



HELIOSPHERE[®]

ARC

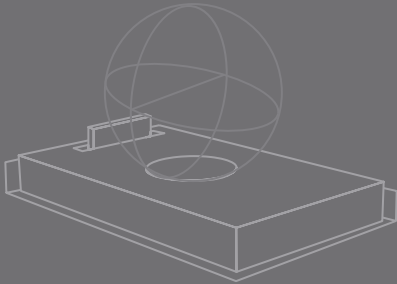
SETUP AND SEASONAL ADJUSTMENTS MANUAL

SOLAR
TIMEPIECE

WELCOME / CARE OF YOUR HELIOSPHERE

WELCOME TO EXPERIENCING SOLAR TIME FOR YOUR SPECIFIC SPOT ON THE GLOBE WITH YOUR HELIOSPHERE DESIGNS SUNDIAL

Before starting, you may use the lid of your HELIOSPHERE box as a temporary landing pad for your HELIOSPHERE while you read through this manual.



CARING FOR YOUR HELIOSPHERE TIMEPIECE

To help prevent scratches and fingerprints, take care when handling or aligning your HELIOSPHERE sundial by always using the microfiber cloth provided. Always use a clean cloth and avoid rubbing dirt on the surface as this can cause scratches.

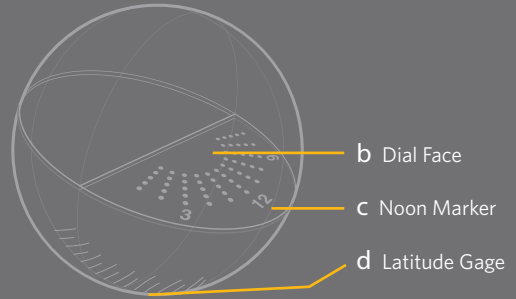
Never clean your HELIOSPHERE with any abrasive paper goods or ammonia, baking soda, or bleach based cleaning products.

This timepiece is not intended for children under 12 years in age. Adult supervision is required for all use.

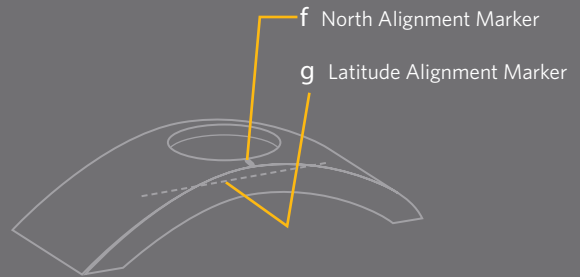
With normal use as provided in your set-up manual, the HELIOSPHERE sundial carries a one year limited warranty on workmanship and materials. (see pg. 16, 17 for details)

PARTS OF YOUR HELIOSPHERE

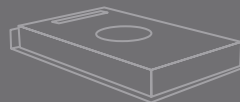
a HELIOSPHERE



e ARC BASE



h TEMPORARY LANDING PAD



Invert box lid

i MICROFIBER CLOTH



HELIOSPHERE OVERVIEW

About HELIOSPHERE

The HELIOSPHERE can be enjoyed by sundial novices and aficionados alike. The HELIOSPHERE evolved not only as a solar timepiece but also as a design element intended to evoke delight and to elicit connections with time and place.

Any area receiving direct sunlight would benefit from this sculptural solar instrument that brings a pattern of light as well as an understanding of one's location within our solar system that makes this light possible.

It is hoped that you will enjoy experiencing the seasonal patterns of living light to connect with your specific spot on our globe.

The HELIOSPHERE can be rotated within its base unit to match your site's specific location to indicate the time of day. As a reliable timepiece, the HELIOSPHERE displays a pattern of light on the dialface that varies with the season. Accuracy is legible to the quarter hour and can improve with experience in observing the pattern light. Solar time can also be converted to standard time or daylight savings time.

For a quick set up, and to begin experiencing the patterns of light on your HELIOSPHERE, follow the guidelines outlined in part one. To further appreciate our relationship to time, follow the guidelines for converting solar time to clock time as outlined in part two.

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*Note: The HELIOSPHERE dial face is designed and this "equation of time" is intended for use in the Western Hemisphere, North of the Equator.
For assistance in adjusting your HELIOSPHERE in other parts of the world visit: heliospheredesigns.com*

SYSTEM REQUIREMENTS

What you need before starting.

To set up your HELIOSPHERE sundial will require several important parameters (you may write your specific figures into boxes provided on pages 5, 6, 12).

For additional help determining these parameters visit:

HELIOSPHEREDESIGNS.COM

FINDING NORTH



Find Magnetic North using a compass. Once found, correct your compass to reflect a True North heading. A listing of easterly and westerly magnetic variations is shown below for various US cities.

City	Magnetic Variation
Boston, MA	15° W
New York City, NY	13° W
Washington DC	11° W
Jacksonville, FL	6° W
Chicago, IL	4° W
Memphis, TN	1° W
Houston, TX	3° E
Denver, CO	9° E
Phoenix, AZ	11° E
Los Angeles, CA	12° E
San Francisco, CA	14° E
Seattle, WA	17° E
Anchorage, AK	18° E
Honolulu, HI	10° E

FINDING TRUE NORTH

Using a compass is not completely accurate, therefore you may want to adjust your compass to True North. First, locate the North Star (the last star in the handle of the little dipper constellation). This can be found by tracing a line from the last two stars in the cup of the Big Dipper.



J North / South Axis



Note: You may wish to select a landmark along your North / South Axis for ease in finding North in the future or during the day.

FINDING LATITUDE & LONGITUDE

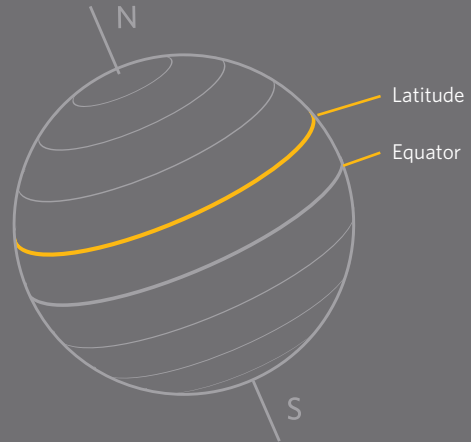
K Your Latitude

L Your Longitude

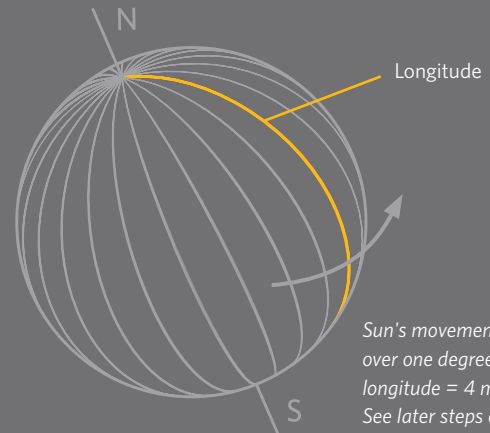
Approximate locations of some US cities (listed East to West)

City	Lat.	Long.
Boston, MA	42.3 N	71.1 W
New York City, NY	40.7 N	74.0 W
Washington DC	38.9 N	77.0 W
Jacksonville, FL	30.3 N	81.6 W
Chicago, IL	41.9 N	87.6 W
Memphis, TN	35.1 N	90.0 W
Houston, TX	29.8 N	95.3 W
Denver, CO	39.7 N	105.0 W
Phoenix, AZ	33.5 N	112.0 W
Los Angeles, CA	34.0 N	118.2 W
Seattle, WA	47.6 N	122.3 W
San Francisco, CA	37.7 N	122.4 W
Anchorage, AK	61.2 N	149.9 W
Honolulu, HI	21.3 N	157.9 W

K LATITUDE



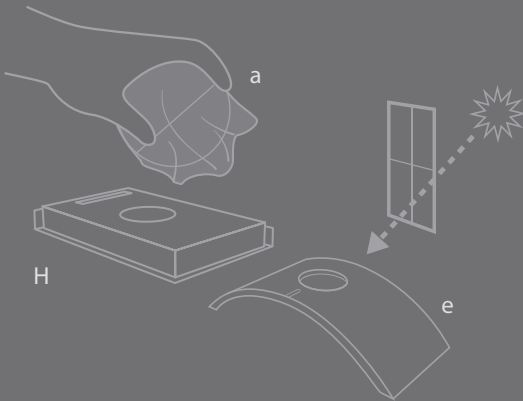
L LONGITUDE



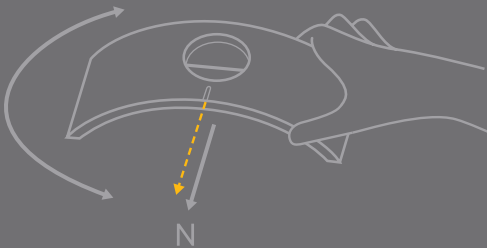
Sun's movement over one degree of longitude = 4 minutes. See later steps on pages 12-15 that reference this movement in the equation of time.

NORTH ALIGNMENT

- 1 Remove the Arc Base **e** provided in your packing kit.
- 2 Place the wrapped HELIOSPHERE **a** on the temporary "foam" Landing Pad **h** while you prepare for the alignment of your Arc Base **e**.

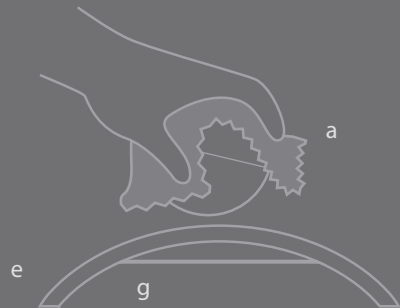


- 3 Place the Arc Base **e** in a sunny window or spot that receives direct sunlight
- 4 Orient your Arc Base **e** by aligning the North Alignment Marker **f** with your North/South Axis **j**.

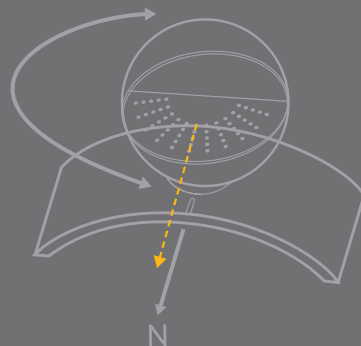


NORTH ALIGNMENT & SOLAR NOON

- 5 Carefully unwrap your HELIOSPHERE **a** and using the Microfiber Cloth **i** place it onto the base.



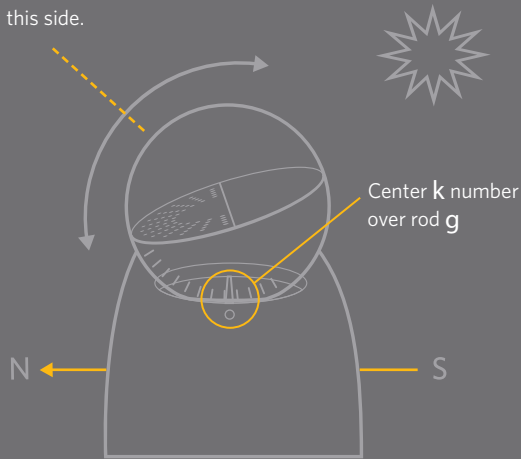
- 6 Align the Noon Marker **c** with the North Alignment Marker **f** on the base.



LATITUDE ALIGNMENT

7 Carefully rotate the HELIOSPHERE **a** to align the Latitude Gage **d** with your location's Latitude **k**, by centering that number over Latitude Alignment Marker **g**.

View from this side.



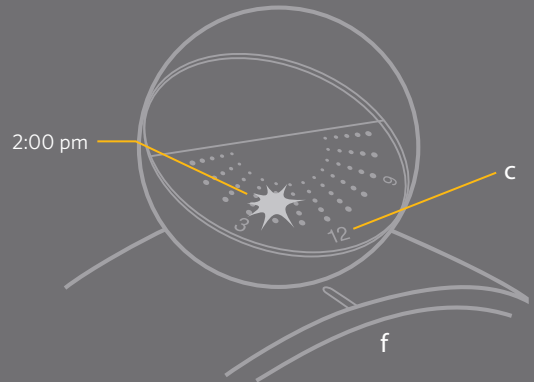
As a sculptural solar timepiece, you may enjoy witnessing Solar Time on your HELIOSPHERE, with its moving patterns of light in conjunction with the ever changing rhythm of the seasons.

EXPERIENCING SOLAR TIME

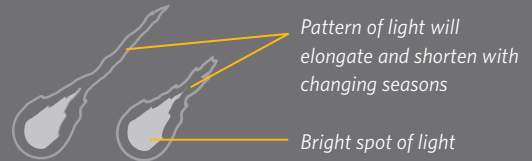
Reading your HELIOSPHERE

YOU ARE NOW SET TO ENGAGE IN YOUR EXPERIENCE OF SOLAR TIME.

8 Look for a bright spot of light on Dial Face **b**.



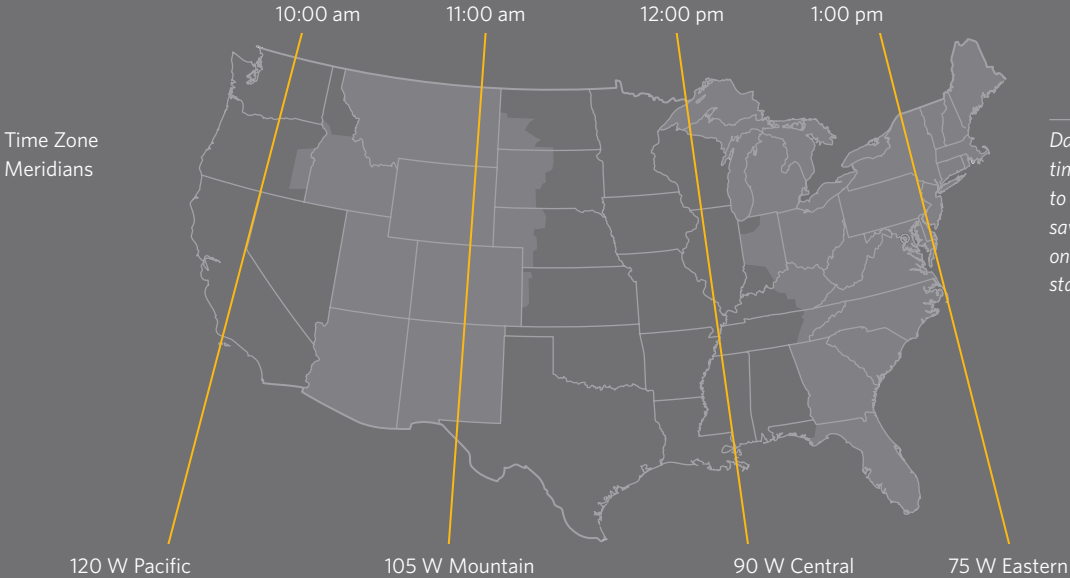
Fine Tuning: Witnessing Patterns of Living Lights



With experience in viewing your HELIOSPHERE, you may recognize a distinctive tear drop pattern of light illuminating the dialface. Depending on your specific atmospheric conditions you may need to fine tune your true north/south alignment to achieve the greatest clarity in the visible shape of light.

CONVERTING SOLAR TIME FOR YOUR TIME ZONE

Until the invention of railroads and the telegraph, each city kept its own local mean solar time. Clocks today are set to the local time zones shown below. Each time zone brackets a "time meridian" (longitude) defined around the world at 15 degree intervals of longitude.



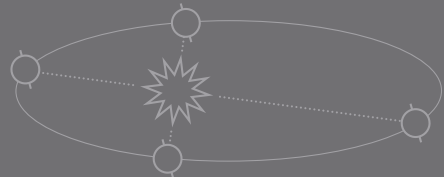
Daylight savings time adjustment: to find daylight savings, add one hour to standard time.

m Your Time Zone Meridian

Equation for **SOLAR TIME** → **STANDARD TIME**

Standard time = Solar Time (As Witnessed on your sundial) - 4x (Time Zone Meridian **m** - Location's Longitude **l**) - Seasonal Variation noted in Seasonal Diagram (See page 14-15)

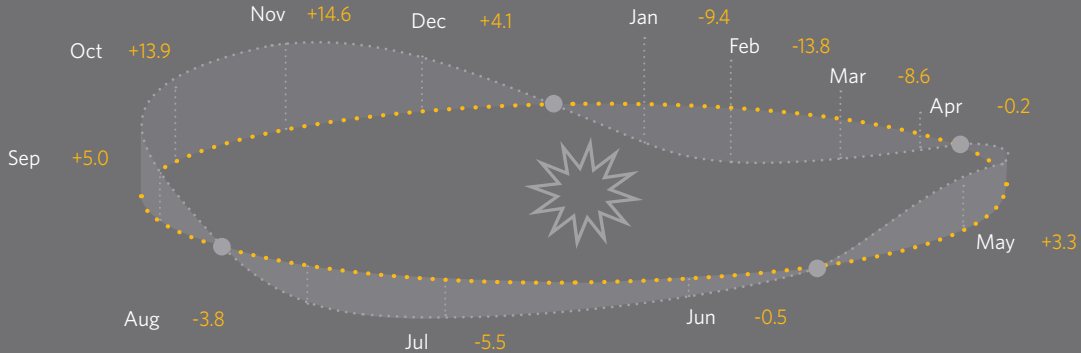
CONVERTING SOLAR TIME FOR THE SEASON



As the Earth speeds up or slows down in its elliptical orbit, add or subtract the seasonal variation to convert solar time to standard time. See averaged monthly seasonal variation values and equation examples on following page.

AVERAGED MONTHLY SEASONAL VARIATIONS

(in minutes)



CONVERSION EXAMPLES

SALT LAKE CITY / November

Latitude: 40.8 N Longitude: 111.9 W

Mountain time zone meridian: 105 W

$$\begin{aligned}\text{Standard Time} &= \text{Solar Time} - (4 \times (\text{Mountain Time Zone Meridian} - \text{Longitude})) - (\text{Seasonal variation for Nov.}) \\ &= \text{Solar Time} - (4 \times (105 - 111.9)) - (+14.6) \\ &= \text{Solar Time} - 4 \times (-6.9) - 14.6 \\ &= \text{Solar Time} + 27.6 - 14.6 \\ &= \text{Solar Time} + 13 \text{ minutes}\end{aligned}$$

CHICAGO / February

Latitude: 41.9 N Longitude: 87.6 W

Central time zone meridian: 90 W

$$\begin{aligned}\text{Standard Time} &= \text{Solar Time} - (4 \times (\text{Central Time Zone Meridian} - \text{Longitude})) - (\text{Seasonal variation for Feb.}) \\ &= \text{Solar Time} - (4 \times (90 - 87.6)) - (-13.8) \\ &= \text{Solar Time} - 4 \times (2.4) + 13.8 \\ &= \text{Solar Time} - 9.6 + 13.8 \\ &= \text{Solar Time} + 4.2 \\ &\approx \text{Solar Time} + 4 \text{ minutes}\end{aligned}$$

NEW YORK CITY / June

Latitude: 40.7 N Longitude: 74.0 W

Eastern time zone meridian: 75 W

$$\begin{aligned}\text{Standard Time} &= \text{Solar Time} - (4 \times (\text{Eastern Time Zone Meridian} - \text{Longitude})) - (\text{Seasonal variation for June}) \\ &= \text{Solar Time} - (4 \times (75 - 74.0)) - (-0.5) \\ &= \text{Solar Time} - 4 \times (1.0) + 0.5 \\ &= \text{Solar Time} - 4.0 + 0.5 \\ &= \text{Solar Time} - 3.5 \\ &\approx \text{Solar Time} - 3 \text{ minutes}\end{aligned}$$

LOS ANGELES / August

Latitude: 34.0 N Longitude: 118.2 W

Pacific time zone meridian: 120 W

$$\begin{aligned}\text{Standard Time} &= \text{Solar Time} - (4 \times (\text{Pacific Time Zone Meridian} - \text{Longitude})) - (\text{Seasonal variation for Aug.}) \\ &= \text{Solar Time} - (4 \times (120 - 118.2)) - (-3.8) \\ &= \text{Solar Time} - 4 \times (1.8) + 3.8 \\ &= \text{Solar Time} - 7.2 + 3.8 \\ &= \text{Solar Time} - 3.4 \\ &\approx \text{Solar Time} - 3 \text{ minutes}\end{aligned}$$

LIMITED WARRANTY

Heliosphere Designs warrants to the initial purchaser (hereinafter, “you” or “your”) only that the HELIOSPHERE sundial will be free of material defects in material and workmanship for a period of twelve months from your purchase of the sundial. Heliosphere Designs, in its sole discretion, will repair, replace, or refund the amounts paid by you for sundials not meeting the above warranty if the warranty claim is received by Heliosphere Designs within the warranty period. Notwithstanding the foregoing, modifications or alterations to the sundials without Heliosphere Designs’ prior written consent will automatically void any and all warranties, whether expressed or implied, for such sundials. Additionally, this warranty shall not cover any damage or condition determined by Heliosphere Designs to be caused by carelessness, negligence, misuse, normal wear and tear, failure to properly maintain the sundials, unauthorized repairs or modifications, or failure to use the sundials in accordance with Heliosphere Designs’ instructions.

All warranty claims must be submitted in writing to:

Heliosphere Designs, LLC
PO Box 10418
Bainbridge Island, WA 98110

HELIOSPHERE DESIGNS’ OBLIGATIONS WITH RESPECT TO THE SUNDIALS PURCHASED BY YOU ARE STRICTLY LIMITED TO THE LIMITED WARRANTY SET FORTH ABOVE (THE “WARRANTY”). REPAIR, REPLACEMENT OR REFUND OF AMOUNTS PAID, AS SET FORTH IN THE WARRANTY, IS HELIOSPHERE DESIGNS’ SOLE OBLIGATION AND YOUR SOLE AND EXCLUSIVE REMEDY WITH RESPECT TO THE HELIOSPHERE DESIGNS’ BREACH OF WARRANTY. EXCEPT AS EXPRESSLY SET FORTH IN THE WARRANTY, TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, THE SUNDIALS PURCHASED FROM HELIOSPHERE DESIGNS ARE PROVIDED ON AN “AS IS” BASIS AND HELIOSPHERE DESIGNS MAKES NO REPRESENTATIONS OR WARRANTIES CONCERNING THE SUNDIALS OR OTHERWISE IN CONNECTION WITH YOUR PURCHASE

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THE TIMEPIECE IS NOT INTENDED FOR USE BY CHILDREN UNDER 12 YEARS IN AGE. ADULT SUPERVISION IS REQUIRED FOR ALL USE.

CONNECT WITH SOLAR TIME

With **connections** ...
comes a sense of place

with a **sense** of place ...
comes a shift in perspective

with a **shift** in perspective ...
comes new ideas.

US Pat No 7,950,159

US Pat No 8,091,245

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