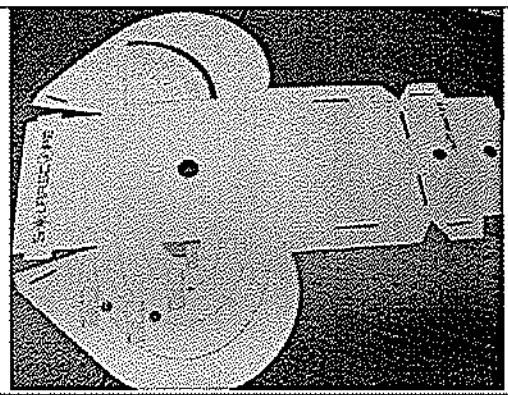
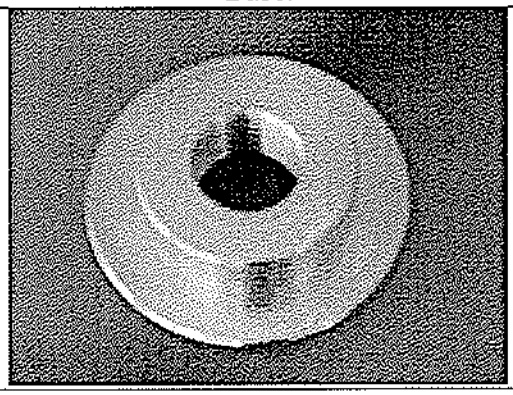
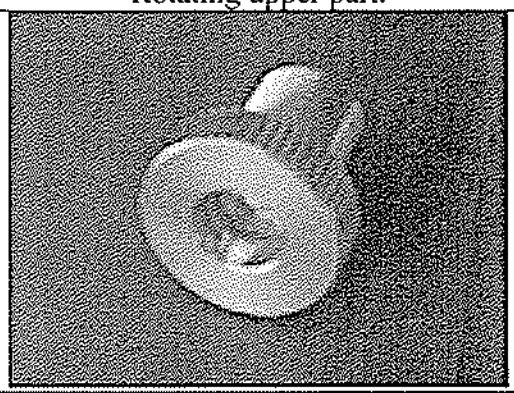
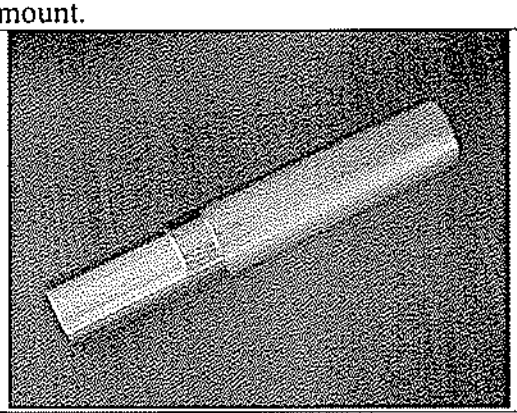
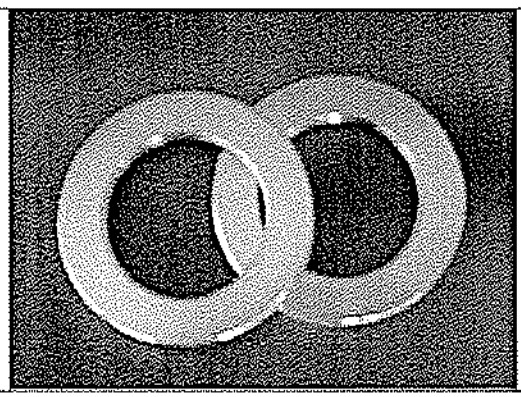
SOLARSCOPE

USER'S GUIDE :

1°) List of Solarscope's components:

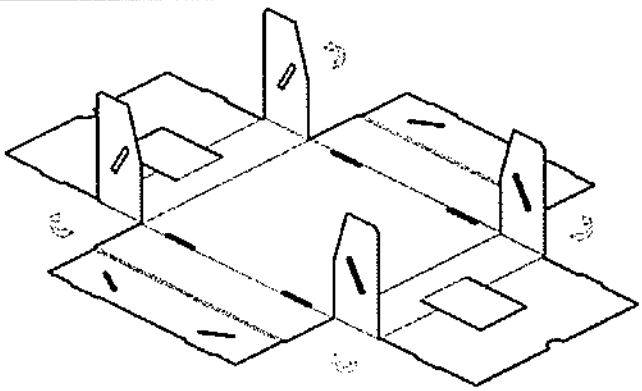
	
Base.	Rotating upper part.
	
Component A : Support for the mirror mount.	Component B : mirror mount.
	
Component C : lens tube.	Component D : 2 rings used to fix the lens tube.

2°) How to build it?

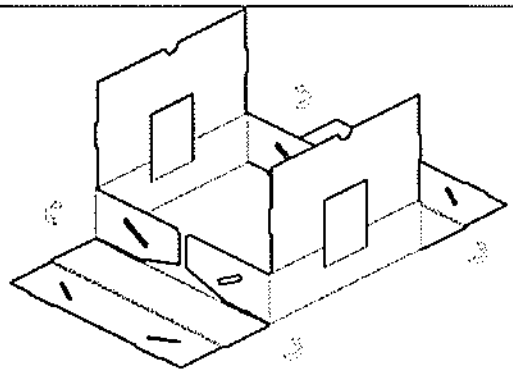
Done in five to ten minutes!

Follow carefully the 12 steps described bellow:

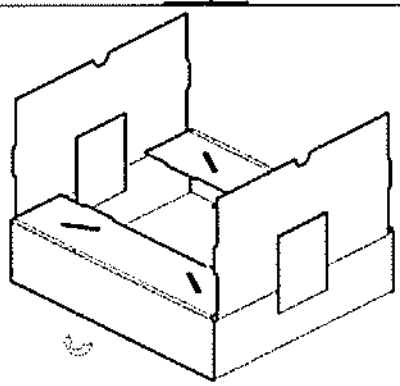
Steps 1 to 5 : Setting of base (base of Solarscope) :



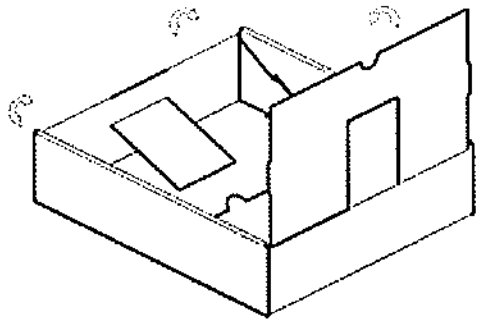
Step 1



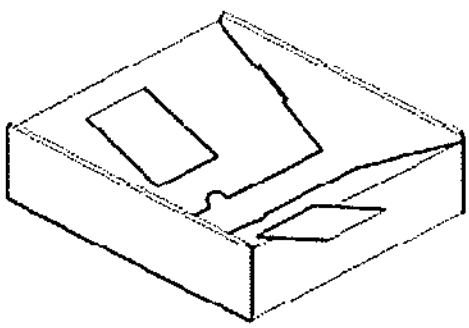
Step 2



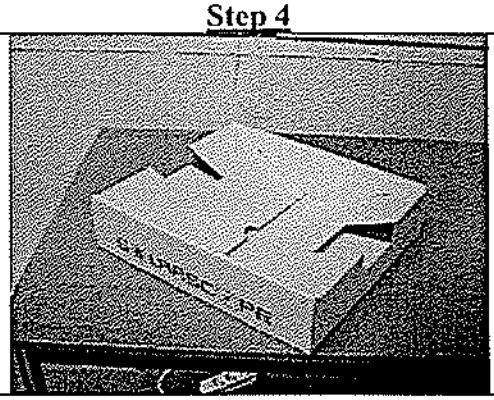
Step 3



Step 4



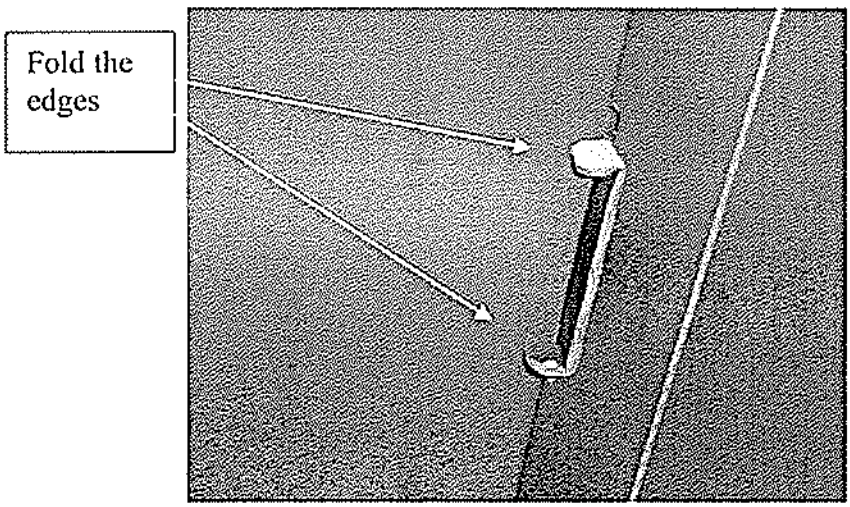
Step 5

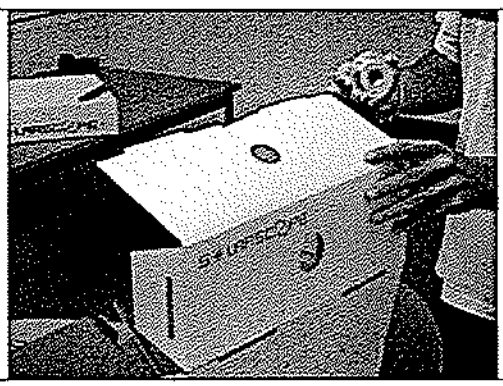


What it looks like when it's done

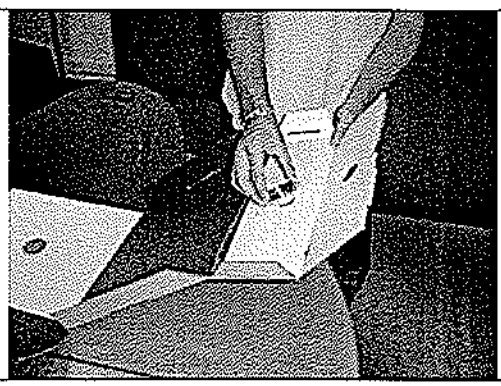
Steps 6 to 13: How to build the upper part of the Solarscope :

N.B. : As indicated in the picture bellow we advise you to fold the cardboard's edges in order to assemble Solarscope correctly.

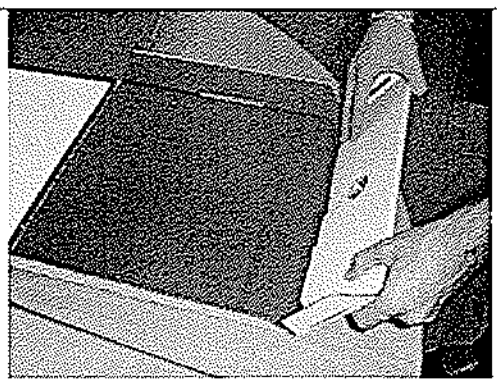




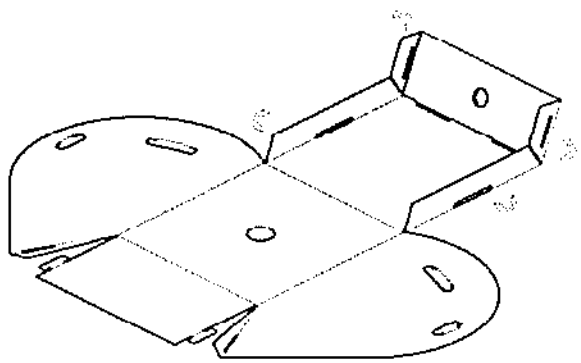
Step 6
component A's position



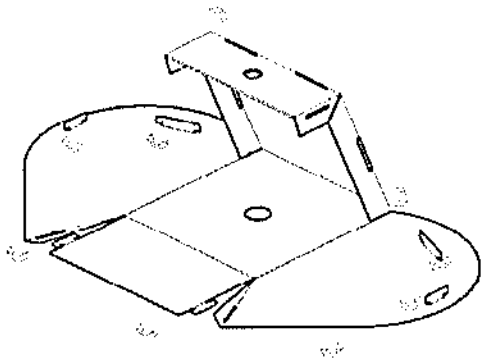
Step 7
The cylinder's largest part (component A) must be positioned on the top.



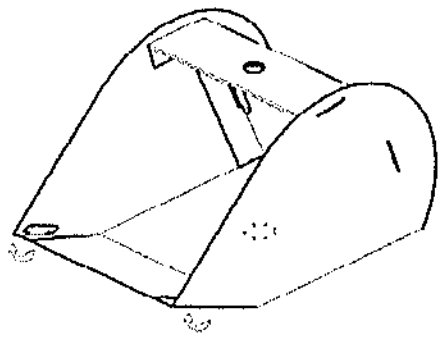
Step 8



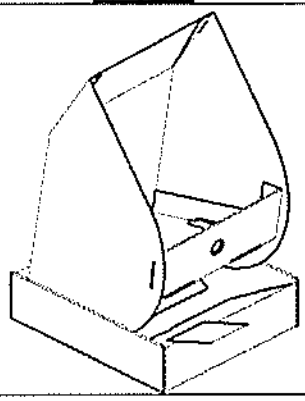
Step 9



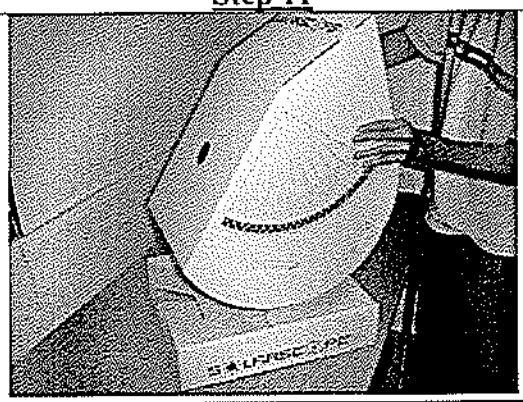
Step 10



Step 11

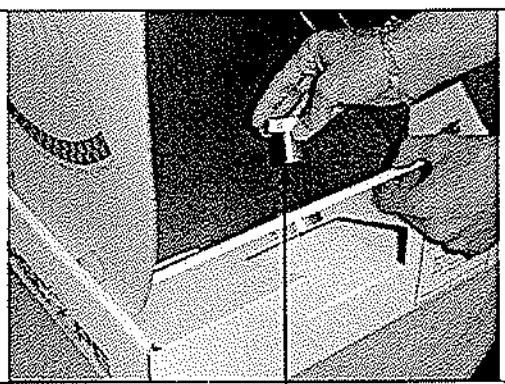


Step 12
Position of rotating upper part in the base.

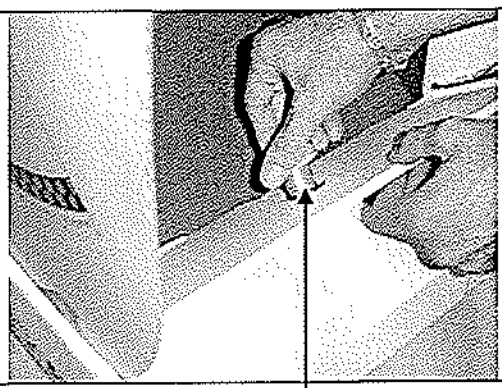


Step 13 : Solarscope fully assembled

Step 14: How to fix the mirror's adjustment set:

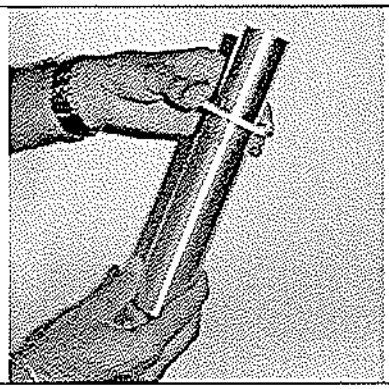
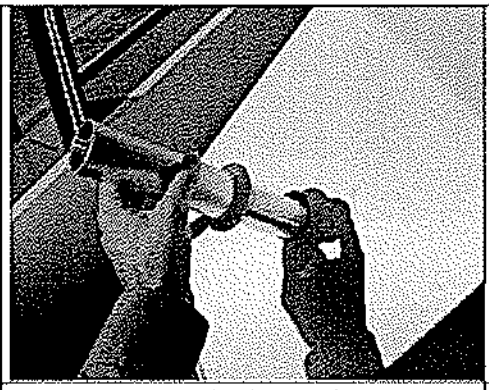


Take the mirror mount (component B)



Component B must be screwed in component A

Step 15: How to fix the lens tube :

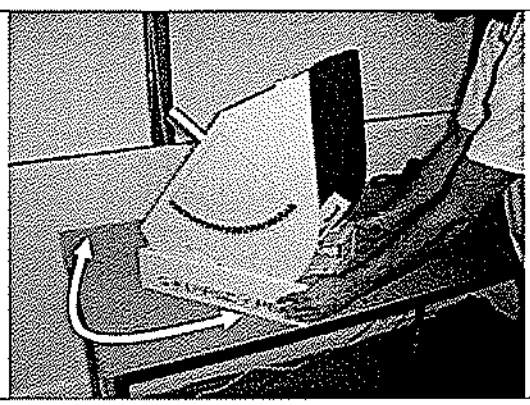
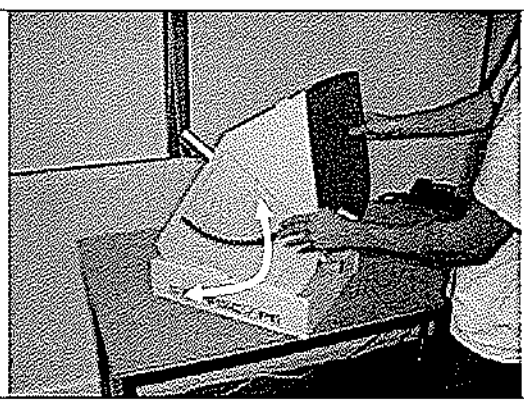
		
Screw one of the two rings until the last notch	insert the lens tube (component C)	Screw the second ring until component C is fully maintained

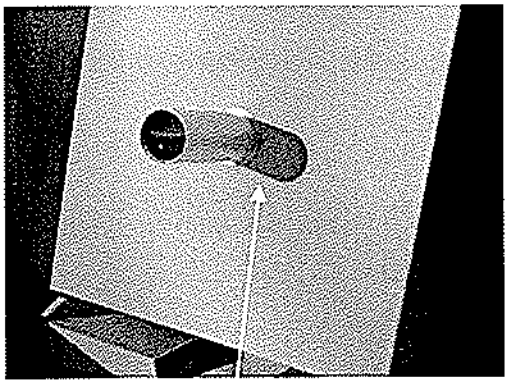
Solarscope is ready to work!

3°) How to visualise the picture of the sun ?

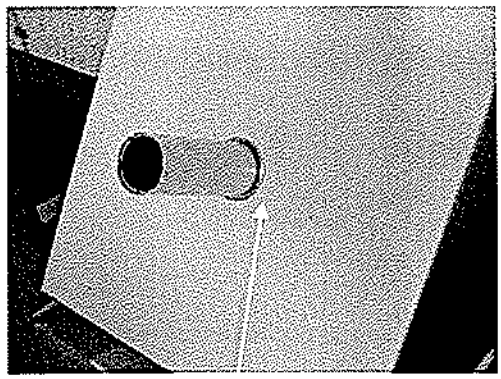
❶ Set the Solarscope facing the sun

❷ Solarscope must be oriented in order not to have any shadow at the level of the lens tube:

	
Move the base horizontally	Move the upper part vertically

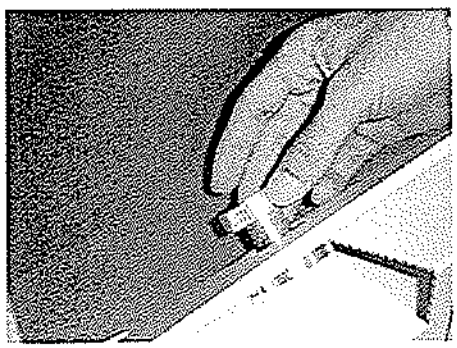


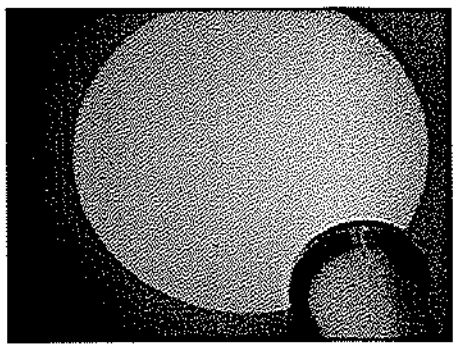
Solarscope in bad position
(Shadow)



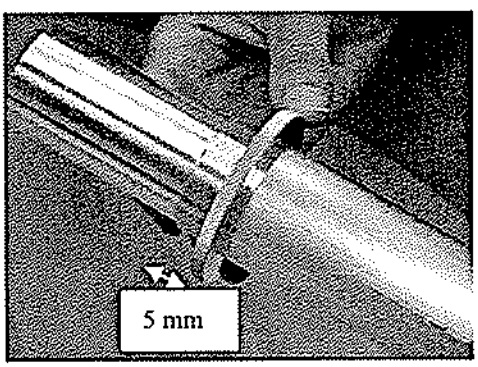
Solarscope in good position
(no shadow)

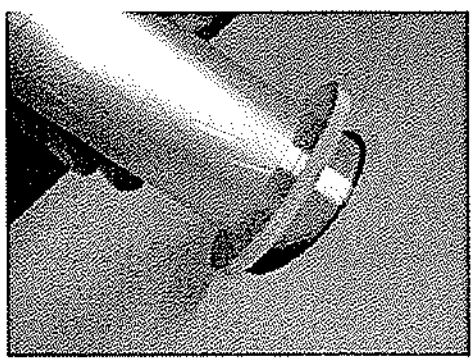
❸ To get a clear picture of the sun and its spots adjust the mirror by screwing the cylinder in its base :





❹ If the picture is not clear remove the lens tube and move ring N°1 by 5 millimeters.
(Turn about 5 times the ring on the tube to get 5 millimeters).
See instructions bellow.





❺ Now you can use Solarscope and observe the sun and all its phenomenon such as eclipses, occultation and transits!

4°) Some hints to use the Solarscope:

① Never observe the sun directly through the lens alone:

For security reasons and for your eyes always use Solarscope fully assembled as indicated above.
No components must be missing.

② Use Solarscope in a wind proof environment:

Indeed wind can move it and modify the observation.
To avoid such a problem we advise to use Solarscope through a window or inside a room.
Weather might damage your Solarscope, so keep it out of the rain!

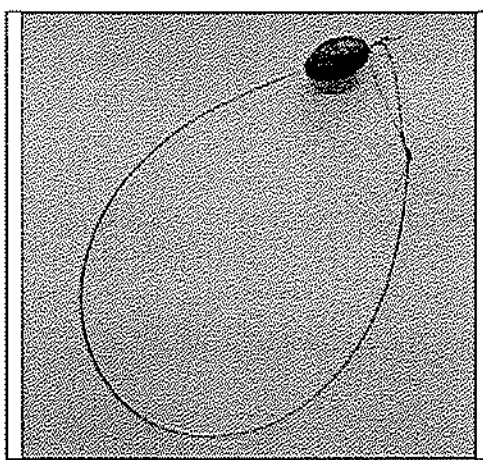
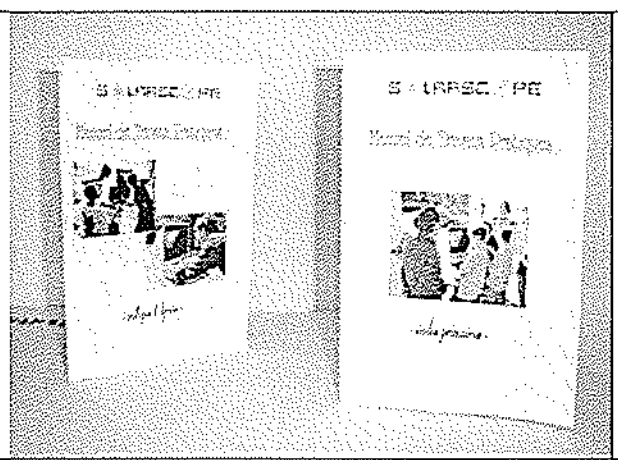
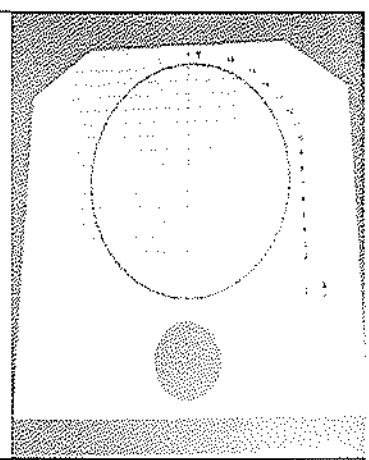
③ Other options:

You can calculate the sun's direction thanks to the protractor on the left side of Solarscope. In order to calculate this use:

- A plumbline for instance ~2 g (e.g. fishing thread and sinker)
- Make a hole at the 90° angle point on the protractor which is on the left side of Solarscope.
- Use a pin to clip the plumbline (e.g.: thread and sinker) on the Solarscope.

This system allows you to directly read the elevation on the protractor.
This is useful if you wish to compare your measures done throughout the season. (see N°5 pour possible application of Solarscope)

5°) Various accessories of educational version:

		
Plumbline system	**Handbook of practical works**	**Measurement screen**

"Plumbline" system:

It is possible to locate the direction sight of the Sun thanks to the plumbline and to the protractor printed on the left side of the Solarscope.

How to fix the plumbline?

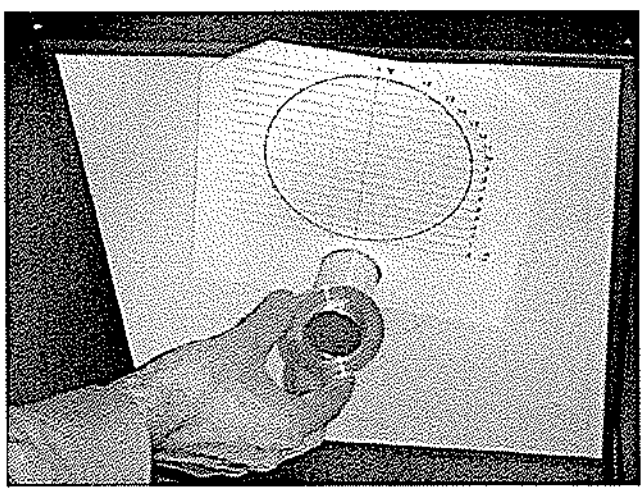
Bore the Solarscope as indicated on the photography.
Use a pin to clip and suspend the plumbline.

This system enables you to read directly in degree the angle of inclination of the Solarscope with the horizon (direction sight)

"Practical works"

The education version also includes a handbook of practical works for primary and secondary school level.

"Measurement screen"



The measurement screen is a tool which makes it possible to measure the displacement of the picture of the Sun and its sunspots with accuracy.
Its utilization is detailed in the handbook of practical works.
The measurement screen is placed on the white zone inside the Solarscope as indicated on the photography and its maintain is ensured by the two rings used to fix the lens tube.

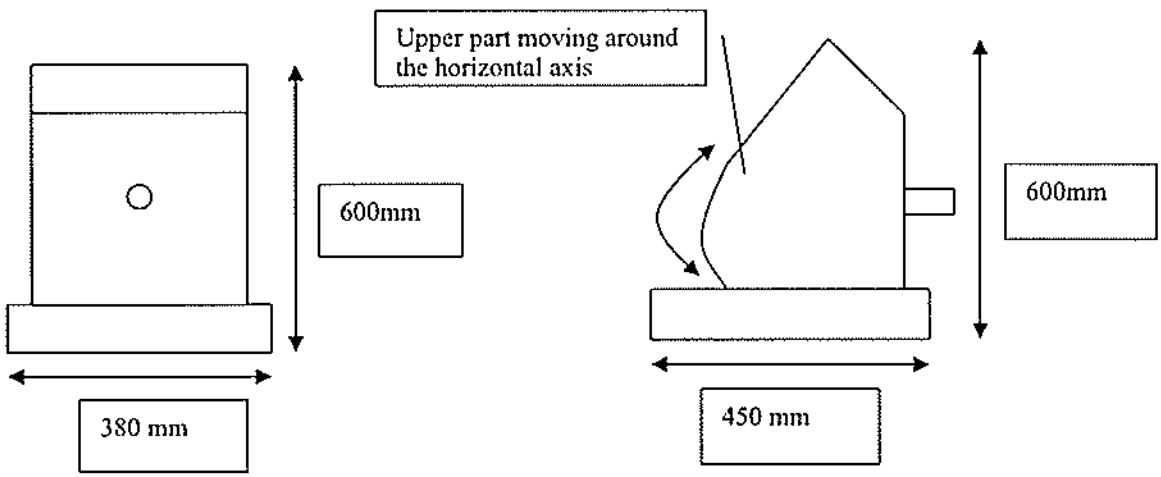
6°) What can be measured with Solarscope?

Solarscope can be used to measure several characteristics of the solar system:

- Earth's rotation rate (Solar day measurement),
- Sun's rotation rate,
- Inclination angle of pole axis,
- Latitude of a place,
- Terrestrial orbit eccentricity,
- Time's equation,
- Astronomical Unity.

To find useful information to make those measures, please contact us at our official web site on Solarscope : www.solarscope.org

7°) Technical characteristics :



Materials :

- Basis and upper rotary part : cardboard
- Lens and mirror : glass
- Mechanical mounts : aluminium

- Dimensions :Size package : 650 X 480 X 65 mm3
- Dimension of instrument fully assembled : 600 X 450 X 380 mm3
- Weight : 1350 g (1500 g packaging included)

Optical Caracteristics :

- Optical specifications : focal length 13 m, image quality : better than 1 lambda (wave front)
- Optical aperture : 38 mm
- Size of Sun's image on the projection screen : diameter 115 mm (about)
- Observation screen size : 340 X 340 mm ²

Safety :
Ocular safety: Solarscope is designed to be eye safe.

Assembling:
Sold with assembly instructions, folded in a table game-sized box. Mirror and lens are delivered already stuck and positioned in mounting. Mechanical mounting will be placed and screwed on to the cardboard.

Patent:
This instrument is protected by patents n° FR 2812951 and n° 02/08984. SOLARSCOPE is a registered trade mark.

Inventor: Jean Gay, astronomer at « l'Observatoire de la Côte d'Azur ».

5 steps to adjust your Solarscope: