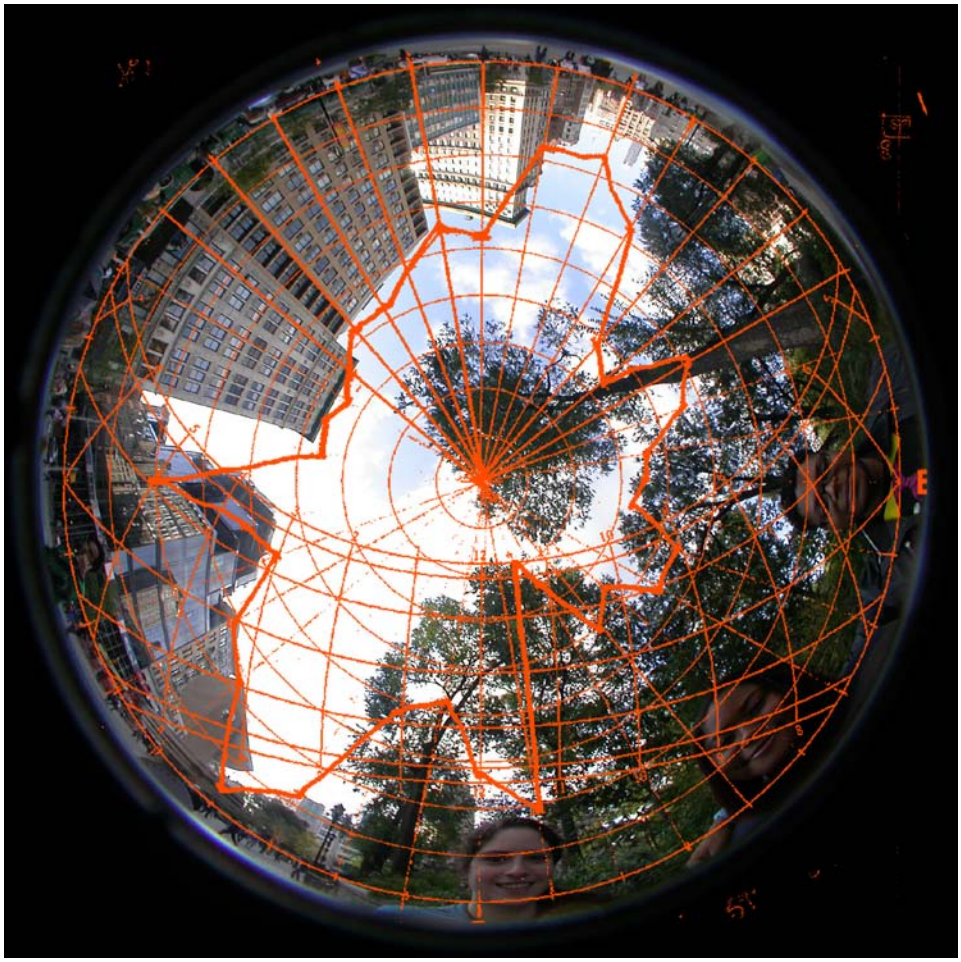
THE NEW SCHOOL PARSONS

ASSIGNMENT 2: Solar Path Diagram & Fisheye Overlay

Leveling
You can place the bubble level (it is in the camera bag) on top in order to level the lens before shooting.

Exposure compensation
Choose the right exposure.

Overlay
Flip the images (not 180 rotate, but rather mirror). Then adjust contrast / sharpen as preferred.
Scan student work. I make it red by this technique: scan black and white (not grey), select a black area, select similar, delete (after setting the background color to red or orange or whatever you want the SPD color to be). Then make a new layer, copy to the new layer, select white, select similar, delete. Now you have a red (or whatever color) overlay to paste over the fisheye photo.



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Solar Transit Exercise

CAUTION: DO NOT LOOK DIRECTLY AT THE SUN

Eye damage can occur by looking directly at the sun even if the observer is wearing sun glasses. Alternatively, a piece of white paper can be positioned behind the rear index; the instrument will be aligned with the sun when the shadows of the two indices (brads) appear as one on the paper.

1. Check Position for Solar Transit

1. Mount the Solar Transit on a tripod and place it outdoors.
2. Refer to the isogonic map of the United States and find the magnetic deviation for your area. Using the Solar Transit`s compass, and correcting for magnetic deviation, orient the Solar Transit base to face due South. The compass will point 13^0 west of true north.
3. Using the circular bubble level, adjust the Solar Transit so that its base is parallel to the ground plane.
4. Adjust the latitude semicircle to indicate your latitude (remember, the angles on this scale will be on the north side of the semicircle).
5. Calculate the correct solar time and set the hour scale to this value. Remember to adjust for daylight savings time if it is in effect.
6. Adjust the declination scale to the correct values for declination (in degrees) is located on the base of the Solar Transit.
7. The two sighting pins on the Solar Transit should now be in line with the sun. If your transit is not aligned review the procedure again.

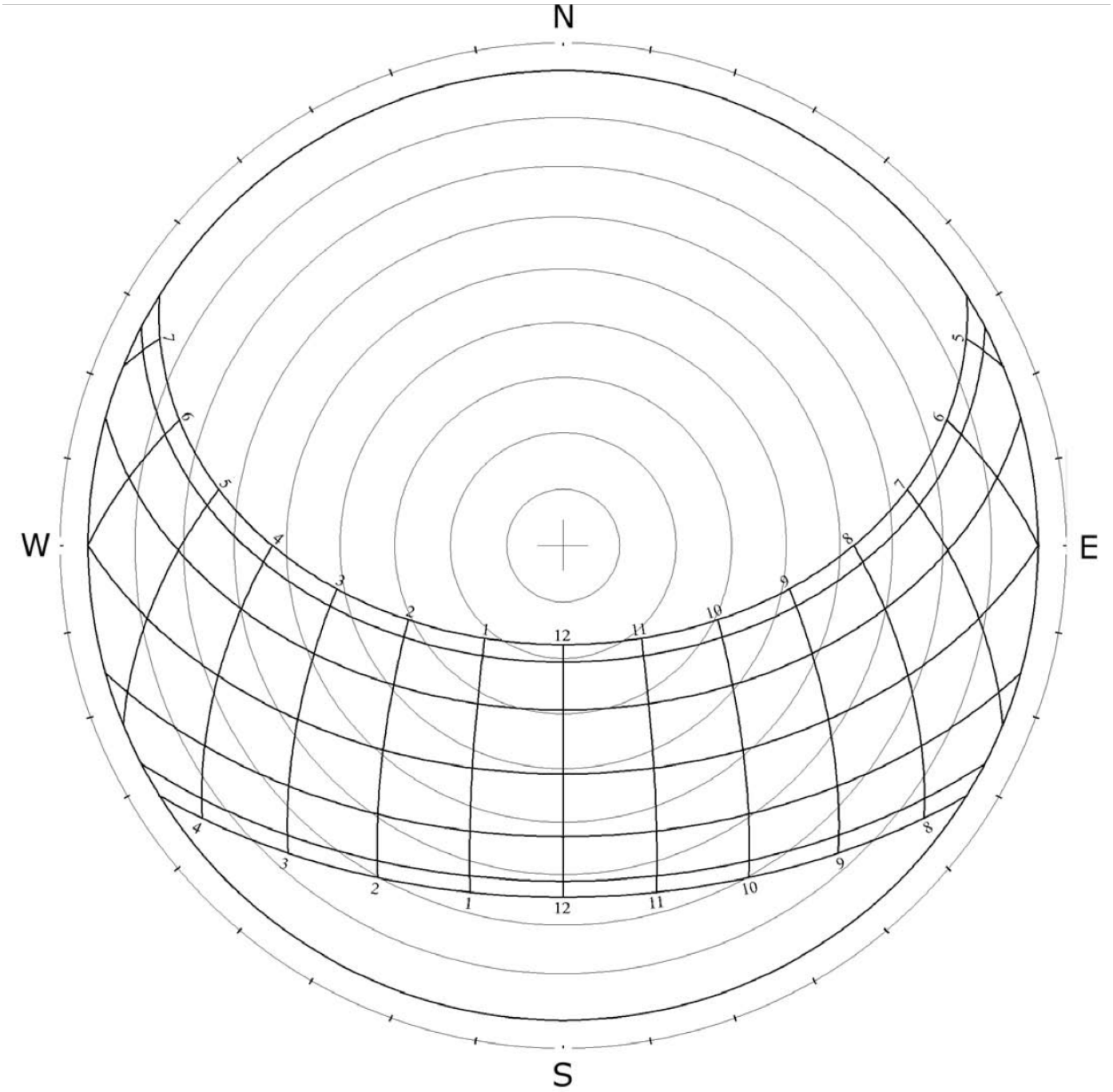
2. Visually Track the Sun`s Path

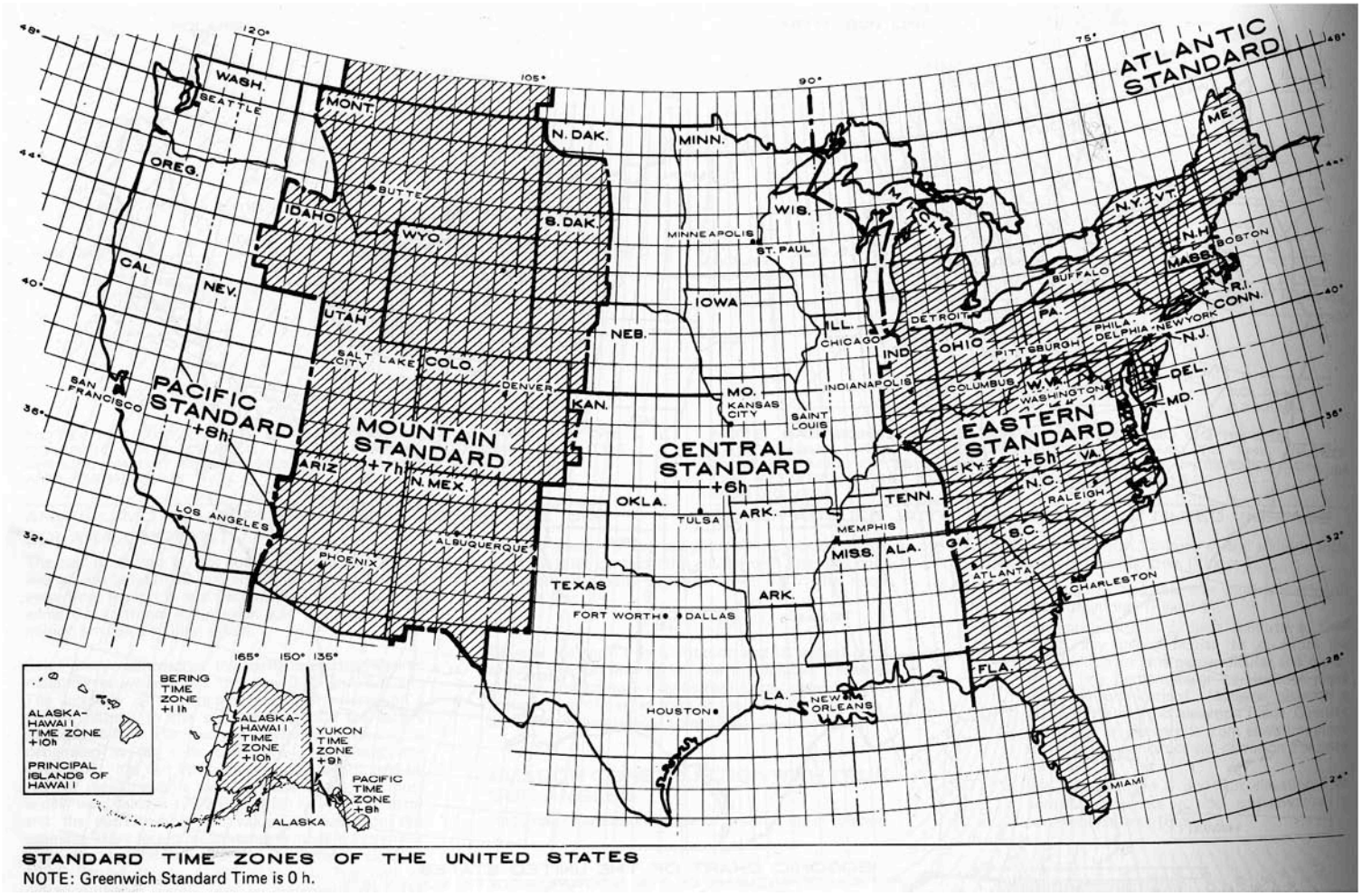
1. Keep the Solar Transit`s position
2. Use the Solar Transit to visually track the sun`s path for the **winter solstice** and record the hours of sunrise and sunset over your specific horizon. In addition note the altitude and azimuth angle of the sun at noon.

3. Use the Solar Transit to visually track the sun`s path for the **summer solstice** and record the hours of sunrise and sunset over your specific horizon. In addition note the altitude and azimuth angle of the sun at noon.

3. Horizon Survey Procedure

1. Keep the Solar Transit`s position.
2. Adjust the angle of the latitude semicircle to 90^0 and tighten securely.
3. For each horizon obstruction, adjust the azimuth and altitude circles until the pointers align on the top of the obstruction. Record discrete corners or points of the obstruction by designating their altitude and azimuth bearing and record them on the Sun Path Diagram below.

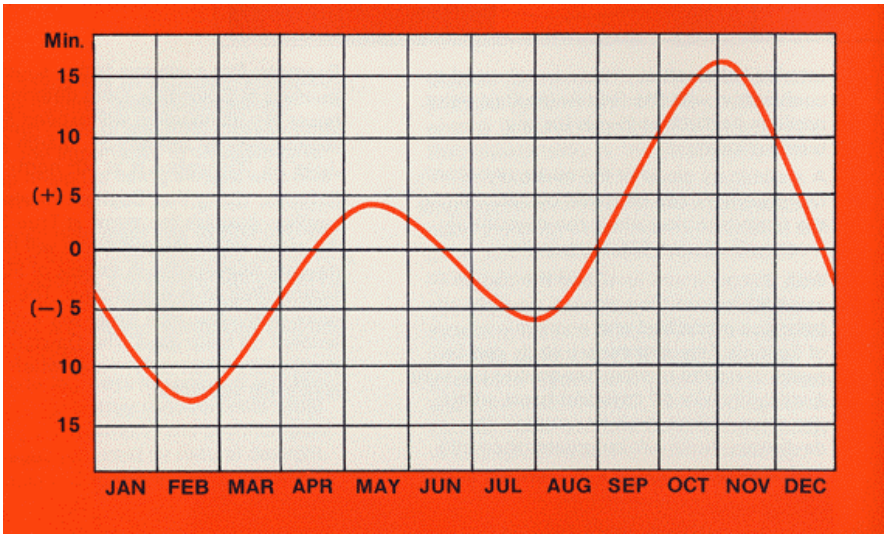




STANDARD TIME ZONES OF THE UNITED STATES
NOTE: Greenwich Standard Time is 0 h.

Local Solar time is simply the local clock time adjusted for these factors:

Equation of Time



AST = LST + ET + [4 x (LSM - LON)]

AST: apparent solar Time

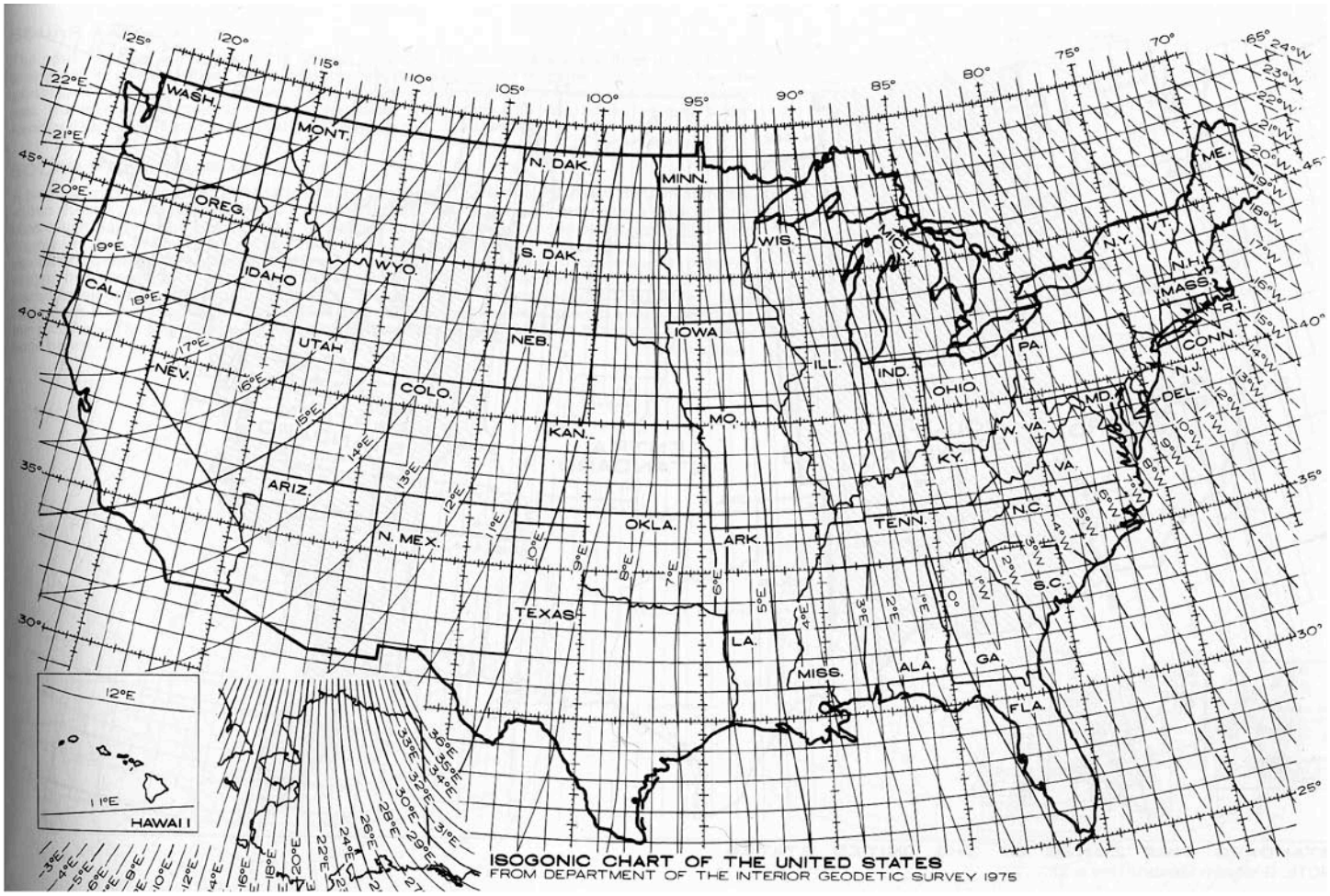
LST: local standard time

ET (Eq. of Time (min), read off the dashed line on graph above, in minutes):

LSM: local standard time meridian (degree of arc)

LON: local longitudes (degree of arc)

4: minutes of time required for 1° rotation of earth



Source: Architectural Graphic Standards

COMPASS ORIENTATION

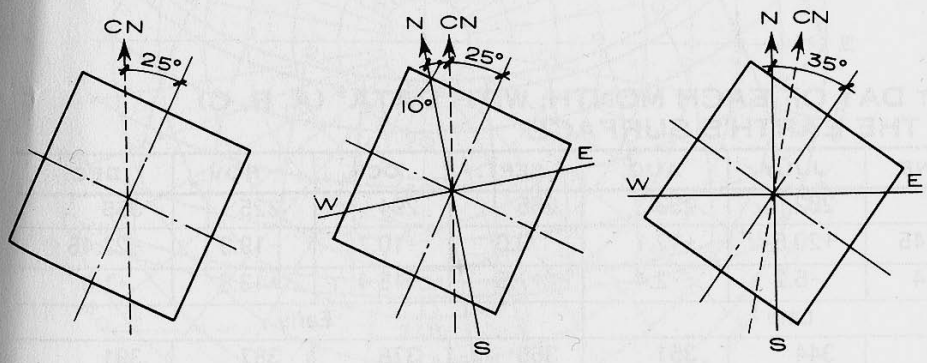
The above map is the isogonic chart of the United States. The wavy lines from top to bottom show the compass variations from the true north. At the lines marked E the compass will point east of true north; at those marked W the compass will point west of true north. According to the location, correction should be done from the compass north to find the true north.

EXAMPLE: On a site in Wichita, Kansas, find the true north.

STEP 1. Find the compass orientation on the site.

STEP 2. Locate Wichita on the map. The nearest compass variation is the 10^{o}E line.

STEP 3. Adjust the orientation correction to true north.
The graphical example illustrates a building which lies 25^{o} east with its axis from the compass orientation.



1. COMPASS ORIENTATION

2. COMPASS VARIATION

3. ORIENTATION CORRECTION