

# Sundial and Wobble Indicator

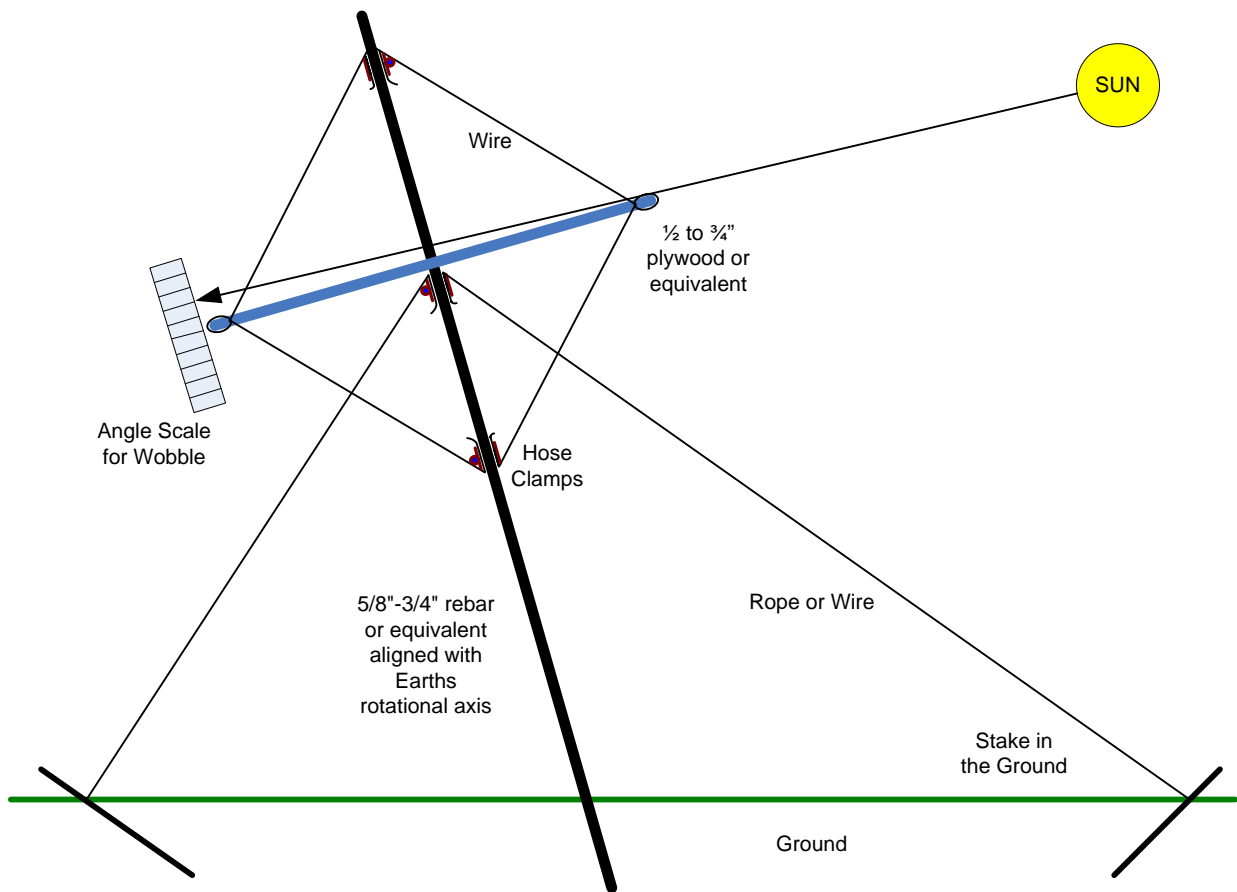
(5/5/2016)

## How to construct a simple way to measure earth's wobble and sun time of day (or to indicate stopped rotation of the earth around it's axis).

See that following drawing note that the center pole is held by 4 guy wires anchored to the earth. Adjust one guy wire and the opposite at the same time when the sun light is close to being parallel to opposite stakes. Adjust at 6 hr (or 90 degree) intervals the angle of the pole until minimum width shadow is observed for the circular plywood.

The center pole is chosen thin enough to flex and allow adjustment once hammered into the ground. Ply wood or particle board could be used for the circular shadow maker for wobble indication. The center pole makes the shadow for the time of day scale measurements.

Wrap a wire through the hole and around the plywood several times so it doesn't slip. For locations close to the equator may need to use a bent stiffer center pole. One can look up the elevation of the sun at your location and determine more accurately the angle of the pole.



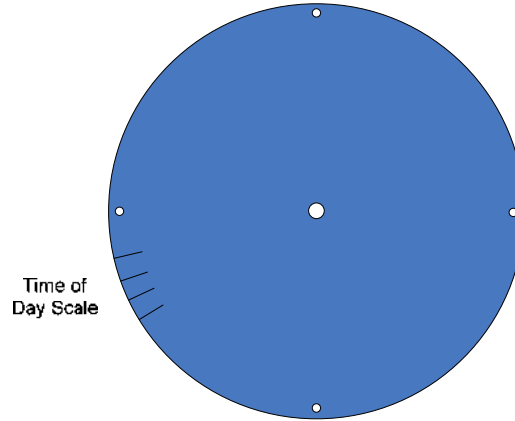
### Simple Sundial and Wobble Indicator Construction

If the shadow circular plywood is wired perpendicular to the board then the center pole can accurately be used to measure time. For locations very close to the equator one may need to mount the plywood at an angle to the pole this is your choice as needed to make the center pole work.

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(5/5/2016)

The following is a top view of the plywood shadow maker. The time of day scale can be on the top and/or the bottom of the plywood as needed. The diameter can be made to any size. The bigger the more accurate and harder to get lined up with the sun and the easier to be caught in the wind and the stronger the center pole will need to be. The center of the shadow made by the center pole is used to indicate time of day.



Top View of Plywood Shadow Maker

The following scales can be used to make this unit if the size of the circular shadow maker is 12", 18", or 24" or bigger in diameter.

Use the 10.5" diameter scale to use with the 12" plywood shadow maker. This allows .75" on either side for a hole for the wire. Use the 16" diameter scale to use with the 18" plywood shadow maker. This allows 1" on either side for a hole for the wire. Use the 21" diameter scale to use with the 24" plywood shadow maker. This allows 1.5" on either side for a hole for the wire. Anything bigger use the 21" scale or find a large printer. One can laminate this scale to a thin sheet of acrylic plastic. In a pinch clear plastic 2" wide box making tape can be used to laminate it to either the plywood or a plastic sheet. If laminated to a thin sheet of some kind it can be moved to pivot around the center pole and line up with the sun after installing of the rest of the unit.

The wobble scale degree measuring scales for 12", 18", 24" and 36" are able to be printed out on 8.5" paper at 100 percent and taped together. This scale can then be taped to something stiff for use. It can be used to 40 degrees in an up direction or 40 degrees down from the plywood shadow maker. If more angle is needed tape on more of the same scale and renumber it. The proper length of each scale for 100 percent printing is measured from "0 line" to "40 degree line" and is found in the following table.

Unit of measure in inches		
Diameter	Decimal	To 1/16"
12	8.74	8 & 12/16
18	13.10	13 & 2/16
24	17.47	17 & 8/16
36	26.21	26 & 3/16

Degrees For  
12" Diameter

0  
1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
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25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40

Degrees For  
18" Diameter

0  
1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27

Degrees For  
24" Diameter

0  
1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20

Degrees For  
36" Diameter

0  
1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13

Degrees For  
18" Diameter

—24—  
—25—  
—26—  
—27—  
—28—  
—29—  
**—30—**  
—31—  
—32—  
—33—  
—34—  
—35—  
—36—  
—37—  
—38—  
—39—  
**—40—**

Degrees For  
24" Diameter

—19—  
**—20—**  
—21—  
—22—  
—23—  
—24—  
—25—  
—26—  
—27—  
—28—  
—29—  
**—30—**  
—31—  
—32—  
—33—  
—34—  
—35—  
—36—  
—37—  
—38—  
—39—  
**—40—**

Degrees For  
36" Diameter

—13—  
—14—  
—15—  
—16—  
—17—  
—18—  
—19—  
**—20—**  
—21—  
—22—  
—23—  
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—36—

—37—

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—39—

—40—

# Solar Dial Hour Scale

Print on 8.5" x 11" at 65% for 10.5"

Print on 8.5" x 11" at 100% for 16"

Print on 11" x 17" at 130 % for 21"

