M21 Utilities

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Chapter 1. M21 Utilities

The M21 Utilities themselves occupy the namespace **Mu** , that is to say that all M21 library routine utilities start with the characters **%Mu** and all M21 system utilities start with the characters **Mu** . In addition, when the system is installed, various vectors are installed for compatibility with DSM, ISM and MSM. These vectors are just stub routines which call the "real" M21 utilities and are installed in both upper and lower case versions.

The following table lists both M21 utilities and calling vectors:

Table 1-1.

Routine Name	Description	Comment
%ACTJOB or %actjob	Sets variables %ACTIVE and %ACTIVE0	Calls %MuStat to determine active jobs (via %MuUtil)
%D or %d	Displays current date	Calls %MuDate via %MuUtil
%DEBUG or %debug	Debug utility	Calls %MuDbg
%E or %e	Routine editor using unix vi editor	Calls %MuRvi via %MuUtil
%ER or %er	Error reporting	Calls %MuErr via %MuUtil
%ET	Error trap	Calls %MuErr1
%FL or %fl	First line list	Calls %MuRou for ro selection and then aga for first line list (via %MuUtil)
%G or %g	Global utilities	Calls %MuGlo via %MuUtil
%GCH or %cgh	Global characteristics	Calls %MuGlo for gl selection and then %MuGloM to set characteristics (via %MuUtil)
%GCOPY or %gcopy	Global copy	Calls %MuGlo for gl selection and then aga for global copy (via %MuUtil)
%GD or %gd	Global directory	Calls %MuGlo for gl directory (via %MuU
%GDE or %gde	Extended global directory	Calls %MuGlo for gl selection and then %MuGloM to display details (via %MuUtil)

Routine Name	Description	Comment
%GDEL or %gdel	Global delete	Calls %MuGlo for gl selection and then aga for global deletion (vi %MuUtil)
%GDISP or %gdisp	Extended Global Directory	Same as %GDE
%GE or %ge	Global size and efficiency	Calls %MuGlo for gl selection and then %MuGloS to display details (via %MuUtil)
%GED or %ged	Global editor	Calls %MuGlo for gl selection and then aga for global edit (via %MuUtil)
%GEDIT or %gedit	Global editor	Same as %GED
%GI or %gi	Global Input	Same as %GR
%GL or %gl	Global lister	Calls %MuGlo for gl selection and then aga for global list (via %MuUtil)
%GM or %gm	Global management utilities	Calls %MuGloM via %MuUtil
%GO or %go	Global output	Same as %GS
%GR or %gr	Global restore	Calls %MuGlo for res (via %MuUtil)
%GS or %gs	Global save	Calls %MuGlo for gl selection and then aga for global save (via %MuUtil)
%GSE or %gse	Global search	Calls %MuGlo for gl selection and then aga for global search (via %MuUtil)
%GSEL or %gsel	Global selector	Calls %MuGlo for gl selection and stores selection in ^UTILITY %MuUtil)
%GSIZE or %gsize	Global size	Calls %MuGlo for gl selection and then %MuGloS to display details (via %MuUtil)

Routine Name	Description	Comment
%HL	Dummy program	Line label entries of I and HIGH (under MS high and low prioritie Calls %MuUtil and ju quits
%HOSTCMD or %hostcmd	Host command interface	Call as $$TERMINAI $$JOBWAIT or $$JOB Calls %MuUtil and us the **$ZHOST** function perform the UNIX command passed as a parameter. $$TERMIN displays any output f the command to the s and is only valid in a foreground job. $$JOBWAIT does not display any output fr the command. $$JOB the command in background and retu the UNIXPID.
%J, %j, %JOB, %job, %JOBEXAM, %jobexam, JOBEXAM (in MGR)or jobexam (in MGR)	Examine job variables	Calls %MuEJob via %MuUtil
%KILLJOB or %killjob	Kill jobs	Calls %MuKJob via %MuUtil
%L, %l, %LOCKTAB or %locktab	Lock table display	Calls %MuLock via %MuUtil
%LOGON or %logon	User logon	Calls %MuLogon
%LU or %lu	Lock table display for current UCI	Calls ListU^%MuLoc %MuUtil
%MuAPI*	M21 API	API server started by $$Server^%MuAPI1(where %MuID is the ID (default="Default" %MuLog is a flag (0 o indicate whether to lo activity or not (defaul

Routine Name	Description	Comment
%MuConv	Number conversion utility	$$Bin(%MuVal,%Mu converts 1-36 digit bi value. $$Dec(%MuVal,%Mu converts decimal 0 - 68719476735. $$Hex(%MuVal,%Mu converts 1-9 digit hexadecimal value. $$Oct(%MuVal,%Mul converts 1-12 digit oc value. $$Conv(%MuVal,%M converts value of type "D", "H" or "O". Retur formatted values or n input value is invalid %MuVal is the value i appropriate format, %MuFmt is the forma use ("BIN", "DEC", "H or "OCT") with a defa "DEC" for type "H" ar default of "HEX" for t "D".
%MuDSK	Disk space utility	D ^%MuDSK displa disk space details

Routine Name	Description	Comment
%MuDate	Date utility	D ^%MuDate displa current date. $$Vali- date(%MuVal,%MuU returns the number o since 31/12/1840 or r %MuVal is not valid. dates are in the range 31/12/1840 to 31/12/ (0 - 94598). After strip leading and trailing s from %MuVal the following formats are allowed:- Relative Date=["N"] or ["T"] th or - {nnnn}]. I.e. curre day or + or - 0 to 9999 days from the current Absolute date=dDMM or dDMMCCYY or, a changing the first occurrence of a valid three characters of a m to " "MM" ", *dD*mM or *dD*mM*CCYY* w * is any none numeric string. mM or MM mu in the range 1 to 12. d must be valid for mon and year. Leap years a when CCYY is divisib 4 except for 1900 If +%MuUS is 0 then da month are reversed. $$SHConv(%MuVal,% returns formatted dat null if %MuVal is not range 0 - 94598 (i.e. 31/12/1840 to 31/12/2099). %MuVa the date in days since 31/12/1840, %MuFm the format to use (def is CCYYMMDD).whe dD=Day of month wi leading 0, DD=Day of month with leading 0 Day=Day of week wit capital first letter, day=First three letters day of week with cap first letter, DAY=First letters of day of week capitals, mM=Month year without leading MM=Month of year w leading 0, Mon=Mont name with capital firs letter, mon=First three letters of month with capital first letter,

Routine Name	Description	Comment
%MuDbg	Debug utility	D ^%MuDbg allows interactive debugging routine. The option to 'Control Device for an job' uses device 9070 a range of {maxjobs} po starting from ^Mu("Dbg","Port") (d of 58000).

Routine Name	Description	Comment
%MuDev*	Device utility	$$File(%MuMode,%M opens a host file. %M is the file name; if no name is specified a Filename prompt is displayed for entry of filename. %MuMode how the file is to be opened, (R or r for Re or w for write, M or m Read/Write with defa R). %MuDlm is the re delimiter, which can b null string ("") for no terminator or any ASC character for that ASC character as the delim The default is line fee ($c(10)) $$View(%Mu opens the view buffer using the specified tim out, and returns the v buffer device number null if the open failed %MuTo is null the op waits until it is succes and returns the view device number. If %M is an integer then the will try for up to %Mu seconds and if success will return the view b device number but if unsuccessful will retu null. If %MuTo is equ "W" the open will wai until it is successful, however 'Waiting for buffer' will be display which point the wait be interrupted. Any o values of .%MuTo wil try to open the view b

Routine Name	Description	Comment
%MuEJob*	Examine variables of a running M job	At the 'Job number to examine or Status' pr entry of S will display system status and retu the prompt, and entry valid job number will display the status for job along with the variables for the job.
%MuEdit*	Editing utility	Line(%MuP,%MuV,% is a line editor. %MuP the display prompt (non-mandatory). %M is the initial value (non-mandatory). %M the last character posi on the screen to be us (default of 78). %MuV is the maximum lengt the input data (defaul 1023 on M21 and any greater than 1023 is reduced to 1023). %M are input flags. 'o' indicates overtype mo on entry to the editor, indicates that the opti toggle between insert overtype mode (or vice-versa) is not avai T allows a tab charact be entered into the da (displayed as {009}) a is a 'no history' flag.
%MuErr*	Error handler	D ^%MuErr allows t error logs to be interrogated.
%MuExt*	External routine calls	Calls external routine perform tasks for an external System Statu UCI Management, Job Examination, Job Terminate, KillJob and System Shutdown.

Routine Name	Description	Comment
%MuFGC*	Fast global copy	Copies whole globals across machines via a TCP/IP socket. $$Copy^%MuFGC("^ copies global %MuGl %MuUCI on the M sy specified by %MuIP. I IP address is entered a default of localhost is A DNS name can be u available. If no port number is specified, p 33000 is used. When t copy is complete, deta the number of nodes a number of bytes copie and the time taken are returned. By using a $Order on the global directory it is possible use this utility to tran all the globals in a UC without user interven

Routine Name	Description	Comment
%MuGlo*	Global utility	Select global(s) as a n (e.g. ABC), a range (e. AB-Sz) or a pattern (e AB?, AB*S, AB1??, *, ? ??, where ? matches a single character and * matches any number characters). The globa details can be precede cross UCI/System environment informa (e.g. |"UCI"|ABC, |"UCI","VOL"|ABC |"UCI,VOL"|ABC or ["UCI"]ABC ["UCI","VOL"]ABC ["UCI,VOL"]ABC Noc selection is available f any of the above form by adding '(' and optionally nodes sepa by ',' and/or a trailing Each node can be any number of 'from:to:condition' separated by 'SPACEs 'from' is an optional s point expression (e.g. @XYZ or $p($h,",",2)), an optional end point expression and 'condi is an optional conditio expression (e.g. %MuSub?3n1a). N.B. %MuSub is the curren subscript, %MuSub(1 %MuSub(%MuNc) ar subscripts 1 to subscr no. %MuNc, %MuGlo the current global noc %MuDF is the curren global node $DATA v and %MuData is the current global node d it exists).. Precede any the above by - to de-s The global selections remain active until th specifically deselected Selection examples : DM*(,"A":"CZ":$L(%M goes through all globa that begin DM with a st subscript and a 2 n subscript between "A "CZ" where the length the 2 nd subscript is g than 3 characters I(::%MuDF=1) gives a level nodes of ^I whe

Routine Name	Description	Comment
%MuGloM*	Global management utility	Select global(s) as for %MuGlo with the following options available: ^quit Quits %MuGlo ^Help Displ help and toggles pron help level ^List Lists currently selected glo or node selections ^D Displays global direct of current UCI ^Set S global characteristics List extended global characteristics
%MuGloS*	Global sizing utility	Select global(s) as for %MuGlo with the following options available: ^quit Quits %MuGlo ^Help Displ help and toggles pron help level ^List Lists currently selected glo or node selections ^D Displays global direct of current UCI ^Size Global size in blocks a each level ^Esize Glo size and efficiency at level"
%MuGloT*	Global translation utility	Currently this utility loads the translation t entries identified by a manual set up.
%MuJrn*	Journal utility	This utility is used to access the journal files
%MuKJob*	Kill running M job	D ^%MuKJob allows to see a system status entering S. If a valid j number is entered yo be shown information about the job and ask you want to kill the jo you confirm that you to kill the job then the specified process will terminated.
%MuLock*	Lock utility	D ^%MuLock shows contents of the Lock T

Routine Name	Description	Comment
%MuLogon	M21 Logon	
%MuNet*	Networking	This is the server pro for servicing incomin external cross-system global and lock access and job requests.
%MuPGS*	Programmer shell	This is the programm shell utility.

Routine Name	Description	Comment
%MuRou*	Routine utility	Select routine(s) as a (e.g. ABC), a range (e. AB-Sz) or a pattern (e AB?, AB*S, AB1??, *, ? ??, where ? matches a single character and * matches any number characters). Precede a the above by - to de-s Any combination of a above can be entered separated by ',' or 'SPACE(s) '. The routi selections remain acti until they are specific deselected. The follov options are available ^quit Quits from rout selector ^Help Displa help and toggles pron help level ^List Lists currently selected rou names ^Dir Displays routine directory of U ^Flist Displays first li of selected routines ^Search Displays line selected routines mat search text ^COMpar Compares selected routines with another or routine append /b only display changes counts /Full to displa changes and counts /Statistics to only dis statistical counts ^Co Copies selected routi another UCI ^Delete Deletes selected routi ^SIze Displays size information of selecte routines ^SAve Saves selected routines to a File append /Noenco save without {NNN} encoding ^Restore Restores routines fron Host File append /Pc to restore pcode only without program text lowercase part is opti and input is case insensitive.

Routine Name	Description	Comment
%MuRvi*	Routine editor using vi	Editor using vi
%MuSrc*	Source utility	Select and process in same way as routines processed in %MuRo
%MuStat*	System status utility	D ^%MuStat gives d of all the current M21
%MuTime	Time utility	D ^%MuTime displa current time. Entry p for conversion
%MuTn*	Telnet utility	$$Tel-net^%MuTn(%MuHo sets up a telnet sessio the host identified via %MuHost (default of localhost) using port %MuPort (default of a 3 `rd` parameter of %MuScrpt is present the array (local or glo specified will be proc There is also an optio `th` parameter of %Mu which logs the input/output data to ^Mu("Tn","Log",$j) in MGR if %MuLog is non-zero.
%MuTrc*	Trace routine execution	Traces routine execut an external file stored the **dbname.%MuTrc** directory of where th database is placed. Th trace file will be name **UCI-SYS-JOB_NO**
%MuUCI	UCI utility	At the 'Change UCI t prompt enter a valid and an optional Volu and the partition is swapped into the spe UCI/VOL. Entry can name or number form An invalid entry will display a list of the U and Volumes on the system.
%MuUtil	Utility interface	Provides vectors for non-%MuRou utilitie

Routine Name	Description	Comment
%MuVCI*	VC/m Workstation Client Interface	This set of routines provides the client lin the interface between VC/m under M21 an MSM-Workstation.
%MuWCI*	Workstation client interface	This set of routines provides the client lin between M21 and MSM-Workstation. Th interface requires that sources rather than routines are edited.
%MuWSI*	Workstation server interface	This set of routines provides the server li the M21 and MSM-Workstation lin
%R or %r	Routine utilities	Calls %MuRou via %MuUtil
%RCMP or %rcmp	Routine Compare	Calls %MuRou for ro selection and then aga for routine copy (via %MuUtil)
%RCOPY or %rcopy	Routine copy	Calls %MuRou for ro selection and then aga for routine copy (via %MuUtil)
%RD or %rd	Routine directory	Calls %MuRou for ro directory (via %MuU
%RDEL or %rdel	Routine delete	Calls %MuRou for ro selection and then aga for routine delete (via %MuUtil)
%RELOAD or %reload	Routine reload	Reloads all routines i UCI. All processing w %MuUtil
%RESJOB or %resjob	Restore jobs	Calls %MuKJob via %MuUtil
%RFIND or %rfind	Routine Find	Calls %MuRou for ro selection and then aga for routine search (via %MuUtil)
%RFIRST or %rfirst	Routine First Line List	Calls %MuRou for ro selection and then aga for first line list (via %MuUtil)

Routine Name	Description	Comment
%RI or %ri	Routine Input	Calls %MuRou for re (via %MuUtil)
%RO or %ro	Routine Output	Calls %MuRou for ro selection and then aga for routine save (via %MuUtil)
%RR or %rr	Routine restore	Calls %MuRou for re (via %MuUtil)
%RS or %rs	Routine save	Calls %MuRou for ro selection and then aga for routine save (via %MuUtil)
%RSE or %rse	Routine search	Calls %MuRou for ro selection and then aga for routine search (via %MuUtil)
%RSEL or %rsel	Routine selector	Calls %MuRou for ro selection and stores selection in ^UTILITY %MuUtil)
%RSIZE or %rsize	Routine size utility	Calls Size^%MuRou %MuUtil
%S or %s	Source utilities	Calls %MuSrc via %MuUtil
%SP or %sp	Disk space utility	Calls %MuDSK via %MuUtil
%SS or %ss	System status utility	Calls %MuStat via %MuUtil. Displays in number order
%SSC or %ssc	Compact system status utility	Calls %MuStat via %MuUtil
%SSO or %sso	Old format system status utility	Calls %MuStat via %MuUtil
%SSQ or %ssq	Quick system status utility	Calls %MuStat via %MuUtil
%SSS or %sss	Short system status utility	Calls %MuStat via %MuUtil
%SST or %sst	System status utility	Calls %MuStat via %MuUtil. Displays m active jobs first
%SSTU or %sstu	System status utility for current UCI	Calls %MuStat via %MuUtil specifying t current UCI. Displays active jobs first

Routine Name	Description	Comment
%SSU or %ssu	System status utility for current UCI	Calls %MuStat via %MuUtil specifying t current UCI
%SSX or %ssx	External system status	'show jobs' comman within m21info (via %MuUtil and %MuEx
%T or %t	Displays current time	Calls %MuTime via %MuUtil
%U or %u	Change UCI utility	Calls %MuUCI via %MuUtil
BLKDMP or blkdmp	Block dump utility	Calls MuDBU via %MuUtil
DBFIX or dbfix	Database fix utility	Calls MuDBU via %MuUtil
JOBEXAM or jobexam	Examine job variables	Same call as %JOBEX
KILLJOB or killjob	Kill jobs	Same call as %KILLJ
LOCKTAB or locktab	Lock table display	Same call as %LOCK
MuDBU*	Database Block Utility	Database Block Utilit Allows block data to manipulated.
MuIPL*	Initial Program Load	Should be run after M startup. Processes according to system parameters.
MuRouE*	Sets up M.I.R.L editor	Load^MuRou(%MuI sets up the ^%MuRou global so that X ^%MuRouE invokes t M.I.R.L line editor. %MuInt can be 1 or 0, a default of 0. When %MuInt=1 the global up without any user interaction. With %MuInt=0 there is a u dialogue asking whet go OK to go ahead.

Routine Name	Description	Comment
MuVal*	Database Integrity Check	Asks which UCIs are validated (default of a and whether to enable ZTRACE. If a specific is identified then whe routines are to be vali and which globals are validated are requeste Following confirmatio go ahead the identifie routines and globals a validated and any err are displayed. If ZTRA was enabled then the details are displayed screen. Maps^MuVal a Map Block Integrity Check
RECOVLCK or recovlck	Recover lock table entries	Calls Recover%MuLo via %MuUtil
RESJOB or resjob	Restore jobs	Calls %MuKJob via %MuUtil
SSD or ssd	External system shutdown	'shutdown database' command within m21 (via %MuUtil and %MuExt)
UCIMGR or ucimgr	External UCI management	m21uci (via %MuUti %MuExt)
VALIDATE or validate	Database validation	Calls MuVal via %Mu
VERIFY or verify	Map block validation	Calls Maps^MuVal v %MuUtil

Table 1-2.

Version	Date	Comments
1.0	18/07/2000	Available as reference document
1.1	23/04/2001	Version Control secti added. Updated for additional utilities - % %SST, %L, %LU
1.2	17/04/2002	Reformatted
1.3	24/05/2002	Added new utilities
