Mount Request:

```
ALL Bulk information
    Args: N/A
    Returns: [MOT] [RA] [DEC] [HA] [UT] [ALT] [AZ] [SECZ] [Epoch]
        MOT = (see MOTION)
        RA(Right Assention) = HH:MM:SS.ss
        DEC(Declination) = +DD:MM:SS.ss
        HA(Hour Angle) =  HH:MM:SS
        UT(Universal Time) = HH:MM:SS
        ALT(Elevation) = XXX.xx
        AZ(Azmouth) = XXX.xx
        SECZ(airmass) = XX.xx
        EPOCH = EEEE.e
AZ  Azmouth
    Args: N/A
    Returns: [ddd.dd]

BEAM    Chop/Nod info for chopping secondary
    Args: N/A
    Returns: ???
```

```
CORRECTIONS  String describing what corrections and rates are
enabled/disabled
    Args: N/A
    Returns: MPNARFp+tob
        M=Proper Motion
        P=Precession
        N=Nutation
        A=Aberration
        R=Refraction
        F=Flexure
        p=Parallax
        +=pointing model used...  can change to a,b,c,d?
        t=Sidereal
        o=Object
        b=Bias
    If disabled, character will be replaced by "_"
```

```
DATE    date based on UT
    Args: N/A
    Returns: [MM/DD/YYYY]
```

```
DEC Declination
    Args: N/A
    Returns [ddmmss.ss]
```

```
DISABLE Output state
    Args: N/A
    Returns: 1 for disabled, 0 for enabled
```

```
DISEPOCH Current Epoch
    Args: N/A
    Returns: XXXX.x
```

```
EL  Elevation
    Args: N/A
    Returns: [ddd.dd]
```

```
EQ  Equinox
    Args: N/A
    Returns: XXXXX.x
```

```
HA  Hour Angle
    Args: N/A
    Returns: [dd:mm:ss]
```

```
JD  Julian Date
    Args: N/A
    Returns: [JJJJJJJ.j]
```

```
LIMIT   limit status bits (ACCORDING TO JAVA GUI)
    Args: N/A
    Returns: this returns an 8 bit integer whose bits represent the
following
        bit0(LSB) =     RA low limit
        bit1    =    RA upper limit
        bit2    =    DEC low limit
        bit3    =    DEC upper limit
        bit4-6    =    unknown ???????
        bit7    =    limit warning?
        bit8    =    limit warning?
        a 1 indicates limit active, 0 indicates limit not active
```

```
LIMIT   limit status bits  (ACCORDING TO ERIC CHRISTIENSEN)
    Args: N/A
    Returns: this returns an 8 bit integer whose bits represent the
following
        bit0(LSB) =     RA/HA limit
        bit1    =    DEC limit
        bit2    =    derot.
        bit3    =    hor. hard limit
        bit4    =    hor. soft limit
        bit5    =    focus lo limit?
        bit6    =    focus hi limit?
        a 1 indicates limit active, 0 indicates limit not active

MOTION  Motion status bits
    Args: N/A
    Returns: this returns an 8 bit integer whose bits represent the
```

```
following
        bit0(LSB) =     RA/AZ
        bit1    =    DEC/EL
        bit2    =    FOC
        bit3    =    DOME
        bit4-8    =    undefined
        a 1 indicates axis in motion, 0 indicates no motion
```

```
PAD String describing hardware paddle button states
    Args: N/A
    Returns: any combination of the following charachers
        N = North
        S = South
        E = East
        W = West
        D = Drift (if not present, assume Guide)
    A characher is present if switch active, otherwise switch inactive
```

```
PADDRIFT Hardware paddle drift rate arcsec/sec
    Args: N/A
    Returns: -XXXXXXXXX.xxx
```

```
PADGUIDE Hardware paddle guide rate arcsec/sec
    Args: N/A
    Returns: -XXXXXXXXX.xxx
```

```
RA  Right Assention
    Args: N/A
    Returns: [ddmmss.ss]
```

```
SECZ    Air Mass
    Args: N/A
    Returns: [XXXXX.XX]
```

```
ST  Sidereal Time
    Args: N/A
    Returns: [hh:mm:ss]
```

```
TIME    Universal Time
    Args: N/A
    Returns: [HH:MM:SS]
```

```
VERIFY  Verify that an RA/DEC position is within telescope limits
    Args: [RA] [DEC] [Epoch]
        RA=HH:MM:SS.ss
        DEC=DD:MM:SS.ss
        Epoch=EEEE.eeee
    Returns: 1 if coordinate is within limits
```

```
XALL    "Extended ALL"
```

```
    Args: N/A
    Returns: [FOC] [DOME] [IIS] [PA] [UTD] [JD]
        FOC(focus pos) = +XXXXXX
        DOME(Dome Position) = -180 (always this value...)
        IIS(???) = -224.4 (always this value...)
        PA(Paralactic Angle) = -145.7 (always this value...)
        UTD(UT Date) = MM/DD/YYYY
        JD(Julian Date) = XXXXXXX.x
```

```
XDEC    "Extended DEC"
    Args: N/A
    Returns: [COM] [NEXT] [REF] [OFF] [WOB] [DIFF] [BIAS] [GUIDE] [DRIFT]
        COM(Commanded Position) = +HH:MM:SS.ss
        NEXT(Next Position) = +HH:MM:SS.ss
        REF(Reference Position) = +HH:MM:SS.ss
        OFF(Offset Position) = +HH:MM:SS.ss
        WOB(Wobble) = +HH:MM:SS.ss
        DIFF(Difference) = +XXXXXXXXX.xxx
        BIAS(Bias Rate) = +XXXXXXXXX.xxx
        GUIDE(Guide Rate) = +XXXXXXXXX.xxx
        DRIFT(Drift Rate) = +XXXXXXXXX.xxx

XRA "Extended RA"
    Args: N/A
    Returns: [COM] [NEXT] [REF] [OFF] [WOB] [DIFF] [BIAS] [GUIDE] [DRIFT]
        COM(Commanded Position) = HH:MM:SS.ss
        NEXT(Next Position) = HH:MM:SS.ss
        REF(Reference Position) = HH:MM:SS.ss
        OFF(Offset Position) = +HH:MM:SS.ss
        WOB(Wobble) = +HH:MM:SS.ss
        DIFF(Difference) = +XXXXXXXXX.xxx
        BIAS(Bias Rate) = +XXXXXXXXX.xxx
        GUIDE(Guide Rate) = +XXXXXXXXX.xxx
        DRIFT(Drift Rate) = +XXXXXXXXX.xxx
```

Command:

```
ABERRATE  Aberration corrections enable/disable
    Args: "ON" = enable, any other string will disable
    Returns:  "OK" or "FAILED"
```

```
BIAS    Bias enable/disable
    Args: "ON" = enable, any other string will disable
    Returns:  "OK" or "FAILED"
```

```
BIASDEC DEC bias rate in arcseconds/second
    Args: [XXXXX.XX]
    Returns: "OK" or "FAILED"
```

```
BIASRA  RA biasrate in arcsseconds/second
    Args: [XXXXX.XX]
    Returns: "OK" or "FAILED"
```

```
CANCEL  Cancel current move
    Args: N/A
    Returns:  "OK" or "FAILED"
```

```
CLEARDIFF  Clear RA and DEC difference value
    Args: N/A
    Returns: N/A
```

```
DISABLE disable motion output
    Args: N/A
    Returns: "OK" or "FAILED"
```

```
DISEPOCH Set Epoch
    Args: XXXX.x
    Returns: "OK" or "FAILED"
```

```
DECLARE Initialize current position
    Args: "INITNEXT" to initialize "NEXT" position as current position
          "INITCOM" to initialize "COMMANDED" position as current position
    Returns: "OK" or "FAILED"
```

```
ELAZ    Move to position in Elevation and Azmouth
    Args: [EEE.EE] [AAA.AA]
    Returns: "OK" or "FAILED"
```

```
ENABLE  enable motion output
    Args: N/A
    Returns: "OK" or "FAILED"
```

```
FLEX    Flexure corrections enable/disable
    Args: "ON" = enable, any other string will disable
    Returns:  "OK" or "FAILED"
```

```
LIMIT   Limit override >> USE WITH EXTREME CAUTION!!!!!
    Args: "INHIBIT" will override limits, all other strings will enable
limits
    Returns: "OK" or "FAILED"
```

```
MOVNEXT Move to NEXT position
    Args: N/A
    Returns: "OK" or "FAILED"
```

```
MOVOFF  move to OFFSET position
    Args: N/A
    Returns: "OK" or "FAILED"
```

```
MOVRADEC  Move to RA-DEC position
    Args: RA DEC EPOCH RAPM DECPM
        RA = HH:MM:SS.ss
        DEC = +DD:MM:SS.ss
        EPOCH = EEEE.eeee
        RAPM(RA Proper Motion) = XXXXX.xxx
        DECPM(DEC Proper Motion) = XXXXX.xxx
    Returns: "OK" or "FAILED"
```

```
MOVSTOW Move to stow position
    Args: N/A
    Returns: "OK" or "FAILED"
```

```
MOVWOB  MOVWOB beam
    Args: ???
    Returns: ???
```

```
NEXTPOS Set NEXT position
    Args: RA DEC EPOCH RAPM DECPM
        RA = HH:MM:SS.ss
        DEC = +DD:MM:SS.ss
        EPOCH = EEEE.eeee
        RAPM(RA Proper Motion) = XXXXX.xxx
        DECPM(DEC Proper Motion) = XXXXX.xxx
    Returns: "OK" or "FAILED"
```

```
NUTAT   Nutation corrections enable/disable
    Args: "ON" = enable, any other string will disable
    Returns:  "OK" or "FAILED"
```

```
PAD Software paddle command [Direction] [rate]  or PAD XX for termination
    Args: [Direction] [rate]
        DIRECTION = NORTH, SOUTH, EAST, WEST, NE, NW, SE, SW
        RATE = XXXXXXX.xx (arcsecs/sec)
        any string not described in DIRECTION will terminate paddle
    Returns: "OK" or "FAILED"
```

```
PADDLE  Paddle enable/disable
    Args: "ON" = enable, any other string will disable
    Returns: "OK" or "FAILED"
```

```
PADDRIFT  Paddle Drift rate in arcseconds/second
    Args: [XXXXX.XX]
    Returns: "OK" or "FAILED"
```

```
PADGUIDE  Paddle Guide rate in arcseconds/second
    Args: [XXXXX.XX]
    Returns:  "OK" or "FAILED"
```

```
PARALLAX  Parallax corrections enable/disable
    Args: "ON" = enable, any other string will disable
    Returns:  "OK" or "FAILED"
```

```
PARAM   ???
    Args: ???
    Returns: ???
```

```
PRECES  Precession corrections enable/disable
    Args: "ON" = enable, any other string will disable
    Returns:  "OK" or "FAILED"
```

```
PROPMO  Proper motion corrections enable/disable
    Args: "ON" = enable, any other string will disable
    Returns:  "OK" or "FAILED"
```

```
REFPOS  REFerence POSition (tod)
    Args: ???
    Returns: ???
```

```
REFRAC  Refraction corrections enable/disable
    Args: "ON" = enable, any other string will disable
    Returns:  "OK" or "FAILED"
```

```
STEPDEC Move Declination XXXXX.XX arcseconds
    Args: [XXXXX.XX]
    Returns:  "OK" or "FAILED"
```

```
STEPRA  Move Right Assention XXXXX.XX arcseconds
    Args: [XXXXX.XX]
    Returns:  "OK" or "FAILED"
```

```
TRACK   Enable/Disable sidereal tracking
    Args: "ON" = enable, any other string will disable
    Returns:  "OK" or "FAILED"

WOBBLE  WOBBLE -HH:MM:SS.ss -DD:MM:SS.ss
    Args: ???
    Returns: ???
```

Catalogs Command

```
ABELL   ABELL Catalog object XXXXXXX
    Args: XXXXXXX
    Returns: "OK" or "FAILED"
```

```
FK5 FK5 Catalog object XXXXXXX
    Args: XXXXXXX
    Returns: "OK" or "FAILED"
```

```
IC  IC Catalog object XXXXXXX
    Args: XXXXXXX
    Returns: "OK" or "FAILED"
```

```
NGC NGC Catalog object XXXXXXX
    Args: XXXXXXX
    Returns: "OK" or "FAILED"
```

```
OKESTONE  Okestone Catalog object XXXXXXX
    Args: XXXXXXX
    Returns: "OK" or "FAILED

PPM PPM Catalog object XXXXXXX
    Args: XXXXXXX
    Returns: "OK" or "FAILED"
```

```
SAO SAO Catalog Object XXXXXXX
    Args: XXXXXXX
    Returns: "OK" or "FAILED"
```

```
YBSC    YSBC Catalog Object XXXXXXX
    Args: XXXXXXX
    Returns: "OK" or "FAILED"
```

```
ZWICKY  ZWICKY Catalog object XXXXXXX
    Args: XXXXXXX
    Returns: "OK" or "FAILED"
```

Planets Command:

```
MERCURY Track Mercury
    Args: N/A
    Returns: "OK" or "FAILED"
```

```
VENUS   Track Venus
    Args: N/A
    Returns: "OK" or "FAILED"
```

```
MARS    Track Mars
    Args: N/A
    Returns: "OK" or "FAILED"
```

```
JUPITER Track Jupiter
    Args: N/A
    Returns: "OK" or "FAILED"
```

```
SATURN  Track Saturn
    Args: N/A
```

```
    Returns: "OK" or "FAILED"
```

```
URANUS  Track Uranus
    Args: N/A
    Returns: "OK" or "FAILED"
```

```
NEPTUNE Track Neptune
    Args: N/A
    Returns: "OK" or "FAILED"
```

```
PLUTO   Track Pluto
    Args: N/A
    Returns: "OK" or "FAILED"
```

```
MOON    Track Moon
    Args: N/A
    Returns: "OK" or "FAILED"
```

```
SUN Track Sun
    Args: N/A
    Returns: "OK" or "FAILED"
```

Dome Request:

```
DOME    Dome control information
    Args: "PARAM" returns dome setup parameters, all other strings return
control info
    Returns:
        Parameters: [CPD] [SD] [W] [SDW] [NU] [RHO] [PHI] [LOOK] [HOLD]
            CPD(Counts Per Degree) = XXX.xxxxxxx
            SD(Stow Degrees)= XXX.xxxxxxx
            W(Dome Width) = XXX.xxxxxxx
            SDW(Stow Dome Width)= XXX.xxxxxxx
            NU = XXX.xxxxxxx
            RHO = XXX.xxxxxxx
            PHI = XXX.xxxxxxx
            LOOK(Lookahead) = XX
            HOLD(Hold Dome) = XX
        Control Info: [DEL] [MOD] [INIT] [TELAZ] [AZ] [HOME]
            DEL(Delta Position) = +XXX.XXXXXXX
            MOD(Mode) = XX
            INIT(Initialized) = XX
            TELAZ(Telescope Azmouth) =  +XXX.XXXXXXX
            AZ(Dome Azmouth) = +XXX.XXXXXXX
            HOME(Home Position) = +XXX.XXXXXXX
```

Command:

```
DOME    Command dome control
    Args: This command takes one argument at a time from the following
```

```
        AUTO    Autodome enable
            Args: ON = autodome on, any other = autodome off
            Returns:   "OK" or "FAILED"
```

```
        INIT    Initialize dome
            Args: N/A
            Returns:   "OK" or "FAILED"
```

```
        STOW    Stow dome
            Args: N/A
            Returns:   "OK" or "FAILED"
```

```
        LOOKAHEAD  Lookahead enable
            Args: positive nonozero number=enable, any other = disable
            Returns:   "OK" or "FAILED"
```

```
        PARAM    Set Dome Parameters
            Args: [CPD] [SD] [W] [SDW] [NU] [RHO] [PHI] [LOOK] [HOLD]
                CPD(Counts Per Degree) = XXX.xxxxxxx
                SD(Stow Degrees)= XXX.xxxxxxx
                W(Dome Width) = XXX.xxxxxxx
                SDW(Stow Dome Width)= XXX.xxxxxxx
                NU = XXX.xxxxxxx
                RHO = XXX.xxxxxxx
                PHI = XXX.xxxxxxx
                LOOK(Lookahead) = XX
                HOLD(Hold Dome) = XX
                Returns:   "OK" or "FAILED"
```

```
        PADDLE    Control Paddle buttons
            Args: RIGHT = move right, LEFT = move left, any other= stop
            Returns:   "OK" or "FAILED"
```

Focus Request

```
FOCSPEED Focus Speed
    Args: N/A
    Returns: ["FAST" or "SLOW"]
```

```
FOCUS   Focus position
    Args: N/A
    Returns: +XXXXX
```

Command

```
FOCUS   move to absolute focus value XXXXXXX
    Args: XXXXXXX
    Returns: "OK" or "FAILED"
```

```
RELFOCUS  relative move focus value XXXXXXX
    Args: XXXXXXX
    Returns: "OK" or "FAILED"
```

```
FOCZERO Zero current focus position
    Args: N/A
    Returns: "OK" or "FAILED"
```

```
FOCSTOP focus paddle stop
    Args: N/A
    Returns: "OK" or "FAILED"
```

```
FOCUP   focus paddle up
    Args: N/A
    Returns: "OK" or "FAILED"
```

```
FOCDN   focus paddle down
    Args: N/A
    Returns: "OK" or "FAILED"
```

```
FOCSPEED  Set focus speed
    Args: "FAST" sets to fast, all other strings set speed slow
    Returns: "OK" or "FAILED"
```

PEC Request

```
PECSTAT Current PEC operation status
    Args: N/A
    Returns: [PEC_Condition] [PEC_Count] [PEC_Index] [PEC_Mode]
```

```
PECPROG Current PEC programming status
    Args: N/A
    Returns: [Percent_Done] [PEC_Correction]
```

Command

```
PECFILE Attempt to create a PEC file.
    Args: ???
    Returns: ???
```

```
PEC Turn on PEC
    Args: "ON" = enable, any other string will disable
    Returns: "OK" or "FAILED"
```

Servo Request

```
CON ??? >> SERVO STUFF...  NOT FOR NORMAL USE
    Args: ???
    Returns: ???
```

```
SAMDATA ??? >> SERVO STUFF...  NOT FOR NORMAL USE
    Args: ???
    Returns: ???

SAMDONE ??? >> SERVO STUFF...  NOT FOR NORMAL USE
    Args: ???
    Returns: ???
```

```
SERVO   ??? >> SERVO STUFF...  NOT FOR NORMAL USE
    Args: ???
    Returns: ???
```

Command

```
WCON    axis, gd gp gi dmax vmax groot  >> SERVO CONST...  DO NOT MODIFY
    Args: ???
    Returns: ???
```

```
SERVO   ???    >>  AXIS SERVO SAMPLING...  DO NOT MODIFY
    Args: ???
    Returns: ???
```

```
GD  axis, value >> SERVO CONST...  DO NOT MODIFY
    Args: ???
    Returns: ???
```

```
GP  axis, value >> SERVO CONST...  DO NOT MODIFY
    Args: ???
    Returns: ???
```

```
GPI axis, value >> SERVO CONST...  DO NOT MODIFY
    Args: ???
    Returns: ???
```

```
DMAX    axis, value >> SERVO CONST...  DO NOT MODIFY
    Args: ???
    Returns: ???
```

```
VMAX    axis, value >> SERVO CONST...  DO NOT MODIFY
    Args: ???
    Returns: ???
```

```
PERMAX  axis, value >> SERVO CONST...  DO NOT MODIFY
    Args: ???
    Returns: ???
```

```
SAMPLE  axis, interval, total samples  >>  AXIS SERVO SAMPLING...  DO NOT
MODIFY
    Args: ???
```

```
    Returns: ???
```

```
DUMPSAM axis   >>  AXIS SERVO SAMPLING...  DO NOT MODIFY
    Args: ???
    Returns: ???
```

```
SAMSTART  ???    >>  AXIS SERVO SAMPLING...  DO NOT MODIFY
    Args: ???
    Returns: ???
```

```
SAMABORT  ???    >>  AXIS SERVO SAMPLING...  DO NOT MODIFY
    Args: ???
    Returns: ???
```

undefined??? Request

```
TEST1   ??? >> probably useless but is currently in the command set
    Args: ???
    Returns: ???
```

```
INDEX   ???
    Args: ???
    Returns: ???
```

```
PP  ???
    Args: ???
    Returns: ???
```

```
SRVFRQ  ???
    Args: ???
    Returns: ???
```

Command

```
SYSSAVE ???
    Args: ???
    Returns: ???
```

```
SYSKILL ???
    Args: ???
    Returns: ???
```