

A "BLINK" COMPARATOR FOR VARIABLE STARS.

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Abstract

A device for displacing telescopic images is described and its use in comparing stellar brightnesses is outlined.

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Recording the changes in magnitude of variable stars involves the comparison of the variable's brightness with that of nearby comparison stars that do not vary. This procedure becomes more difficult when the comparison star is far from the variable or even outside the field of view of the telescope being used.

The accompanying drawings describe an attachment which I have made for use with a small rich-field refractor. With this arrangement one looks down through the telescope into a mirror of at least 1/2 wave accuracy which is instantly adjustable within a small range of motion. It temporarily alters the field of view of the telescope to include any nearby star, even superimposing it on the previous position of the variable.

The mirror is attached to a steel plate which normally rests by gravity on the heads of three screws. A downward movement of the handle on the side raises the mirror against the three upper screws which can be adjusted to change the orientation of the mirror to include any nearby star not in the original field. Releasing the handle again brings back the original orientation and view. This can be repeated until a comparison is made. See Figure 1.

Methods of attachment to the front of the telescope can vary. With mine it is accomplished by clamping the tube with a three-sided box arrangement made of heavy sheet metal. A stiff coil spring provides the clamping power. All this then attaches to the pipe fittings of a small equatorial mount. See Figure 2.

The parts were bent to shape and put together with screws and nuts. The coil spring allows the attachment to be quickly removed if the telescope is to be used in another mount.

I believe that greater accuracy of construction would allow accurate superposition of the comparison star on the variable. In actual practice with my instrument, this is not quite attainable but, even so, both stars are brought so close together that no eye movement is necessary to compare them.

Mayall (1970) states: "When comparison star and variable are widely separated they should be brought successively into the center of the field". This attachment enables this to be done in the shortest possible time and the "blink" effect reduces the influence of the Purkinje phenomenon.

As an example, I will use a variable which I have used to start Jr. High students on observing because the star field is so easily located. This is ST Ursae Majoris (6<sup>m</sup>4 - 7<sup>m</sup>5). The portion of the AAVSO chart reproduced in Figure 3 shows the distances of the comparison stars range from about 0.5 degrees to 3.5 degrees from ST UMa. My usual 1-1/8" F.L. eyepiece gives

a useful field of about  $3^\circ$  and, as the field circle shows, this places three comparison stars outside the field of view and one just on the edge of it. Flipping the mirror in my instrument increases the useful field to  $7.5^\circ$ , thus bringing all comparison stars within its  $3.75$  radius and making possible the centering of all stars in the field.

The adjusting of the screws for each comparison star does increase the time required to make a reading, but the improved accuracy seems to make it worthwhile. This is especially true when trying to compare stars that differ by only  $0^m.1$ .

#### REFERENCE

Mayall, M. W. 1970, Manual for Observing Variable Stars,  
(Revised ed., Cambridge, Massachusetts: A.A.V.S.O.), p.9.

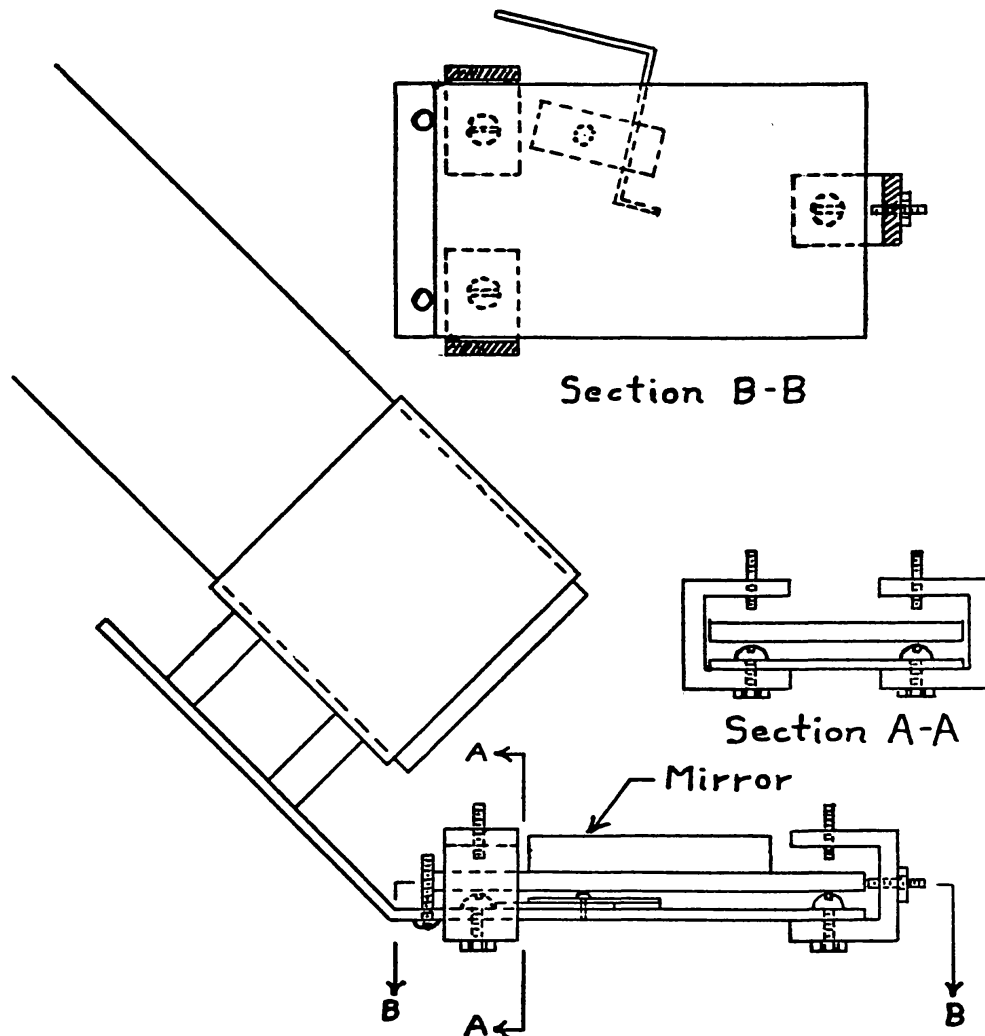
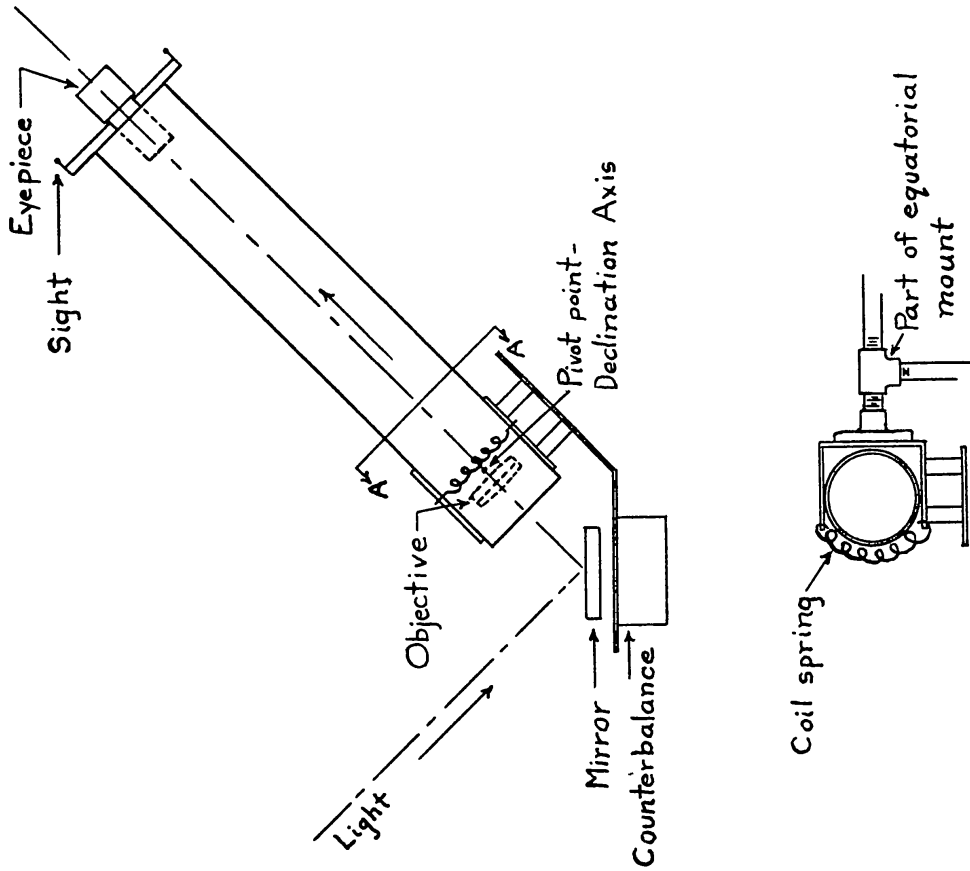
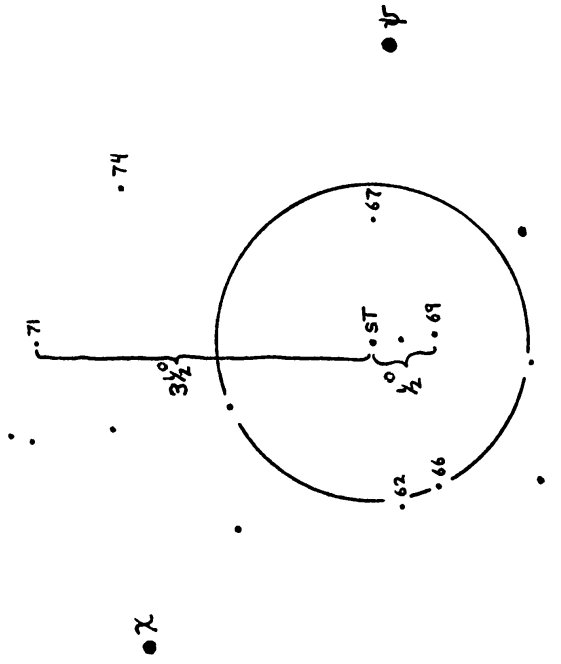


Figure 1. Schematic diagram of the "blink" comparator.



Section A-A

Figure 2. Method of mounting the comparator.



ST Ursae Majoris  
6.4<sup>m</sup> - 7.5<sup>m</sup>

Figure 3. Sample field and its displacement with the comparator.