

J. STERKEN

MTS REFERENCE SUMMARY

U of M Computing Center, March 1975

MTS REFERENCE SUMMARY

U of M Computing Center, March 1975

NOTATION

Upper Case Bold Face	Shortest acceptable abbreviation
Underline	Default form
[]	Encloses optional fields
{ }	Encloses alternate forms
	Separates alternate forms
Ellipsis (. . .)	Preceding fields may be repeated

I/O Assignments

SCARDS=FDname (defaults to *SOURCE*)
SPRINT=FDname (defaults to *SINK*)
SPUNCH=FDname (defaults to *PUNCH*, batch only)
GUSER=FDname (defaults to *MSOURCE*)
SERCOM=FDname (defaults to *MSINK*)
0-19=FDname

System Prefixes

MTS command mode
? queries for error corrections
> LIST and COPY commands
• MTS program loader
: line file editor (\$EDIT)
+ Symbolic Debugging System (\$DEBUG)

News and Information Files

Use with \$COPY command:

*RATES Schedule of current rates for use of computer.
*CCHOURS Schedule of hours that CC and NUBS are open.

COMPUTING CENTER PHONE NUMBERS

370/168:	
Memorex 1270	763-0300
Data Concentrator	763-1500
Votrax	763-0590

COMPUTING CENTER:

Information	764-2121
Business Office	764-2121
Counseling	764-7118
Machine Room	764-2121
Machine Status	763-0420
Job Status	763-3360

NUBS:

Counseling	764-6350
Machine Room	764-7147
Job Status	764-9109

MTS Command Language

\$ACCOUNTING

\$ALTER location value ...

location GRx

FRx

[RF=hhhhhhGRx] xxxxxx

value {X' hhhh 'C' xxxx 'F' yyyy 'H' yyyy '}

\$CALC {expression/numbers}

\$CANCEL [*...*] [[JOB] nnnnnn]

[ID CCID]=xxxx [PW=yyyyyy]

where *...*= {PRINT}*PUNCH}*BATCH*}

\$COMMENT [text]

\$CONTROL FDname control-command

\$COPY [[FROM] FDname1] [[TO] FDname2]

\$CREATE filename [SIZE=nnPnT]

[TYPE=LINESEQ SEQWL]

[VOLUME=volume][MAXSIZE]=nnPnT]

\$DEBUG [objectFDname] [MAP [=mapFDname]]

[NOMAP] [XREF] [UXREF]

[I/OFDnames] [limits] [PAR=parameters]

\$DESTROY filename [{OK O.K.!}]

\$DISPLAY [ON FDname] [format] location ...

format {HEX NOHEX}

{MNEM NOMNEM}

{BCD EBCD NOBCD NOEBCD}

{SP1 SSPC SGLS SP2 DSPC DBLS}

{ORL=S ORL=L}

location GRx

FRx

[RF=hhhhhhGRx] xxxxxx[...xxxxx]

PSW

VMSIZE

{COST\$}

MAP

SIGFILE

\$DUMP [ON FDname] [SYS] [format]...

format {HEX NOHEX}

{MNEM NOMNEM}

{BCD EBCD NOBCD NOEBCD}

{SP1 SSPC SGLS SP2 DSPC DBLS}

{ORL=S ORL=L}

{LIB NOLIB}

\$EDIT [{filename}:edit-command]

\$EMPTY filename [{OK O.K.!}]

\$FILESTATUS [name] [format] [information]

\$GET FDname

\$LIST [FDname1] [[ON] FDname2]

\$LOAD [object FDname] [MAP [=mapFDname]]

[NOMAP] [XREF] [UXREF]

[I/OFDnames] [limits] [PAR=parameters]

(see \$RUN command)

\$LOCK filename [how] [options]

\$LSTATUS [{filename}[JOB] nnnnnn]

\$MODIFY location value ...

(see \$ALTER command)

\$MOUNT [request [:request]...]

\$NET [*pdn*] [network-command]

\$NUMBER [par]

par [starting-number] [,]increment]

CONTINUE

\$PERMIT filename [,] [accessinfo]

or

filename1 LIKE filename2 [EXCEPT accessinfo]

where: accessinfo=how [who] [,how [who]]...

\$RELEASE [{*pdn*}*PRINT}*PUNCH}*BATCH*}

\$RENAME filename1 [AS] filename2 [{OK O.K.!}]

\$RENUMBER filename [first [,] last [TO] beg [,] increment]

\$RESTART [[AT] location] [MAP [=mapFDname]]

[NOMAP] [XREF] [UXREF]

[I/OFDnames] [limits]

(see \$RUN command)

\$RUN [objectFDname] [MAP] [=mapFDname]]

[NOMAP] [XREF] [UXREF]

[I/OFDnames] [limits] [PAR=parameters]

limits TIME={t|tM}

PAGES=p

CARDS=c

{PLOTTIME|PT}={t|tM}

\$SDS [debug-command]

\$SET keyword ...

\$SIGNOFF [SHORT\$]

\$SIGNON ccid [keywords] ['comment']

keywords PW=password

TIME={t|tS|tM}

PAGES=p

CARDS=c

COPIES=n

PRINT={PN|TN}

ROUTE=station

PROUTE=station

CRUTE=station

{PLOTTIME|PT}={t|tM}

{S|SHORT|LONG}

\$SINK {FDname|PREVIOUS}

\$SOURCE {FDname|PREVIOUS}

\$START [[AT] location] [MAP [=mapFDname]]

[NOMAP] [XREF] [UXREF]

[I/OFDnames] [limits]

(see \$RUN command)

\$SYSTEMSTATUS [par]

pars QUEUE [receipt [ALL|LCL|rmt id|RMT n]

TASKS [tasks parameter]

SCREEN [ALL|LCL|rmt id|RMT n]

MCMD MTS command

STOP

\$TRUNCATE filename

\$UNLOAD

\$UNLK filename

\$UNNUMBER

\$SET Command Parameters

AFDECHO={ON|OFF} echo lines to *afd*

AUTOHOLD={ON|OFF} hold *PRINT*, *PUNCH*,
BATCH jobs

CASE={UC|LC|MX|MIXED} lower- and upper-case conversion

CMDSKIP={ON|OFF} page-skip (batch)

CONTCHAR=c MTS command continuation (initially —)

COPIES=n number copies of printed output

COST={ON|OFF} print cost after each command

CREAFD={ON|OFF} make created file the active file

CRUTE=station station for punched output

DEBUG={ON|OFF} debug for each run (load)

DEVCHAR=c device character (initially >)

ECHO={ON|OFF} echo MTS command lines

EDITAFD={ON|OFF} make edit file the active file

ENDFILE={ON|OFF|NEVER} recognize \$ENDFILE
delimiter

ERRMAP={ON|OFF} produce loader map on error (batch)

ERRORDUMP={ON|OFF|FULL} dump on error (batch)

FILECHAR=c file character (initially #)

IC={ON|OFF} implicit concatenation

LIBR={ON|OFF} search libraries

LIBSRCH={OFF|FDname} search library in FDname

LNS=c line-number separator (initially ,)

LSS={ON|OFF} limited-state service (initial state depends
on system load)

MAPDOTS={ON|OFF} dotted lines around loader map

PDMAP={ON|OFF} include predefined symbols in map

PFX={ON|OFF} print terminal prefix character

PRINT={PN|TN|ANY} print train specification

PRMAP={ON|OFF} include pseudo-register info. in map

PROUTE=station station for printed output

PW=chars user password

RF={hhhhh|GRx} global relocation factor (initially 0)

SCRFCHAR=c temporary-file character (initially —)

SEQCHK=ON OFF check indexed operation on seq. file

SHFSEP=c separator—CCID from filename (initially :)

SIGFILE=OFF FDname special file \$SOURCED to after
signon

SIGFILEATTN=ON OFF allows attentions to interrupt
SIGFILE-processing

SYMTAB=ON OFF retain loader symbol table

TDR=ON OFF print CPU-time and drum-reads for
each command

TERSE=ON OFF suppress/abbreviate info. and error
messages

TRIM=ON OFF trim trailing blanks (files only)

UNLOAD=ON OFF unload after normal execution

USMSG=ON OFF print loader undefined symbol
message

UXREF=ON OFF print loader cross-references to
undefined symbols (defaults ON in
batch; OFF on terminal)

XREF=ON OFF print loader cross-reference listing

*LIBRARY=ON OFF search *LIBRARY

-\$ COST =ON OFF print cost after each command

Symbolic Debugging System

Keyword Modifiers

@TYPE=ABCDEFHILMPSVWXYZ
type attribute

@LENGTH=n length attribute

@SCALE=n scale factor

@CSECT=cs control section name

@GEN=n generation of current control section

@DSECT=ds dsect name

Modifiers

@Q symbolic location

@R hex relative location

@A hex absolute (virtual) address

@X force hex conversion

@D force decimal conversion

SDS Command Language

ACTIVATE {name|FLOW|
CHANGES|REFERENCES}

ALTER symbol {value...}symbol

AT symbol... [:command]

ATTRIBUTE symbol...

BREAK symbol...

CLEAN [BREAK][AT][WHENS]
[FLOW][CHANGES][REFERENCES]

COMMENT [text]

CONTINUE [symbol...]

CSECT {section|n}*}

DEACTIVATE {name|FLOW|
CHANGES|REFERENCES}

DISPLAY symbol [...symbol] ...

DROP {section|symbol}...

DUMP [{PSW|GRS|FRS|section}...]

END

GOTO symbol [symbol ...]

HEXDISPLAY symbol [...symbol] ...

IF expression [:command]

IGNORE breakpoint-label {n|symbol}

LIST [BREAK][AT][WHENS][MODS]
[FLOW][CHANGES][REFERENCES]

MAP [{FULL|DSECT}]

MODIFY symbol {value...|symbol}

MTS [MTS command]

QUALIFY symbol...

RESET

RESTORE [{symbol|name}] ...

RUN [symbol...]

SCAN [{section|address1...address2*}] {value|symbol}

SDS

SET keyword-parameter...

STEP [n]

STOP

SYMBOL symbol...

TRACE {FLOW|CHANGES|REFERENCES} [symbol ...]

WHEN expression [;command]

USING section address

Keyword Parameters for SDS SET Command

AT={ON|OFF} at-point processing

ATPREFIX=c (init. %) at-insertion mode prefix char.

ATTN={ON|OFF} attention-interrupt processing

BLANK=chars (init. BLANK) symbol for blank common sections

BREAK={ON|OFF} breakpoint processing

DSECTS={ON|OFF} include duplicate dsects in symbol table

ECHO={ON|OFF} echo SDS commands

ENTRY=loc entry-point to user's program

ERRORDUMP={ON|OFF|FULL} dump on error (batch only)

FULLSCAN={ON|OFF} full scanning for SCAN command

FULLSIML={ON|OFF} simulate low-core library routines

INDCH=c (init. \$) indirection character

INPUT=FDname source for SDS commands

IS={67|70} (init. 70) simulator instruction set

LEN=n (init. 4) default length attribute

LLX={ON|OFF} include LINK, LOAD, XCTL calls in symbol table

Logical I/O Units assignments for user's program

MODCH=c (init. @) modifier character

OMAPCH=c (init. *) open-map character

OUTPUT=FDname SDS output lines

PAR=text parameter for user's program field

PGNT={ON|OFF} program interrupt processing

PRAREA=chars (init. PRAREA) symbol for pseudo-register area

PREFIX=c (init. +) SDS prefix character

RF=constant (init. 0) default relocation factor

SCALE=n (init. 0) default binary scale factor

SIML={ON|OFF} simulate user's program

TERSE={ON|OFF} SDS terse mode

TYPE=code (init. X) default type attribute

XFR={ON|OFF} intercept LINK, LOAD, XCTL, and UNLOAD calls

\$EDIT Mode

Command modifiers:

@A	apply throughout given line range
@PC	print column number of string
@CH @NCH	checkpointing
@L @NL	line-number prefixing
@V @NV	verification
@X @NX	hexadecimal conversion

String delimiters:

'" < > () , ? : ; % & | ~ _ ! # @ =

Special linenumbers:

*	current line
*F	first line of file
*L	last line of file

Linenummer parameters (lpar):

/regionname
/FILE
 linenummer [COUNT=n]
 linenummer1 linenummer2
 COUNT=n

Commands:

ALTER	lpar ['str1'str2']
BLANK	lpar ['str1']
CHANGE	lpar ['str1'str2']
CHECKPOINT	[OFF]
COLUMN	[m [n]]
COPY	lpar [TO [linenummer]]

DELETE	lpar
EDIT	filename
EXPLAIN	[-(command ERROR)-]
GOTO	label [[ON] condition]
INSERT	[linenummer][['str']
LINE	linenummer
MATCH	lpar ['str']
MTS	[command]
OVERLAY	lpar ['str']
PRINT	lpar [CHECK] or -(COLUMNS REGIONS XECS)- or \$name
REGION	/name [line1 [line2]]
RENUMBER	[linenummer [increment]]
REPLACE	lpar ['str']
RESTORE	lpar
SCAN	lpar ['str']
SET	keyword-parameter
SHIFT	lpar -(LEFT RIGHT)- count
STOP	
XEC	\$name
+n	
-n	
\$name	
/name	

\$FILESTATUS command

\$FILESTATUS [name] [format] [information]

name: [NAME=]{filename}*{ccid:}*}

format: [OUTFORM=]{COLUMNS|KEYWORD|
LABELLED|PACKED}

HEADING={ON|OFF} or {HEAD|NOHEAD}

OUTPUT=FDname or ON FDname

TERSE={ON|OFF} or {TERSE|VERBOSE}

information:

INFO=item or INFO=(item1,item2,...) or

item1 item2 ...

catalog items:

OWNER TYPE

VOLUME LOC

USECNT RPM

LASTREF IDLEDAYS

CREDATE

access items:

MYACCESS FULLACCESS

ACCESS

file items:

SIZE MAXLEN

MINISIZE HOLES

TRUNC MAXHOLE

LINES HOLESIZE

AVLEN MAXSIZE

other items:

NAME ALL

CATALOG TOTAL

FILE

3270 Device Commands

% is default device-command character

BLANK blank input region

COMMENT string comment

DCC=x device-command character

DC? display status

{DEQUEUE DQ}=n delete lines from input queue

DUPLEX={ON|OFF} duplex input

{EQ|MTQ} empty input queue

FAST FAST output mode

FLIP switch to other job

FOOTER output screen footer

GRAB initiate second signon

HEX={ON|OFF}[;x] hexadecimal input

HIST=n conversation history lines

JOBID task identification

K={UC|LC} input case conversion

LC lower case conversion

LINE LINE output mode

LNC={x|OFF} literal-next character

PAGE PAGE output mode

PFn=definition program function key definition

PF? display program function keys

QUEUE	display input queue
RATE =n	output speed (n=1-9)
RESET	reset to initial status
ROLL	ROLL output mode
TAB [={ON OFF}[;x] or [={ON OFF}[;x,]{A F P tablist}]	input tabs
TABO [={ON OFF}[;x] or [={ON OFF}[;x,]{A F P tablist}]	output tabs
TOP =[ON OFF]	carriage-control "1"
WAIT	inhibit time-out
{WB WF WR WL}[=n]	move window
WINDOW =n	display window n
?	combination DC? and PF?

Memorex 1270 Device Commands

% is default device command character

BDCST [={ON OFF}]	broadcast operator messages†
BLANK [=n]	blank input region
CC =[{ON OFF MODIFIER}]	carriage control function
CCDELETE [={ON OFF}]	carriage control character deletion†
CHARSET =ccc	character set selection
CRDELAY =m,b	carriage return delay
DATE	current date
DATETIME	current date and time
DCC [={“x” ON OFF}]	device-command character†
DLC [={“x” ON OFF}]	delete-line character†
DONT [={ON OFF}]	don't disconnect line after signoff†
DPC [={“x” ON OFF}]	delete-previous character†

DT	(see DATETIME)
EFC [={“x” ON OFF}]	end-of-file character†
GOLFBALL =ddd	character set selection
HEX [={“x” ON OFF}]	hexadecimal input†
HTDELAY =m,b	horizontal tab delay
JOB	task identification
LENGTH =n OFF	output line length
LMARGIN =n	left margin
LNC [={“x” ON OFF}]	literal-next character†
NOTE [={ON OFF}]	time-out notification†
PFX	(see PREFIX)
PLMARGIN =n	physical left margin
PREFIX =[{ON OFF MODIFIER}]	prefix function
PRMARGIN =n	physical right margin
PTABS [={ON OFF tablist}]	physical output tabs†
RESET	reset to initial status
REVERSE [={ON OFF}]	byte-reversal function†
RMARGIN =n	right margin
SNS	return sense information
TABIN [={“x” ON OFF tablist}]	input tab stops†
TABOUT [={“x” ON OFF tablist}]	output tab stops†
TD	(see TIMEDATE)
TERMINAL =cccc	terminal type
TERSE [={ON OFF}]	terse function†
TI	(see TABIN)
TIME	current time of day

†If no parameters are given, the state of the ON/OFF switch is reversed.

TIMEDATE	current time and date
UCI [= ON / OFF]-]	input upper-case conversion†
UCO [= ON / OFF]-]	output upper-case conversion†

Data Concentrator Device Commands (precede by 1 selection character)

ATTENTION	MTS attention interrupt
CHARSET = {ASCII TTY} -	input character set
CONTROL [MODE=mode] [ON=opts,...] [OFF=opts,...] [CLOCK=a] [SIZE=b] [DELAY=c,d]	
where mode is: BINARY, FULLDUPLEX, HALFDUPLEX, TAPE	
where opts is: BINARY, DUPLEX, ECHO, EDIT, EMERY, INTERLOCK, OVERFLOW, PARITY, QUEUE, READER, SPECIALECHO	
where a is: A (110 baud), B (134.5 baud), C (150 baud), D (300 baud)	
where b is: any integer in the range 1-255	
where c is: any integer in the range 0-255 (delay-after-tab 10-msec intervals)	
where d is: any integer in the range 0-255 (delay-after-return 10-msec intervals)	
ECHO *message	print message on terminal
FLIP	switch input to other job (after GRAB)
GRAB	initiate second signon (see FLIP)
HALT	terminate connection
HELLO	print time and DC control information
OPER message	print message on DC operator's console
PARAMETER [DCC=code] [ON=opts,...] [OFF=opts,...]	
where code is: a single alphabetic or special character	
where opts is: BROADCAST,PREFIX	

READER	start paper-tape reader
SENSE	display device status
STATUS	print system statistics
UCB	print unit control block

Data Concentrator MTS DSR Device Commands (precede by 2 selection characters)

BINLEN =n	binary input record length (1-32767)
BLANK [=n]	blank input region
CC = {ON OFF MODIFIER} -	carriage control
CCDELETE = {ON OFF} -	carriage control delete
CLEAR	reset parameters
DCC ="c"	device-command selection character
DON'T [= ON / OFF]-]	don't disconnect line after signoff
HEX =[ON / OFF] ["c"]	hexadecimal input
JOB	job status information
LABEL =string	label paper-tape
LEN =n	output line length
{LM RM} =n	left and right margins
PFX = {ON OFF MODIFIER} -	prefixing
RESET	reset parameters
SPACE	space output
TAB =[ON / OFF] ["x"] [tablist]	input tab stops
TERMINAL =cccc	terminal type
UCI = {ON OFF} -	input upper-case conversion
UCO = {ON OFF} -	output upper-case conversion

Terminal Control Characters

	TTY via Memorex	TTY via DC	IBM 2741
End-line	RETURN CNTL-S CNTL-Q	RETURN CNTL-S	RETURN
Del-line	CNTL-N	RUBOUT	—
Backspace	CNTL-H	CNTL-H	BKSP
Lit-next	CNTL-P	CNTL-P	!
Attention	BREAK	CNTL-E	ATTN
End-file	CNTL-C	CNTL-C	¢

\$MOUNT Command Parameters: MAG TAPES

Prototype \$MOUNT request:

{racknumber|POOL}- {7TP|9TP}- *pdn* [keywords] 'tape id'

Keywords:

{BLOCKING|BLK}- {ON|OFF}- enable or disable blocking

{DSNAME|DSN|NAME}-=name specify data set (file) name

DTCHK=- {ON|OFF}- expiration-date check

EXPDT=- {mm-dd-yy|mm/dd/yy}- set expiration date

{FORMAT|FMT|RECFM}-=fmt[(size)[,lrecl]]
set format, size, and LRECL

where fmt is {U|F|FBS|FB|V|VB|VS|VBS}

INIT=- {YES|NO}- initialize labeled tape

LP=- {ON|OFF}- enable or disable label processing

LRECL=n specify logical record length ($1 \leq n \leq 32767$)

MODE=mode specify tape mode

for 9-track tape: mode is {1600|800}-

for 7-track tape: mode is: {8|5|2}- {EN|ON|EF|OF|CV}-

POSN=- {*n*|*EOT*|name}- position tape

QUIT=- {YES|NO}- terminate batch job if mount fails

RETRY=n retry count for read errors ($0 \leq n \leq 15$)

RING=- {IN|OUT}- specify placement of file-protect ring

{SIZE|BLKSIZE}-=n maximum block size ($18 \leq n \leq 32767$)

{VOLUME|VOL|LABEL|VOLSER}-=name volume-name of
labeled tape

WRITE=- {YES|NO}- specify placement of file-protect ring

\$CONTROL Command Parameters: MAG TAPES

(grouped according to function)

Positioning:

FSR[=n] forward-space n records†

BSR[=n] backspace n records†

FSF[=n] forward-space n files†

BSF[=n] backspace n files†

POSN=- {*n*|*EOT*|name}- position tape

REW rewind tape to load point

Blocking:

{FORMAT|FMT|RECFM}-=fmt[(size)[,lrecl]]

{SIZE|BLKSIZE}-=n

LRECL=n

BLK=- {ON|OFF}-

Label-processing:

{DSN|NAME}-=[name]

DTCHK=- {ON|OFF}-

EXPDT=- {mm-dd-yy|mm/dd/yy}-

INIT

† $0 \leq n \leq 32767$ and defaults to 1 if omitted.

LP={ON|OFF}

Error-recovery:

RETRY=n

Miscellaneous:

WTM|EOF|=[n] write n tape marks†

MODE=mode set mode

PUSH push tape parameters onto stack

POP pop tape parameters from stack

\$MOUNT Command Parameter: MERIT Computer Network

Prototype \$MOUNT request: MNET *pdn* [keyword]

Keyword:

DEST|D|={UM|WS|MS} destination of connection

\$MOUNT Command Parameters: Paper-Tape Punch

Prototype \$MOUNT request:

PTPP *pdn* [keyword parameters]

Keywords:

FEET=n maximum length of tape to be punched;
1 ≤ n ≤ 900; defaults to 60

QUIT={YES|NO} terminate batch job if mount fails

TAPE={FANFOLD|REEL} which tape punch to use

\$MOUNT Command Parameters: Paper-Tape Reader

Prototype \$MOUNT request:

racknumber PTPR *pdn* [keyword parameters] 'tape id'

Keywords:

DELETE|RUBOUT|DELETE|ROD|={ON|OFF}
delete rubouts

EOR=nxx... define end-of-record sequence;
1 ≤ n ≤ 8; defaults to 18D

NULLDELETE|ND|={ON|OFF} delete null frames

PARITY={ODD|EVEN|NONE} control parity-checking

QUIT={YES|NO} terminate batch job if mount fails

SIZE=n define maximum record length;
1 ≤ n ≤ 32767; defaults to 255

SUPPRESS={ON|OFF} suppress channel 8

TRACKS={5|6|7|8} number of tracks (channels) on tape

I/O Modifiers

	(decimal)	(hex)
S sequential	1	00000001
I indexed	2	00000002
EBCD ebcidic translation	4	00000004
BIN binary format	8	00000008
LC no conversion to upper case	16	00000010
UC conversion to upper case	32	00000020
NOCC no carriage-control	64	00000040
CC logical carriage-control	128	00000080
¬PFX no line-number prefix	256	00000100
PFX line-number prefix	512	00000200
¬PEEL no line-number peeling	1024	00000400
PEEL peel line-numbers	2048	00000800
¬MCC no machine carriage-control	4096	00001000
MCC machine carriage-control	8192	00002000
¬TRIM don't trim blanks	16384	00004000
TRIM trim trailing blanks	32768	00008000

<u>→SP</u>	65536	00010000
SP special (device-dependent)	131072	00020000
<u>→IC</u> no implicit concatenation	262144	00040000
IC implicit concatenation	524288	00080000
<u>FWD</u> sequential forwards	1048576	00100000
BKWD sequential backwards	2097152	00200000
NOATTN attentions left pending	536870912	20000000
ERRRTN error return	1073741824	40000000
NOTIFY notify on I/O call	—2147483648	80000000

Suggestions for improvement may be directed to:
 U of M Computing Center
 Publications Office
 1075 Beal Avenue
 North Campus
 Ann Arbor, MI 48105



