size of output FBA file)
-cyls n (size of output CKD file)
-a      (create output CKD file with alternate
         cylinders)
-lfs    (create single file even if > 2GB)
-o type (output file type: CKD, CCKD, FBA,
         CFBA)
```

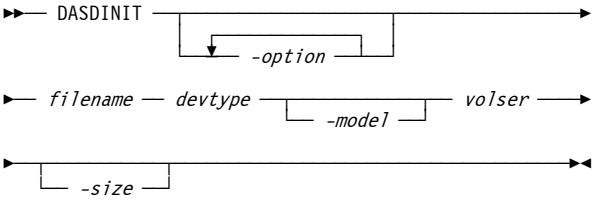
DASDINIT (DASD image file creation)

Descriptive

DASDINIT [*-option* [*-option* ...]] *filename*

devtype[*-model*] *volser* [*size*]

Diagram



Options

```
-v     (display version info and help text)
-z     (build compressed DASD using zlib)
-bz2   (build compressed DASD usng bzip2)
-0     (build image file with no compression
       [0 = zero])
-lfs   (create single file even if > 2GB)
```

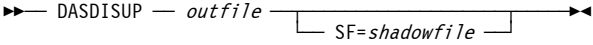
```
-a     (include alternate cylinders)
-r     (build raw DASD image file)
-linux (null track images will look like linux
        DASDFMT'ed images)
```

DASDISUP (Fix XCTL tables in SVCLIB)

Descriptive

DASDISUP *outfile* [SF=*shadowfile*]

Diagram



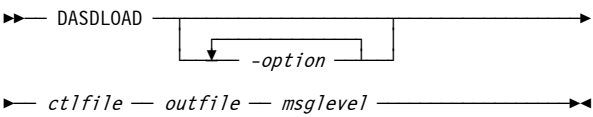
DASDLOAD (DASD loader program)

Descriptive

DASDLOAD [*-option* [*-option* ...]]

ctlfile outfile msglevel

Diagram



Options

```
-z   (compress using zlib)
-bz2 (compress using bzip2)
-0   (do not compress output [0 = zero])
-lfs (create single file even if > 2GB)
-a   (include alternate cylinders)
```

Control File

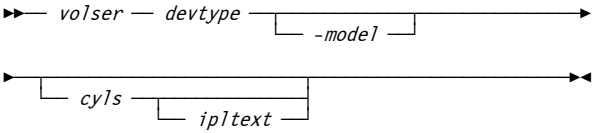
The control file is an ASCII text file consisting of a volume statement followed by one dataset statement for each dataset to be created.

Volume Statement

Descriptive

volser devtype[*-model*] [*cyls* [*ipltext*]]

Diagram



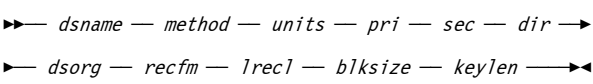
Dataset Statement

Descriptive

dsname method units pri sec dir dsorg recfm lrecl ...

... *blksize keylen*

Diagram



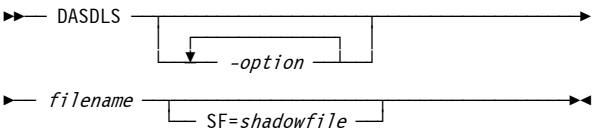
DASDLS (List datasets on a volume)

Descriptive

DASDLS [*-option* [*-option* ...]]

filename [SF=*shadowfile*]

Diagram



Options

```
-info       (Show Format 1 DSCB information)
-caldt      (Display dates as YYYYMMMDD)
-refdt      (Display last-referenced date)
-expdt      (Display expiry date)
```

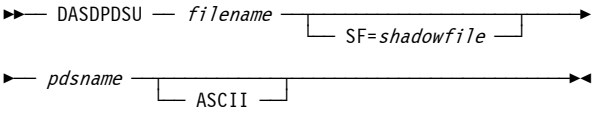
```
-hdr         (Display column headers)

-dsnl[=n]    (Reserve space for dataset names
              up to n characters)

-yroffs[=n] (Add the year offset n to dates
             before displaying them)
```

DASDPDSU (PDS unload utility)

Descriptive

DASDPDSU *filename* [SF=*shadowfile*] *pdsname* [ASCII]

Diagram



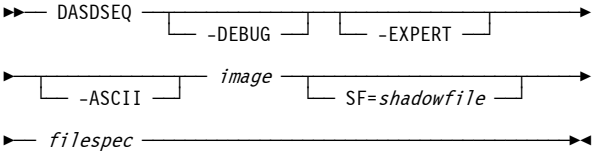
DASDSEQ (Display sequential datasets)

Descriptive

DASDSEQ [-DEBUG] [-EXPERT] [-ASCII] *image*

[SF=*shadowfile*] *filespec*

Diagram

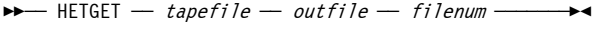


HETGET (Extract files from an AWS or HET tape file)

Descriptive

HETGET *tapefile outfile filenum*

Diagram

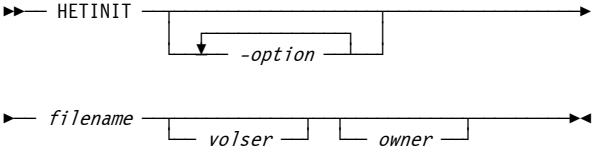


HETINIT (Initialize an AWS or HET tape file)

Descriptive

HETINIT [*-option* [*-option* ...]] *filename*
[*volser*] [*owner*]

Diagram



Options

-d (disable compression, create AWSTAPE file)

-h (display usage summary)

-i (create IEHINITT formatted tape, default)

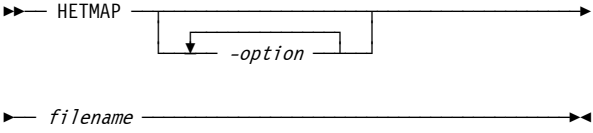
-n (create NL (non labeled) tape

HETMAP (Show information about a HET or AWS tape file)

Descriptive

HETMAP [*-option* [*-option* ...]] *filename*

Diagram



Options

-a (print all label and file information, default)

-d (print only dataset information)

-f (print only file information)

-h (display usage summary)

-l (print only label information)

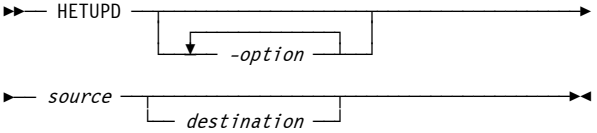
-t (print TAPEMAP-compatible format output)

HETUPD (Update and/or copy an AWS or HET tape file)

Descriptive

HETUPD [*-option* [*-option* ...]] *source* [*destination*]

Diagram



Options

-1...9 (compression level (1=fast, 9=best))

-b (use bzlib compression)

-c *n* (set chunk size to n)

-d (decompress source tape file)

-h (display usage summary)

-r (rechunk tape file)

-s (strict AWSTAPE specification)

-v (verbose information)

-z (use zlib compression)

TAPECOPY (Copy a SCSI tape to or from an AWSTAPE disk file)

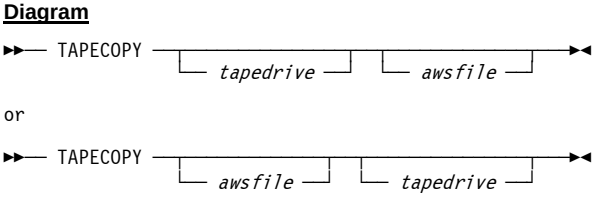
Descriptive

TAPECOPY [*tapedrive*] [*awsfile*]

or

TAPECOPY [*awsfile*] [*tapedrive*]

Diagram

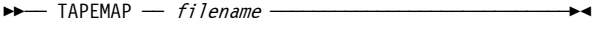


TAPEMAP (Show information about an AWS tape file)

Descriptive

TAPEMAP *filename*

Diagram

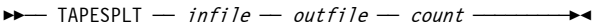


TAPESPLT (Split an AWS tape file)

Descriptive

TAPESPLT *infile outfile count*

Diagram



DMAP2HRC (P/390 DEVMAP conversion program)

Descriptive

DMAP2HRC *filename*

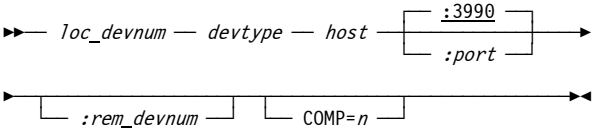
Diagram

8. Shared Device Support

Descriptive

loc_devnum devtype host[*:port*] [*:rem_devnum*] [COMP=*n*]

Diagram



9. Hercules 3270 Logo

Set Buffer Address

Set Buffer Address to row x and column y.

@SBA *x,y*

Set Field

Set Field to highlight ("H") and/or protected ("P").

@SF {H | P | HP }

New Line

Force a skip to a new line.

@NL

Align

Specify text alignment.

@ALIGN {NONE | LEFT | RIGHT | CENTER }

Variables

$(VERSION)
The Hercules version.

$(HOSTNAME)
The host name, on which Hercules is running.

$(HOSTOS)
The host operating system.

$(HOSTOSREL)
The release of the host operating system.

$(HOSTOSVER)
The version of the host operating system.

$(HOSTARCH)
The host architecture.

$(HOSTNUMCPUS)
The number of host CPUs. UP (Uniprocessor for one CPU), or MP=n (Multiprocessor for more than one CPUs).

$(LPARNAME)
The LPAR name specified in the configuration file.

$(CSS)
The logical channel subsystem set or channel set for the terminal.

$(SUBCHAN)
The subchannel number for the terminal.

$(CCUU), $(ccuu), $(CUU), $(cuu)
Various forms of the device number of the terminal.

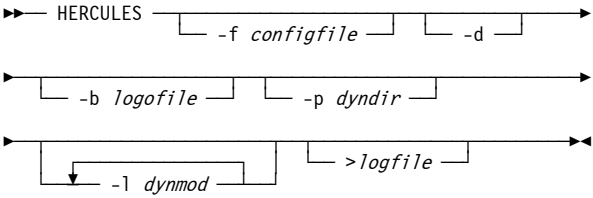
10. Starting the Hercules Emulator

Starting Hercules in Native Mode

Descriptive

HERCULES [-f *configfile*] [-d] [-b *logofile*] [-p *dyndir*]
[[-l *dynmod*] ...] [>*logfile*]

Diagram

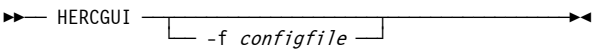


Starting Hercules with the Windows GUI

Descriptive

HERCGUI [-f *configfile*]

Diagram

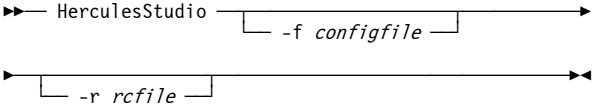


Starting Hercules with the Hercules Studio

Descriptive

HerculesStudio [-f *configfile*] [-r *rcfile*]

Diagram



11. Using the keyboard

Normal cursor handling

The normal cursor handling is available on all platforms (Windows and Unix).

Key	Action
Esc	Erases the contents of the command input area. If the command input area is already empty, switches to semi-graphical New Panel.
Del	Deletes the character at the cursor position.
Backspace	Erases the previous character.
Insert	Toggles between insert mode and overlay mode.
Tab	Attempts to complete the partial file name at the cursor position in the command input area. If more than one possible file exists, a list of matching file names is displayed.
Home	Moves the cursor to the start of the input in the command input area. If the command input area is empty, scrolls the message area to the top.
End	Moves the cursor to the start of the input in the command input area. If the command input area is empty, scrolls the message area to the bottom.
Page Up	Scrolls the message area up one screen.
Page Down	Scrolls the message area down one screen.
Up arrow	Recalls the previous command into the input area.

Key	Action
Down arrow	Recalls the next command into the input area.
Right arrow	Moves cursor to the next character of the input area.
Left arrow	Moves cursor to the previous character of the input area.
Ctrl + Up arrow	Scrolls the message area up one line.
Ctrl + Down arrow	Scrolls the message area down one line.
Ctrl + Home	Scrolls the message area to the top.
Ctrl + End	Scrolls the message area to the bottom.

Table 10: Normal cursor handling

Extended cursor handling

The following additional keyboard functions are effective when the Hercules Extended Cursor Handling feature is activated at compile time. At present, this feature is activated on the Windows platform only.

Key	Action
Alt + Up arrow	Moves cursor up one row.
Alt + Down arrow	Moves cursor down one row.
Alt + Right arrow	Moves cursor right one column.
Alt + Left arrow	Moves cursor left one column.
Tab	If the cursor is outside the command input area, moves cursor to the start of the input in the command input area. Otherwise behaves like as described in the previous table.

Key	Action
Home	If the cursor is outside the command input area, moves cursor to the start of the input in the command input area. Otherwise behaves like as described in the previous table.
End	If the cursor is outside the command input area, moves cursor to the end of the input in the command input area. Otherwise behaves like as described in the previous table.

Table 11: Extended cursor handling

Appendix A: Supported DASD Device Types

The symbol "[*]" in the size column means that any size can be specified, else the size defaults to the first listed model.

CKD Devices

Devicetype-Model	Cylinders	Alternate Cylinders
IBM 2311	[*]	
IBM 2311-1	200	2
IBM 2314	[*]	
IBM 2314	200	3
IBM 3330	[*]	
IBM 3330-1	404	7
IBM 3330-2	808	7
IBM 3330-11	808	7
IBM 3340	[*]	
IBM 3340-1	348	1
IBM 3340-35	348	1
IBM 3340-2	696	2
IBM 3340-70	696	2
IBM 3350	[*]	
IBM 3350-1	555	5
IBM 3375	[*]	
IBM 3375-1	959	1
IBM 3380	[*]	
IBM 3380-1	885	1

Devicetype-Model	Cylinders	Alternate Cylinders
IBM 3380-A	885	1
IBM 3380-B	885	1
IBM 3380-D	885	1
IBM 3380-J	885	1
IBM 3380-2	1770	2
IBM 3380-E	1770	2
IBM 3380-3	2665	3
IBM 3380-K	2665	3
EMC 3380 K+	3339	3
EMC 3380 K++	3993	3
IBM 3390	[*]	1
IBM 3390-1	1113	1
IBM 3390-2	2226	2
IBM 3390-3	3339	1
IBM 3390-9	10017	3
IBM 3390-27	32760	3
IBM 3390-54	65520	3
IBM 9345	[*]	
IBM 9345-1	1440	0
IBM 9345-2	2156	0

Table 12: Supported CKD DASD Devices

FBA Devices

Devicetype-Model	Blocks
IBM 3310	[*]
IBM 3310-1	125664
IBM 3370	[*]
IBM 3370-A1	558000
IBM 3370-B1	558000
IBM 3370-A2	712752
IBM 3370-B2	712752
IBM 9313	[*]
IBM 9313-1	246240
IBM 9332	[*]
IBM 9332-200	360036
IBM 9332-400	360036
IBM 9336-600	554800
IBM 9335	[*]
IBM 9335-1	804714
IBM 9336	[*]
IBM 9336-10	920115
IBM 9336-20	1672881
IBM 9336-25	1672881
IBM 0671-08	513072
IBM 0671	574560
IBM 0671-04	624456

Table 13: Supported FBA DASD Devices

Appendix B. Syntax

This book uses two kinds of describing the syntax of configuration statements, console commands and utilities.These are syntax descriptions and syntax diagrams.

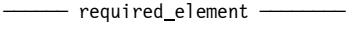
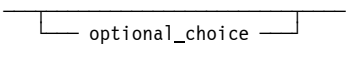
B1. Reading Syntax Descriptions

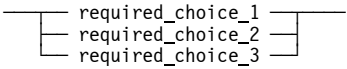
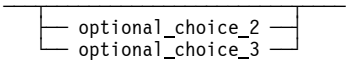
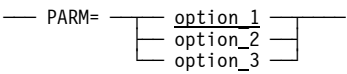
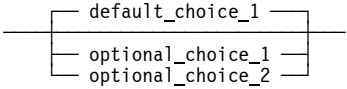
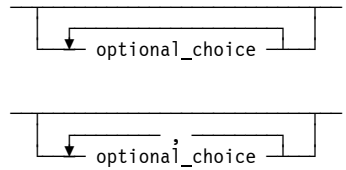
KEYWORDS	Keywords are denoted with upper case letters. Obey the spelling. In the actual statements or commands they can be coded in upper case or lower case letters.
variables	All user defined values are denoted with lower case italic letters. In the actual statements or commands they can be coded in upper case or lower case letters.
{ }	Signifies that all, or some portion, of the code elements between the braces are required elements. Note that the braces are not part of the statements and must be not coded.
[ ]	Signifies that all, or some portion of the code elements between the square brackets can optionally appear but are not required elements. Note that the square brackets are not part of the statements and must be not coded.
|	The OR symbol signifies that you may use only one of the code elements or values from the possible choices. Note that the OR symbol is not part of the statements and must be not coded.

xxx ,…	Signifies that there can be more than one value in a comma delimited list. Note that the dots are not part of the statements and must be not coded.
xxx …	Signifies that there can be more than one value in a blank space delimited list. Note that the dots are not part of the statements and must be not coded.

Table 14: Reading Syntax Descriptions

B2. Reading Syntax Diagrams

	This symbol indicates the beginning of a statement.
	This symbol indicates the end of a statement.
	This symbol indicates that the statement is continued on the next line.
	This symbol indicates that the statement is a continuation from the previous line.
	A required element (keyword or variable) appears on the main path.
	An optional element (keyword or variable) appears below the main path.

	A required element (keyword or variable) with selection. Only one of the available options may be specified.
	Optional elements (keyword or variable) with selection are shown below the main line. Only one of the available options may be specified.
	A keyword with options. Only one of the available options may be specified. The underscored option is the default if the whole keyword statement is not coded.
	Optional elements (keyword or variable) with selection are shown below the main line. If one element is the default, it appears above the main line. Only one of the available options may be specified. If none of these elements is explicitly specified, the default above the main line is taken.
	This is an optional, repeatable element. Specifying several elements is allowed. A character within the arrow path means that repeated items have to be separated by that character. Otherwise the items are separated by a blank.

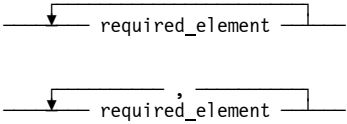
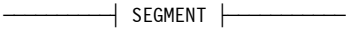
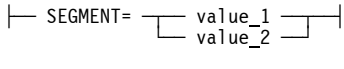
	This is a required, repeatable element. Specifying several elements is allowed. A character within the arrow path means that repeated items have to be separated by that character. Otherwise the items are separated by a blank.
	Reference to a syntax segment, which is described seperately.
	This symbol indicates a syntax segment which is referenced from the main syntax diagram.
KEYWORDS	Keywords are denoted with upper case letters. Obey the spelling. Lower case letters are optional and can be omitted (for example DISable). In the actual statements or commands they can be coded in upper case or lower case letters.
variables	All user defined values are denoted with lower case italic letters. They represent user supplied names or values. In the actual statements or commands they can be coded in upper case or lower case letters.

Table 15: Reading Syntax Diagrams

Hercules Emulator

Hercules System/370, ESA/390,
z/Architecture Emulator

Reference Summary

Version 3 Release 13

HERS031300-00