Appendix B

Remote Mnemonics

All Remote commands are received by PC-TCS over one or more of the eight possible serial ports. Remote command reception is enabled via the **Remote** subsubsubmenu (see Chapter 3 - the **Input** subsubmenu.) or via Command Files.

Remote commands are a subset of the Command File mnemonics along with a few additions applicable to remote operations. Serial commands may be "checksummed" for better command validation.

If the command is determined to be valid and executable by PC-TCS, the command will be processed and an acknowledgment will be returned to the user in the form of a alternating uppercase "E" or lowercase "e" character embedded in the telemetry stream in appropriate channel column (see Appendix C), along with a hardware handshake in the form of a change of state in the signal on the CTS line of the serial channel used (see Appendix G). Erroneous commands will *not* be acknowledged with the CTS state change and the telemetry stream will hold an error code describing the problem in the appropriate channel column. (See Appendix C.)

A Note on Remote Command Transmission

The user should be careful not to send a new remote command until the previous command has been acknowledged by PC-TCS. The user should wait for the CTS state change and/ or the telemetry stream update before sending the next command. Commands are buffered by PC-TCS in a common memory area. Sending a new command before PC-TCS acknowledges receipt of the previous command may cause an overwrite of the command buffer and affect proper command execution.

The following pages describe the Remote commands that PC-TCS will recognize.

ABERON: Turns the Position Correction for Aberration ON. Used to correct Telescope Pointing.

ABEROFF: Turns the Position Correction for Aberration OFF.

ACCESS XXXXXXXX: Allows changing the security level. XXXXXXXX is the appropriate password for the level.

BIASDEC ±ss.s: Defines Declination component of bias rate. Use with BIASRA to define full BIAS rate. Use BIASON and BIASOFF to activate and deactivate, respectively, the rate.

BIASOFF: Deactivates previously declared bias rates. (See chapter 3 - **Motion** submenu.)

BIASON: Activates previously declared bias rates. (See chapter 3 - **Motion** submenu.)

BIASRA ±ss.s: Defines Right Ascension component of bias rate. Use with BIASDEC to define full BIAS rate. Use BIASON and BIASOFF to activate and deactivate, respectively, the rate.

CANCEL: Cancel telecope move command - identical to the Motion Cancel menu item documented in Chapter 2.

CDBIASOFF: Turns the Cosine δ correction OFF for any declared BIAS rates.

CDBIASON: Turns the Cosine δ correction ON for any declared BIAS rates.

CDDRIFTOFF: Turns the Cosine δ correction OFF for any declared DRIFT rates.

CDDRIFTON: Turns the Cosine δ correction ON for any declared DRIFT rates.

CDGUIDEOFF: Turns the Cosine δ correction OFF for any declared GUIDE rates.

CDGUIDEON: Turns the Cosine δ correction ON for any declared GUIDE rates.

CDWOBOFF: Turns the Cosine δ correction OFF for any declared WOBBLE Vectors.

CDWOBON: Turns the Cosine δ correction ON for any declared WOBBLE Vectors.

CLEARDIFF: Performs the same function as the F5 hotkey and the Clear diff option of the **Declare** submenu.

CLIRESUME: Enables CLI command file processing in the event a CLI WAITREM command has been executed. (See WAITREM command in Command File Mnemonics).

COMFILELOAD filename: Requests that PC-TCS attempt to load the Command File named "filename" from disk command input. Use with COMFILEON command to execute the Command File. Note that the file name specified should *not* include the ".TCS" extension.

COMFILEOFF: Suspends Command File execution if one is in progress.

COMFILEON: Resumes or begins Command File execution if a Command File has been loaded previously with the **COMFILELOAD** command.

DECLAREINIT: Instructs PC-TCS to declare the NEXT Object coordinates as the current coordinates. Used to initialize the telescope coordinate system at the beginning of an observing session. (See chapter 3 - **Declare** submenu.)

DECLAREREF: Saves the current coordinates as the REFERENCE Object. Used with MOVREF to move to the saved coordinate.

DECLARESTOW: Instructs PC-TCS to make the current position in Hour Angle and Declination the New Stow Position of the Telescope. Subsequent MOVSTOW commands will move the telescope to this HA and DEC.

DISEPOCH ####.##: Changes the display epoch for current commanded and reference displays.

DRIFTDEC ±ss.s: Defines Declination component of drift rate.

DRIFTRA ±ss.s: Defines Right Ascension component of drift rate.

ELAZ ee.e aaa.a: Instructs PC-TCS to move the telescope to the specified Elevation (ee.e) and Azimuth (aaa.a).

EPOCH ####.##: Changes the input epoch for manual NEXTRA and NEXTDEC precession computations. (Should not be used to change epoch when catalogs are being used for NEXT object input.)

FLEXON: Turns the Position Correction for Telescope Flexure ON. Used to correct Telescope Pointing.

FLEXOFF: Turns the Position Correction for Telescope Flexure OFF.

FLEXRATEON: Turns the Rate Correction for Telescope Flexure ON. Used to correct telescope tracking for differential flexure.

FLEXRATEOFF: Turns the Rate Correction for Telescope Flexure OFF.

FILEPERM filename: Requests that PC-TCS use the permanent catalog file specified by "filename" for NEXT coordinate input. Use with OBJECT command to read file. Note that the file name specified should *not* include the ".PCF" extension.

FILEUSER filename: Requests that PC-TCS use the user catalog file specified by "filename" for NEXT coordinate input. Use with OBJECT command to read file. Note that the file name specified should *not* include the ".CAT" extension.

GUIDEDEC ±ss.s: Defines Declination component of guide rate.

GUIDERA ±ss.s: Defines Right Ascension component of guide rate.

JUPITER: Computes the position of the planet Jupiter as the NEXT object position. Use with **MOVNEXT** Command to move to this computed position.

KILL: Disables the servo drive output of PC-TCS to the servo amplifiers. This command is identical to the **Disable** command described in Chapter 2 of this manual. (Also see the "UNKILL" command later in this Chapter.)

LIMITENABLE: Used to reeanble the limit detection software after a **LIMITOVERRIDE** command has been issued.

LIMITOVERRIDE: Used to disable limit detection software. Can be used to acquire objects below the PC-TCS limits. USE WITH EXTREME CAUTION.

LUNARRATEOFF: Turns the lunar rate correction OFF during tracking.

LUNARRATEON: Turns the lunar rate correction ON during tracking.

MANUAL: Resets MANUAL (Keyboard) data entry mode. Note this command is not specifically necessary if NEXTRA and NEXTDEC are used but is included for continuity.

MARS: Computes the position of the planet Mars as the NEXT object position. Use with **MOVNEXT** Command to move to this computed position.

MERCURY: Computes the position of the planet Mercury as the NEXT object position. Use with **MOVNEXT** Command to move to this computed position.

MOON: Computes the position of the Moon as the NEXT object position. Use with **MOVNEXT** Command to move to this computed position.

MOVB1: Moves telescope to the current minus previously declared WOBBLE vector position. Command pauses execution until motion is completed (stable). (See chapter 3 - **Move** submenu.)

MOVB2: Moves telescope to the current plus previously declared WOBBLE vector position. Command pauses execution until motion is completed (stable). (See chapter 3 - **Move** submenu.)

MOVNEXT: Moves telescope to the previously declared NEXT object. Command pauses execution until motion is completed (stable). (See chapter 3 - **Move** submenu.)

MOVOFF: Moves telescope to the current plus previously declared OFFSET vector position. Command pauses execution until motion is completed (stable). (See chapter 3 - **Move** submenu.)

MOVREF: Moves telescope to the previously declared REFERENCE object. (See DECLAREREF command.) Command pauses execution until motion is completed (stable). (See chapter 3 - **Move** submenu.)

MOVSTOW: Moves telescope to the STOW position. Command pauses execution until motion is completed (stable). (See chapter 3 - **Move** submenu.)

NEPTUNE: Computes the position of the planet Neptune as the NEXT object position. Use with **MOVNEXT** Command to move to this computed position.

NEXTDEC ±ddmmss.s: Defines NEXT position Declination. Use NEXTRA to define full NEXT position. Use MOVNEXT to move to NEXT position.

NEXTRA hhmmss.s: Defines NEXT position Right Ascension. Use NEXTDEC to define full NEXT position. Use MOVNEXT to move to NEXT position.

NOP: A "do nothing" (no operation) command that allows the user to test the communications integrity of the serial channel in use. Useful in developement and debugging of PC-TCS serial communications software.

NUTON: Turns the Position Correction for Nutation ON. Used to correct Telescope Pointing.

NUTOFF: Turns the Position Correction for Nutation OFF.

OBJECT ####: Instructs PC-TCS to retrieve object number #### from the previously specified catalog file. See FILEUSER and FILEPERM commands.

OFFDEC ±ddmmss.s: Defines OFFSET vector Declination. Use OFFRA to define full OFFSET vector. Use MOVOFF to move to offset.

OFFRA hhmmss.s: Defines OFFSET vector Right Ascension. Use OFFDEC to define full OFFSET vector. Use MOVOFF to move to offset.

ORBIT object: Requests that PC-TCS compute the current position of the object whose orbital parameters are in the file "object". Note that the file name specified should *not* include the ".ORB" extension.

PARAOFF: Turns the Position Correction for Topocentric Parallax OFF.

PARAON: Turns the Position Correction for Topocentric Parallax ON. Used to correct Telescope Pointing.

PRECOFF: Turns the Position Correction for Precession OFF.

PRECON: Turns the Position Correction for Precession ON. Used to correct Telescope Pointing.

PROPEROFF: Turns the Position Correction for Proper Motion OFF.

PROPERON: Turns the Position Correction for Proper Motion ON. Used to correct Telescope Pointing.

PLUTO: Computes the position of the planet Pluto as the NEXT object position. Use with **MOVNEXT** Command to move to this computed position.

RASTER rr.r dd.d RR DD tt.t key: Invokes the Raster scan utility with Right Ascension step size of rr.r arcseconds, declination step size of dd.d arcseconds, for RR steps in Right Ascension, DD steps in Declination, with a dwell time of tt.t

seconds. The "key" parameter is used to decide the input upon which the Raster will terminate. Zero (0) will perform the full raster scan with no interruption capability, one (1) will terminate the raster if the TTL S1 input is high, two (2) will terminate the raster if the TTL S2 input is high, three (3) will terminate the raster if the TTL S3 input is high, four (4) will terminate the raster if the TTL S4 input is high, five (5) will terminate the raster if a keyboard character input is detected.

RECALLPOS ##: Recalls a previously saved position (see SAVEPOS command) and copies the coordinates to the NEXT position registers. The telescope can be commanded to move to this position using the MOVNEXT command. ## can have a vaule between 1 and 15.

REFRACOFF: Turns the Position Correction for Atmospheric Refraction OFF.

REFRACON: Turns the Position Correction for Atmospheric Refraction ON. Used to correct Telescope Pointing.

REFRRATEOFF: Turns the refraction rate correction OFF during tracking.

REFRRATEON: Turns the refraction rate correction ON during tracking.

REMOTECHKOFF: Turns Remote Serial Access command checksumming OFF.

REMOTECHKON: Turns Remote Serial Access command checksumming ON.

SATURN: Computes the position of the planet Saturn as the NEXT object position. Use with **MOVNEXT** Command to move to this computed position.

SAVEPOS ##: Saves the current position of the telescope to the save register ##. The position can later be retrieved via the RECALLPOS command.

SETDATE *mm/dd/yyyy*: Sets the UT date for PC-TCS operation. Date string must conform to the syntax described - single digit months and days must have preceeding zeros.

SETTIME hhmmss.s: Sets the current UT time for PC-TCS operation. time string must conform to the syntax described - single digit minutes and seconds must have preceeding zeros.

SLEWOFF: Deactivates slew permit for slow slews from object to object. (See chapter 3 - **External I/O** subsubsubmenu.) Note: this command is NOT avaialblle if you installation has a Slew Permit button that must be pressed to enable slew.

SLEWON: Activates slew permit for fast slews from object to object. (See chapter 3 - **External I/O** subsubsubmenu.) Note: this command is NOT avaialblle if you installation has a Slew Permit button that must be pressed to enable slew.

SOLARRATEOFF: Turns the Solar rate correction OFF during tracking.

SOLARRATEON: Turns the Solar rate correction ON during tracking.

SPIRAL ss.s LL tt.t key: Invokes the Spiral scan utility with Right Ascension and Declination step size of ss.s arcseconds, for LL loops, with a dwell time of tt.t seconds. The "key" parameter is used to decide the input upon which the Spiral will terminate. Zero (0) will perform the full raster scan with no interruption capability, one (1) will terminate the spiral if the TTL S1 input is high, two (2) will terminate the spiral if the TTL S2 input is high, three (3) will terminate the spiral if the TTL S3 input is high, four (4) will terminate the spiral if the TTL S4 input is high, five (5) will terminate the spiral if a keyboard character input is detected.

STEPDEC: ±#### Commands the telescope to move #### "steps" in declination. Note: "steps" are true stepper motor steps and are therefore subarcsecond in size. The command is meant to give "guiding" capabilities to operators or smart instruments using the serial command channels to control the telescope.

STEPRA: ±#### Commands the telescope to move #### "steps" in Right Ascension. Note: "steps" are true stepper motor steps and are therefore subarcsecond in size. The command is meant to give "guiding" capabilities to operators or smart instruments using the serial command channels to control the telescope.

SUN: Computes the position of the Sun as the NEXT object position. Use with **MOVNEXT** Command to move to this computed position.

TRKOFF: Turns the sidereal tracking off. (See chapter 3 - **Motion** submenu.)

TRKON: Turns the sidereal tracking on. (See chapter 3 - **Motion** submenu.)

UNABEROFF: Turns the deconvolution for Aberration OFF.

UNABERON: Turns the deconvolution for Aberration ON.

UNFLEXOFF: Turns the deconvolution for Flexure OFF.

UNFLEXON: Turns the deconvolution for Flexure ON.

UNKILL: Reenables the servo drive output of PC-TCS to the servo amplifiers after a hard limit violation or PANIC situation or a disable accomplished with the KILL command. (Also see the "KILL" command earlier in this Chapter.)

UNREFROFF: Turns the deconvolution for Refraction OFF.

UNREFRON: Turns the deconvolution for Refraction ON.

URANUS: Computes the position of the planet Uranus as the NEXT object position. Use with **MOVNEXT** Command to move to this computed position.

VENUS: Computes the position of the planet Venus as the NEXT object position. Use with **MOVNEXT** Command to move to this computed position.

WOBDEC ±ddmmss.s: Defines WOBBLE vector Declination. Use WOBRA to define full WOBBLE vector. Use MOVB1 and MOVB2 to move to beams.

WOBOFF: Turns the remote hardware wobble sensing off. (See chapter 3 - under **Remote** subsubsubmenu.)

WOBON: Turns the remote hardware wobble sensing on. (See chapter 3 - under **Remote** subsubsubmenu.)

WOBRA hhmmss.s: Defines WOBBLE vector Right Ascension. Use WOBDEC to define full WOBBLE vector. Use MOVB1 and MOVB2 to move to beams.