TELESCOPE POINTING

Telescope pointing is currently handled by the data-taking Suns. Each dome has its own setup on the Sunfor pointing and data collection/reduction. The pointing for the 0.8m telescope is handled by Miranda, the Sun at the 2.1m telescope. The pointing is handled by a group of programs that are known as the SUNPOINT programs. The SUNPOINT programs take care of the zero offsets (except at the 30"), the calculation of the coordinates as well as feed back to the host data collection program of the current location of the telescope. See the McDonald User Manuals and the messages when you open a window on the Suns for each telescope for more information on SUNPOINT and pointing.

Coordinate Files

Coordinate files brought to the observatory should be in the format shown below. They should be in a file called worklist.dat and should be in the home directory of the user on the computer used to run Cosmo/Point. The list immediately following is a star list.

```
  1 "ETA CAS   " 00 46 03.7  57 33 03  1950.0   0.137 -0.52    6.50  2.685
  2 "TAU_CET   " 01 41 44.7 -16 12 01  1950.0  -0.119  0.86    5.57 50.000
  3 "THETA PER " 02 40 46.3  49 01 06  1950.0   0.035 -0.08    4.59  1.695
  4 "IOTA PER  " 03 05 26.7  49 25 27  1950.0   0.130 -0.08    4.18  1.549
  5 "ALPHA FOR " 03 09 56.8 -29 10 59  1950.0   0.025  0.64    4.10  8.497
  6 "KAP 1 CET " 03 16 44.1  03 11 17  1950.0   0.018  0.10    3.99  2.166
  7 "EPS ERI   " 03 30 34.4 -09 37 35  1950.0  -0.066  0.02    3.76  2.587
  8 "DELTA ERI " 03 40 51.0 -09 55 53  1950.0  -0.007  0.75    3.59  2.413
  9 "OMI 2 ERI " 04 12 58.2 -07 43 46  1950.0  -0.150 -3.42    3.05  1.896
 10 "PI 3 ORI  " 04 47 07.4  06 52 32  1950.0   0.031  0.02    2.48  1.348
```

The coordinate field begins with a 5-character integer as shown above (lead with spaces). This is significant. The object name is a 10-character field. Do not begin an object name with a number. The coordinates themselves are in hours, minutes and seconds of RA, as shown above, followed by declination in degrees, minutes, seconds. A `+' is not necessary for positive declinations and you need not reserve a space for it. The epoch of the coordinates follows at the end. 2000.0 is the current default if none is given. This is followed by RA proper motion and DEC proper motion. Proper motion is not required by the Point program. The last 2 fields may be magnitude and color index. They are not required and are for your information only.

2.7m Cautions

* Always, ALWAYS watch both ends of the telescope while it is moving. Safety of the telescope and instrument is the responsibility of the observer. Extreme caution must be used when moving the telescope close to the north and south piers, platforms, strong back on top of elevator, cages on top of the old control room, cherry picker and other objects on the platforms. Watch also for trailing cables or bundles of cables on the floor. (Use common sense, and don't hurry!)

* If you leave the building (or the vicinity of the telescope) for more than a few minutes, either turn off the telescope tracking or be absolutely certain that the telescope cannot track into something while you are gone.

* Wait for the dome to come to a complete stop if you're changing dome motion direction.

* If the wind is so strong that it is moving the dome, cease observing at once and close the dome. Disable dome in TCS.

* If taking the telescope over the axis, be sure the instrument's cables are not snagged or pulled too tight (some of them are a bit short for going over the axis).

* If you should happen to bump the telescope into something, you must notify David Doss (675), Earl Green (657) or Don Wallace (671).

* If in doubt about the weather conditions, please see our weather page at http://weather.as.utexas.edu, the current weather conditions at http://nexus.as.utexas.edu/cgi-bin/obs_sup/latest_5min.cgi, and the weather closure rules.

Rules for Closing due to Weather.

Observers are operationally responsible for the safe operation of the telescopes. Whenever weather conditions prohibit safe operation, Observers must close the domes and suspend operation. In many instances a combination of factors, no one exceeding stated limits, will dictate to the reasonable observer that operation should be suspended.

Some of our observing stations are located so that the observer does not have good knowledge of the present weather or of impending weather conditions. Any observer who is aware of immediate or threatening weather conditions requiring action by other observers for the safety of telescopes, domes, instruments, etc. should notify the other observers immediately.

All Observers must continuously monitor the available weather sensors and Weather program conditions for indications requiring closure. Weather program information is accessible via a 107" control room monitor, the Sun workstations by entering "wx" on the command line, by checking the 107 TCS GUI, and by selecting "…Current Weather" on the OS web page at nexus.as.utexas.edu with any networked computer.

1. Precipitation

All domes must be closed when hail, mist, rain, sleet or snow appear imminent in the immediate area. Local precipitation alarms/indications are available locally in the 107" dome as well as via the Weather program which has a sensor at the 82" weather tower. If the local 107" alarm is flashing/sounding or the Weather program indicates a closing condition, at least one drop of rain has been detected and the domes should not be opened. If only the 107 alarm is indicating, other Mt Locke observers must be alerted as well. Should the alarm sound while the dome is open, immediately close the mirror cover, begin closing the dome shutter, move windscreens and/or telescope to best protect the primary mirror and instrument. As soon as possible, alert other observers as to the situation and then check outside conditions. False alarms are very rare so please carefully evaluate the outside conditions and Weather program status before reopening.

2. Wind

In high or strong, gusty winds dome rotation becomes difficult to control and may endanger the telescope or other equipment and personnel inside. The shutters are very large sail-like protrusions when open and could easily be damaged by the wind. Likewise, the windscreens can be damaged or forced from the guides and fall to the floor or onto the telescope or personnel. The telescopes are unlikely to be directly damaged by wind although falling objects easily could cause serious damage to mirrors or instruments.

The primary source for wind information will be the local weather station data as supplied by the WEATHER program. A backup instrument is available: the R. M. Young anemometer readout in the 2.7-m Cass control room as well as weather data from the HET site. The sensors for both instruments are mounted on the tower west of the 2.1-m dome and additional sensors are at the HET weather tower. In case all these instruments fail, hand-held anemometers are available in the 2.7m control room. The R. M. Young anemometer has a long time—constant, effectively averaging data over several seconds. Therefore, gusts do not record at their peak values and allowance for this must be made in reading the records.

If the WEATHER program is not usable then it is the responsibility of the observer at the 2.7-m telescope to notify other observers when critical wind speeds are reached.

All telescope domes will be closed when frequent wind gusts exceed 50 mph (as shown by at least three maximum readings above 50 mph in the previous five samples) or the 5-minute average of wind speed exceeds 50 mph or if single gusts greater than 55 mph are noted. If windblown gravel or debris is hitting a dome, it must be closed immediately; regardless of wind speed. Observers should elect to close at lower wind speeds should their work be affected by telescope vibration or if the wind causes severe difficulties with turning the dome.

In addition, precautionary measures will be taken at somewhat lower wind speeds for the 2.7-rn and 2.1-m telescopes. These actions are summarized in the following table:

Wind Condition Table, 2.7m and 2.1m Telescopes

5-min. Average Speed	Single Gusts	Action
50 mph	55 mph or 3 gusts > 50 w/in 5 min*	Close dome
45-50 mph	50 mph	Work downwind, be alert to close
40-45 mph	45 mph	Turn dome downwind at observer's earliest convenience
35-40 mph	40 mph	Close the shutters and windscreens to the minimum opening possible for the observations

* The wx program will keep track of this and report it; observers should check wx when the winds are high.

After closing or taking precautionary action, wait at least 30 minutes after the latest readout greater than the speed criterion before resuming operation. Weather program warnings will be removed when conditions are considered safe.

3. Humidity

Both relative humidity and dew point sensor data are available via WEATHER on computer network. The RH sensor is located on the tower west of the 82” and the dew point sensor is in the 107” old control room. Both sample the outside air but at different locations. When humidity becomes too high WEATHER will issue a warning at the bottom of the display.

Steadily increasing humidity and varying local conditions result in situations where the onset of condensation if difficult to determine. At high humidity levels each observer must monitor the weather using the control room displays where available as well as the wx program on the Suns. Each observer is responsible for monitoring the humidity reports and conditions then alerting other observers when relative humidity rises above 95%. Assuming the rain detectors have not already alarmed, follow the recommendations below.

If water is dripping into a dome from the edges of the shutter opening, the dome is to be closed. All domes should close if condensation is detected at any dome. Telescopes should be parked and windscreens positioned so that drops do not enter the front of the telescope or hit instruments.

Reopening

After domes have been closed for high humidity, they must not be reopened unless the relative humidity, as indicated by the weather program is below 95%, wait at least 30 minutes and observer inspection indicates the conditions are safe.

When reopening, care must be exercised to avoid letting water drop off a dome shutter and onto a mirror.

After reopening be alert for conditions which may require closing again.

4. Dust

Domes and mirror covers should be closed if high dust conditions are reported by the Weather program The weather program issues a warning at 50,000 counts however it does not require closure until it reaches 100,000. In many cases this level is too high so observers should carefully check for particles in the air using the dust monitor flashlight. If there is some question about the conditions reported by the weather program, observers must use their best judgment or call Observing Support personnel for assistance. Remember that wind and dust together create a greater problem for the optics than either alone.

Note that the dust sensor is shut down if humidity exceeds 85% as it cannot function properly above that level.