4.7 Variables

Variables are divided into five groups:

(i) parameters which define some aspect of the instrument configuration but are not directly related to a motor angle or power supply value. These variables are changed by the SET command.

(ii) parameters which relate to the sample.These are also changed by SET.

(iii) limits and zeroes for motors and power supplies, also changed by SET.

(iv) Variables which are explicitly or implicitly related to a motor position or power supply value. These variables are changed by the DRive command.

(v) Increments (steps) for the variables of type (iv); these are changed by SET.

The following list gives the variable identifiers and definitions, where the order is as the variables are stored in the program.

 P.A Variables : Variables marked with an asterisk are not recognized unless THE Program is run in polarization analysis mode(see SWitch).

4.7.1   Instrument variables

```
DM  Monochromator d-spacing  [ ].
DA  Analyzer d-spacing  [ ].
SM Scattering sense at Mono  (+ve to the left)
SS Scattering sense at Sample  (+ve to the left)
SA  Scattering sense at Analyzer  (+ve to the left)
ALF1 Horizontal collimation before mono  [minutes FwHm]
ALF2 Horizontal collimation mono to sample [minutes FwHm]
ALF3 Horizontal collimation sample to anal.  [minutes FwHm]
ALF4 Horizontal collimation before detector  [minutes FwHm]
BET1 Vertical collimation before mono    [minutes FwHm]
```

```
BET2 Vertical collimation mono to sample   [minutes FwHm]
BET3 Vertical collimation sample to analyzer [minutes FwHm]
BET4 Vertical collimation before detector   [minutes FwHm]
ETAM Monochromator mosaic   [minutes FwHm]
ETAA Analyzer mosaic   [minutes FwHm]
FX  =1 for constant Ki; =2 for constant Kf
NP  Number of points in a scan
TI  Preset time [seconds] for a COunt or SCan
MN  Preset monitor for a COunt or SCan
TO  Time-out in for WAit command  [minutes]
DTL lower temperature error allowed   [Kelvin]
DTU upper temperature error allowed  [Kelvin]


*IF1V IF1V and IF2V are currents [Amps] in the vertical-field
*IF2V coils for Flipper 1 and Flipper 2.
*IF1H Horizontal-field currents are KI*IF1H for Flipper1 and
*IF2H KF*IF2H for F2.
*HELM  Angle between axis of Helmholtz pair one and KI.


remark:  ALF1 to ETAA are not used by MAD Program but stored for your own
convenience.
Please DO NOT FORGET to update ALF1-ALF4 variable after collimator
change to avoid confusion when you analyse your data after one or
two years!
```

4.7.2   Sample variables

```
AS  -\
BS    +--  Sample unit-cell edges [ ]
CS  -/


AA  -\
BB    +--  Sample unit-cell angles  [degrees]
CC  -/


ETAS Sample mosaic [minutes FwHm]


AX  -\
AY    +--  Components of a recip. lattice vector in scattering plane
AZ  -/       of the sample. A3 is the angle between KI and (AX,AY,AZ).


BX  -\
BY    +--  Components of a second distinct recip. lattice vector in
BZ  -/       the sample's scattering plane.
```

4.7.3 Limits and Zeros

Lower and upper limits and zeros for all variables given in (iv)
below. L, U and Z are appended as a prefix to the variable names to
indicate Lower limit, Upper limit and Zero.
Storage order is the same as for the corresponding variables, i.e. :
LA1, UA1, ZA1, LA2, UA2, ZA2, LA3 ...
(see (iv) below).

4.7.4 Targets and Positions

```
A1 Monochromator angle  (Bragg angle in degrees)
A2  Scattering angle at mono. (twice Bragg angle in degrees)
A3 Sample angle (degs)  (A3=0 when (AX,AY,AZ) is along KI)
A4 Scattering angle at sample  [degrees]
A5 Analyzer angle  (Bragg angle in deg, TOPSI: not used)
A6 Scattering angle at analyzer (twice A5 in deg.,   TOPSI: not used)

SINQ Instruments:
MCV Mono curvature vertical
SRS Sample table second ring
ACH Anal curvature horizontal
MTL Mono   lower translation
MTU Mono   upper translation
STL Sample lower translation
STU Sample upper translation
ATL Anal   lower translation
ATU Anal   upper translation
MGL Mono   lower goniometer (Reserved)
MGU Mono   upper goniometer
SGL Sample lower goniometer
SGU Sample upper goniometer
AGL Anal   lower goniometer (Reserved)
AGU Anal   upper goniometer
MSC Mono   "sample" changer (TASP only)
ASC Anal   "sample" changer (TASP only)
CSC Collimator "sample" changer (TASP only)

D1T D1B D1R D1L Diaphragm 1 (top/bottom/right/left)
D2T D2B D2R D2L Diaphragm 2 (top/bottom/right/left)
D3T D3B D3R D3L Diaphragm 3 (top/bottom/right/left)

ILL Instruments:
CH  Monochromator changer position  [degrees or mm]
```

```
TM (LM) Monochromator translation  [(IN20 : 5mm)]
GM Monochromator goniometer angle  [1 unit = 4 ]
RM Monochromator curvature
GL Sample goniometer angle; lower arc  [1 unit = 4 ]
GU  Sample goniometer angle; upper arc  [1 unit = 4 ]
TA  Analyzer translation  [ ? mm]
GA  Analyzer goniometer angle  [ .4degrees]
RA Analyzer curvature


EI  Incident neutron energy  [THz or meV]
KI  Incident neutron wavevector  [  -1]
EF  Final neutron energy  [THz or meV]
KF  Final neutron wavevector  [  -1]


QH  -\
QK    +--  Components of Q in Reciprocal Lattice Units [R.L.U.]
QL  -/


EN Energy transfer; +ve neutron energy loss  [THz or meV]
QM Length of Q  [  -1]
TT (T) Temperature of sample thermometer  [K]
TRT(RT) Temperature of regulation thermometer  [K]
   (can only be printed out)
*I1   -\
*I2     \
*I3    +--  power supply current values [A]
 .     /
*I11 -/


*HX   -\     Components of Helmholtz fields at sample in Oersteds.
*HY    +--  HX is parallel to Q and HY is perpendicular to Q in
*HZ  -/     the scattering plane.


*F1  -\     Status of flippers one and two; these variables take the
*F2  -/     values ON or OFF.
```

4.7.5   Increments Variables

For all variables A1 through T in the list of type (iv) variables
above, the identifier for the step used with a SCan command is obtained
by prefixing the variable name with the letter D.
Storage order is DA1, DA2, DA3....etc as for type (iv) variables above.