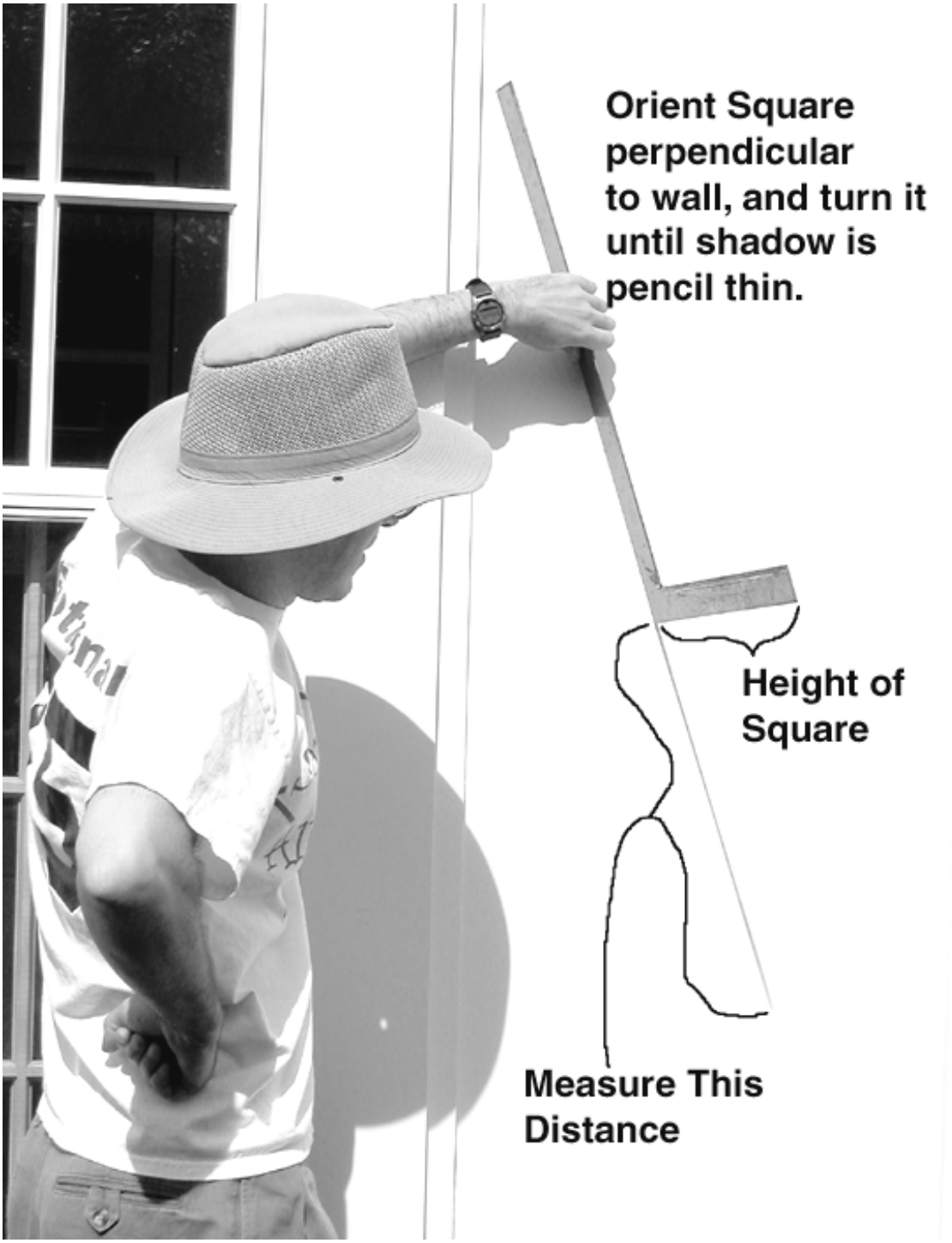
An Easy Way to Measure Wall Declination (corrected 10/6/02)

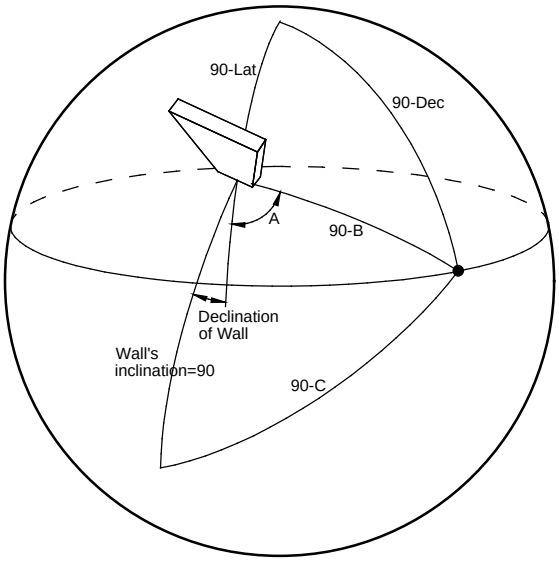


A=Sun's Azimuth (East is negative, West is positive)
B=Sun's Altitude
C=ArcTan(Height of Square/Length of Shadow)
Determine A and B for a given date and time from the NASS Compendium program. Or use MSWORKS spreadsheet WallDec.wpd, at www.precisionsundials.com

Wall Declination = A +/-ArcCos[Sin(C)/Cos(B)]

This gives 2 possible answers. If the correct one is not obvious, you must take a second reading at a different time. This method works only for vertical walls.

Bill Gottesman. CORRECTED 10/2002. www.precisionsundials.com



Azimuth is (-) toward East and (+) toward West

Wall Dec is (-) toward East, (+) toward West

A=Sun's Azimuth

B=Sun's Altitude

C=Sun's Altitude relative to the wall

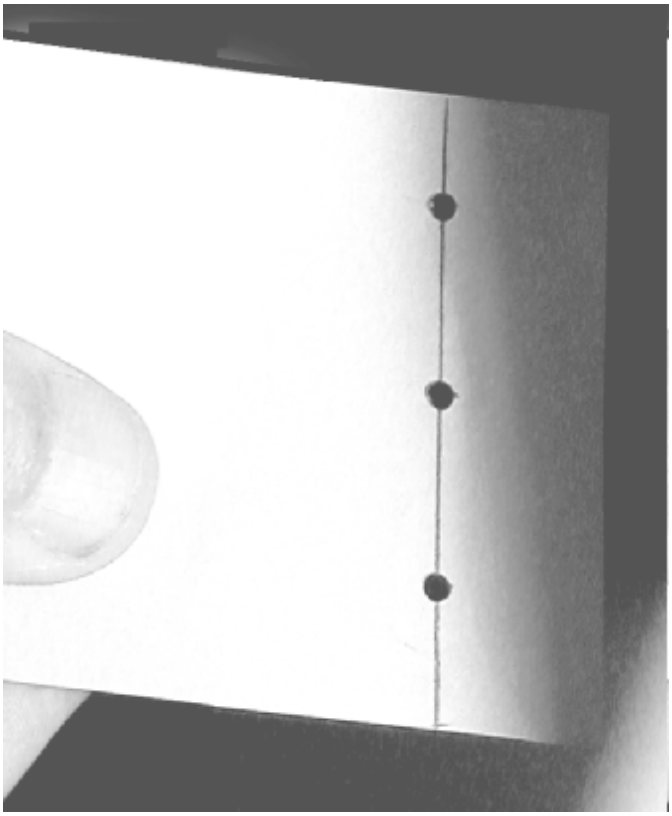
Cos(Wall declination - A)=[cos(90-C)-cos(90)*cos(90-B)]/[sin(90-B)*sin(90)]

Cos(Wall declination - A)=cos(90-C)/sin(90-B)

Cos(Wall declination - A)=sin(C)/cos(B)

Wall Declination = A +/-ArcCos[Sin(C)/Cos(B)]

The shadow sharpener below shows where to properly read the edge of a blurry shadow (The shadow cast by the carpenter's square is typically long enough to be blurry). The proper edge is the one where the shadow sharpener shows the sun to be halfway illuminated. This is farther from the shadow than most people expect.



Shadow Sharpener