***Declination Angle Chart***

[***(dish size list***](http://www.geo-orbit.org/sizepgs/sizemainp.html#anchor416028) ***or*** [***tuning page)***](http://www.geo-orbit.org/sizepgs/tuningp4.html#anchor801578)

***(to*** [***Western Hemisphere***](http://www.geo-orbit.org/default.html)***,***[***Eastern Hemisphere***](http://www.geo-orbit.org/easthemipgs/easthemp.html),[***Footprints by Dish Size***](http://www.geo-orbit.org/sizepgs/sizemainp.html)***)***

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| Explanation of Declination Declination angle keeps satellite antenna from aiming into deep space and changes value with latitude in accordance to earth's curvature. |
| Early astronomers developed the polar mount to track stars. For deep space tracking, i.e. star observation, the elevation setting of the polar mount is equal to the latitude of the site location. However, geostationary satellites are much Footprints by Dish Size - Latitude Declination Chart - C/Ku-Band Satellite Listingcloser to earth than are celestrial objects and their observation requires a slight tilting 'downwards' from deep space observation settings to see the geostationary satellite arc.  This adjustment of (to) the polar mount, the tilting downwards, is the declination adjustment of the polar mount and its amount is the declination offset angle (not to be confused with the declination angle which is the sum of the declination offset angle and the polar axis zenith elevation angle).  The declination angle is determined by the formula below where 22300 is the distance from the surface of the earth to the satellite belt and 3964 is the radius of the earth (both in km.). In summary, the declination angle lowers the satellite antenna from looking into deep space to look at the arc of geostationary satellites. However, upon practice, it has been discovered that using the latitude as the elevation angle, ([first chart below](http://www.geo-orbit.org/sizepgs/decchartp.html" \l "anchor162802)), the satellites at the top of the arc, in a tracking mount system, were in perfect alignment with the satellite dish, i.e. were tracked perfectly by the polar mount, whereas the satellites at the lower ends of the arc where not tracking correctly. Conversely, if the satellites at the ends of the arc, on the horizon, were tracking correctly then the central satellites, at the top of the arc would be slightly off target. This effect is caused by the slight deviation from the true north/south line, caused by the act of the tilting of the dish, as the dish moves to view satellites lower on the arc, i.e. closer to the horizon. With this in mind, it was formulated the elevation/declination angles of the modified polar mount ([second chart below](http://www.geo-orbit.org/sizepgs/decchartp.html" \l "anchor165007)) whose application has no effect on seeing satellites at the top of the arc but has the effect of better tracking on the sides and low end of the arc. This effect is accomplished by slightly increasing the elevation angle and accordingly slightly decreasing the declination angle by the same amount. Use elevation/declination settings from the [modified polar mount chart](http://www.geo-orbit.org/sizepgs/decchartp.html#anchor165007) (second chart below) when installing and adjusting your polar mount tracking system - compare the values of the two charts below to see the difference in elevation and declination angles. **Note:** Elevation and declination angles are always measured and applied when the dish is at its zenith, i.e. highest point in the arc, when the dish axis is aligned along the true north-south line. ([Applying declination/elevation angles](http://www.geo-orbit.org/sizepgs/tuningp4.html" \l "anchor801578).) |
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| Declination angle for normal mounts may be found by using the following equation: ARCTAN((3964\*SIN(L)/(22300+3964(1-COS(L))))) Where 'L' is your site latitude. **NOTE:** This formula does not yield modified polar mount declination values but yields the values in the chart immediately below. |

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| Declination Angle Chart **NOTE:** This table is for traditional polar mount adjustment where elevation angle=latitude; for modified polar mount declination values see [second chart](http://www.geo-orbit.org/sizepgs/decchartp.html#anchor165007) below. | | | | | | | |
| **Latitude (deg)** | **Declination Angle (deg)** | **Latitude (deg)** | **Declination Angle (deg)** | **Latitude (deg)** | **Declination Angle (deg)** | **Latitude (deg)** | **Declination Angle (deg)** |
| 1 | 0.18 | 24 | 4.07 | 46 | 6.92 | 69 | 8.47 |
| 2 | 0.36 | 25 | 4.23 | 47 | 7.01 | 70 | 8.51 |
| 3 | 0.53 | 26 | 4.38 | 48 | 7.11 | 71 | 8.54 |
| 4 | 0.71 | 27 | 4.53 | 49 | 7.21 | 72 | 8.56 |
| 5 | 0.89 | 28 | 4.67 | 50 | 7.30 | 73 | 8.59 |
| 6 | 1.06 | 29 | 4.82 | 51 | 7.38 | 74 | 8.61 |
| 7 | 1.24 | 30 | 4.96 | 52 | 7.47 | 75 | 8.63 |
| 8 | 1.41 | 31 | 5.10 | 53 | 7.55 | 76 | 8.64 |
| 9 | 1.59 | 32 | 5.24 | 54 | 7.63 | 77 | 8.66 |
| 10 | 1.76 | 33 | 5.38 | 55 | 7.71 | 78 | 8.67 |
| 11 | 1.94 | 34 | 5.51 | 56 | 7.78 | 79 | 8.67 |
| 12 | 2.11 | 35 | 5.64 | 57 | 7.85 | 80 | 8.68 |
| 13 | 2.28 | 36 | 5.77 | 58 | 7.92 | 81 | 8.68 |
| 14 | 2.45 | 37 | 5.90 | 59 | 7.99 | 82 | 8.68 |
| 15 | 2.62 | 38 | 6.02 | 60 | 8.05 | 83 | 8.68 |
| 16 | 2.79 | 39 | 6.14 | 61 | 8.11 | 84 | 8.67 |
| 17 | 2.95 | 40 | 6.26 | 62 | 8.16 | 85 | 8.66 |
| 18 | 3.12 | 41 | 6.38 | 63 | 8.22 | 86 | 8.65 |
| 19 | 3.28 | 42 | 6.49 | 64 | 8.27 | 87 | 8.64 |
| 20 | 3.44 | 43 | 6.60 | 65 | 8.31 | 88 | 8.62 |
| 21 | 3.60 | 44 | 6.71 | 66 | 8.36 | 89 | 8.60 |
| 22 | 3.76 | 45 | 6.81 | 67 | 8.40 | 90 | 8.58 |
| 23 | 3.92 | 68 | 8.44 |  |  |  |  |

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| **Modified Polar Mount Tracking Angles NOTE:** Elevation Angle is the angle measured on (at) the pivot axis of the mount. To get the Total Declination Angle setting as measured on (at) the back of the dish ring (dish mount), add the Declination Offset Angle to the Elevation Angle. In summary, the difference between the Total Declination Angle and the Elevation Angle is the Declination Offset Angle. Elevation and Declination Angles are always measured and applied when the dish is at its zenith, i.e. highest point in the arc, when the dish axis is aligned along the true north-south line. |
| Footprints by Dish Size - Latitude Declination Chart - C/Ku-Band Satellite Listing |