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Manual for the 3-D Combi viewer model 2003.



Normal operation

1. Adjusting sharpness.

By turning one ocular separately, in or out of the viewer body, sharpness is adjusted for one eye.

2. Adjusting the lens separation.

By pulling the oculars from left to right, the lens separation will be adjusted.

3. Changing the oculars.

For the slide format 24x28 mm. up to 24x36 mm. use the oculars with the focal distance of 50 mm. For slide formats smaller than 24x28 mm. use the oculars with the focal distance of 45 mm.

Warning:

The screw-thread on the lens tubes are made for fast adjustment of focal distance. Inserting another lens tube in the viewer body has to be done without force and with care. As soon as the tube is blocked in its thread, take it out and try again, otherwise it might damage the thread.

4. Changing the slide frame format from 41x101 mm. to 50x50 mm.

With your thumbs you have to push the black slide holder to the rear. A spring under the slide holder pushes it upwards to be able to take it out of the housing



The next step is to turn the front to the rear and replace it back into the housing. Be sure that the slide holder drops in its slot.



Maintenance

The Combi viewer does not need any real maintenance. In most cases the housing gets dirty and dust inside the viewer is more and more affecting the quality of the image. Now some guidelines are given to keep or get the viewer in good shape again.

1. **Dirty lenses at the outside.**
   Cleaning the lenses at the outside can be achieved with a soft cloth, cotton material is preferred. A light breath on the lenses and polishing the lenses, gently, will remove dust, fingerprints and eyelash dirt. The coating of the lenses is quite strong, cleaning with white spirit won't damage the lenses, although it recommended not to use it, only when nothing else works.
   The lens tubes can be taken out of the body, now the backside can be cleaned. Cleaning the backside with a clean soft brush and blow at it is in most cases sufficient.

2. **Dust between the lenses.**
   When dust appears to be located between the two achromatic lenses another more careful working method should be used; The lens has to be taken apart.
   1. Prepare a clean working area.
   2. Take the lens tube out of the viewer housing
   3. Make a metal plate with thickness 1 mm.,
      A width of 34 mm. and a length of ± 50 mm.
   4. Put the lens tube with the backside opening aiming upwards.
   5. Take the metal plate. This is now a tool to release the Lens combination. In the lens ring are 2 grooves located where the 34 mm. side of the plate will fit. See the right image.
   6. Now turn the plate anti clockwise or the lens tube clockwise until you feel the ring is leaving the thread. Take the ring out of the lens tube.





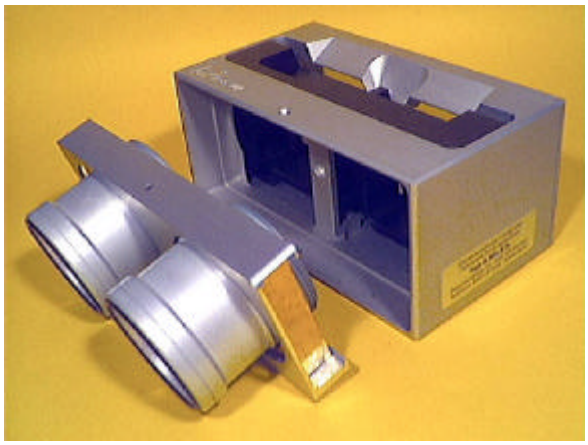
   7. Take a soft cloth and push it inside the back of the lens tube against the lens. Turn the lens tube upside down to let the total lens combination come out of the tube. Look very carefully how the lenses are located with regards to other parts. The achromatic lenses have a front and back part. The front part (eye side) is the most flat side.

8. Remove the dust from the lenses using the cloth and a soft clean brush. Looking through the lenses from some distance and aiming it to the light will show your progress with cleaning. Convince yourself that it is clean enough. It is frustrating to do it all over again after assembling the lens. Repeat the procedure with the other lens. Hint: put the clean lens away on a clean place when doing the other lens. Polishing and brushing the lenses makes them electrostatic, they will attract dust like a magnet!
9. Assemble the two lens elements with the distance ring between it the right way! Insert the whole unit with a cloth in the lens tube. Check again without locking the lenses with the final ring if there became dust between the lenses when mounting them. Finally lock the lens unit by screwing the final ring in the lens tube.

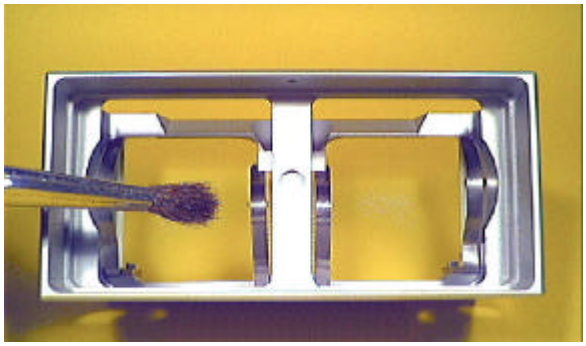
3. Dust on the frosted glass.

The frosted glass at the back of the viewer gets easily covered with a thin layer of dust after a few years. The bar on the bottom of the viewer that holds the 4 slide frame springs locks this glass. You do NOT need to remove this bar!

1. The front part of the viewer, lenses and lens separation mechanism, can be taken out of the housing by taking out the two small bolts in the middle - front of the viewer. See right image.
2. Take out the slide frame carrier.



3. There is now easy access with cleaning tools to the frosted glass, from the front! You can use compressed air or clean brushes to remove the dust from the glass.



4. Do NOT use a soft cloth in this case. The rough surface of the frosted glass acts like sand-paper, the cloth will leave traces of cotton. These traces are afterwards hard to remove with brushes. Then you will need to take the total glass out of the housing.

5. Be careful with some grease remains from the slide frame carrier at the sides of the viewer housing.

Technical specifications	
Frame formats:	41x101 mm. and 50x50 mm.
Maximum slide format:	36x36 mm.
Lens specifications Lens type Aperture: Focal distance: Enlargement:	 Double coated achromatic D= 33 mm. D= 32 mm. f= 50 mm. or f=45 mm. 5x or 5,5 x
Lens separation adjustment:	57-67 mm.
Frosted glass:	Polished with Caborendum powder grain 500.
Viewer housing height:	55 ± 0,05 mm.
Viewer housing width:	120 ± 0,05 mm.
Viewer housing depth (without lenses):	68,5 ± 0,05 mm.
Total weight:	530 gram.