TRANSIT OF A VENUS WORKSHOP: HOW TO MAKE A "MUST SEE TV" SCREEN

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Abstract: On June 8, 2004, Venus will transit the Sun—a phenomenon so rare it has not been witnessed by any human now alive. We present an inexpensive device with which a group of people can safely witness a magnified view of the transit of Venus. Observers can also use the rear-projection device to track sunspots without risk of eye injury. See http://www.transitofvenus.org/tvscreen.htm for instructions and supporting images.

In preparing for the transit of Venus on June 8, 2004, workshop participants assembled a rear-screen projection device that slides into a 1.25-inch telescope focuser. The *"Must See TV (Transit of Venus)" Screen*, when properly assembled and used, allows a group of people to view a magnified image of the Sun simultaneously without the risk of eye injury. After a brief transit of Venus tutorial, we also presented alternative methods for viewing the transit of Venus safely.

Below are the list of inexpensive materials, the suppliers we used, and simple instructions to make the device. See http://www.transitofvenus.org/tvscreen.htm for supporting images.

To use the *TV Screen*, simply slide the eyepiece, topped by the funnel and screen, into the telescope focuser and aim the telescope at the sun. *Be sure to follow normal safety protocols when viewing the Sun*, including (but not limited to) stopping down the telescope aperture if necessary, removing the finder scope to prevent accidental exposure, and aligning the telescope by indirect methods so as not to look directly at the Sun. When the Sun is centered on the projection screen, adjust the focus until you get a clear image of the Sun.

You can easily photograph the projected image. If the image is too bright, block the aperture to step down the amount of light entering the telescope. Change eyepieces to increase magnification. Be aware that if you remove the device when it is aimed at the Sun, the sunlight will come blasting out of the focuser.

Rear Screen Projection Material

Item number 41468

Cost = $5.90

We used an 8" x 8" sheet, priced by the square foot, though a 7" x 7" sheet would suffice. The price is about nine cents per square inch.

When cleaning the filter, use a soft cloth and water and gently wipe in one direction.

Da-Lite Screen Company
3100 North Detroit Street
Post Office Box 137
Warsaw, IN 46581-0137
574-267-8101
fax 574-267-7804
See http://www.da-lite.com for a supplier near you.

Optics

1.25" Kellner 25 mm eyepiece

Cost: $11.00

We purchased our eyepieces from a Canadian company that has educational pricing. They have a wide range of products for telescope building.

Sky Instruments
MPO Box 3164
Vancouver, B.C. V6B 3X6
604-270-2831
fax 1-800-648-4188

Funnel and Clamps

Cost: Funnel: $2.50

Clamps: # 36318, 3 9/16 ($ 1.10) and
36310, 13/16 ($0.89)

We used a black oil funnel from Sears along with two band clamps to secure the projection screen and the eyepiece. Cut the funnel on a band saw below the bell of the funnel to allow the eyepiece to fit securely. Then cut slots into the end with the band saw to allow expansion for other eyepieces.

Construction

Stretch the projection screen material over the wide end of the funnel and secure it snugly with the large clamp. Be sure to eliminate wrinkles so that the surface is taut like a drum. The material will stretch easily.

Slide the eyepiece into the narrow end of the funnel, so the viewing end of the eyepiece is within the funnel, and secure the eyepiece with the smaller clamp. The slits in the narrow end of the tube allow for a variety of different diameters of eyepieces. Insert the eyepiece into a telescope and you are ready to project an image of the sun.

Options

If you use a #12 yellow filter, the projected image will appear more natural in color.

For images of a larger, bucket-sized device, see http://www.transitofvenus.org/tvscreen.htm.

The TV Screen is modified from Bruce Hegerberg's original *Sun Gun* at http://www.america.net/~boo/html/sun_gun.html.