

SECTION V

INSPECTION AND MAINTENANCE

1. INSPECTION.

Pre-Flight - See that the bubble can be properly formed, that the lights function and controls work properly. Sights should be taken on some distant object using both horizon and index prisms. If, for coincidence of the images, a reading of greater than 2 minutes from the zero graduation is obtained, one of the prisms has shifted in position and should be re-adjusted as described in a later section. It does not indicate which prism has shifted, but, since it is unlikely that both prisms will shift the same amount, it will indicate when an adjustment of the instrument should be made.

2. MAINTENANCE.

a. ADJUSTMENT OF THE SEXTANT.

(1) ADJUSTMENT OF THE TELESCOPE. The objective lens must be in such a position that the image formed from a distinct distant object (800 or more feet distant) or a collimator adjusted to give parallel rays of light on the same plane as that occupied by the bubble in the bubble cells. To do this focus the eyepiece sharply on the bubble. Move the eye up and down a small distance and if there is no parallax, i.e., no relative motion between the image and the bubble, the objective is properly adjusted. The image and the bubble should both appear sharp. If parallax is present, the objective lens assembly must be moved enough to eliminate it. The set screw at the top of the telescope tube and to the rear of the horizon shutter housing holds the objective lens assembly in place. It may be necessary to file the clearance hole for the set screw before replacing it after adjustment.

(2) ADJUSTMENT OF PRISMS.

(a) The prisms may require adjustment because of the following errors:

1. Index Error - The index prism image of the horizon at zero reading does not coincide with the bubble.

2. Horizon Prism Error. - The horizon prism image of the horizon does not coincide with the bubble.

3. Horizontal Non-Coincidence - The horizon and index prism images of some vertical object do not coincide.

(b) For these adjustments an accurately set horizontal collimator or natural horizon should be used. If a collimator is used, it should preferably have a horizontal collimation line. If no collimator is available, a light or line some 800 or more feet distant, exactly at the same height as the Sextant may be used. The light or line should be located by means of a transit or surveyor's level. For convenience, the Sextant should be clamped to some rigid structure during the checking and read-instrument operations. The bubble, about 3/32" in diameter, should be formed and be approximately in the middle of the field. If the natural horizon is used, correction for the "Dip of the Horizon" should be applied.

(3) ADJUSTMENT FOR THE INDEX ERROR.

(a) A sight should be taken on whatever horizon, as mentioned above, is being used and this line should be brought in collimation with the bubble. When this condition is attained, the vernier scale on the micrometer drum should read zero if the instrument is in adjustment. The horizon shutter should be moved to its extreme position in the direction opposite to the arrow during this operation.

(b) If the error is smaller than 10 minutes, the adjustment can probably be made by shifting the lubber line ring carrying the reference mark holder. This ring is clamped in place by a screw on the back side of the ring. Care must be taken that the reference mark holder does not touch the bottom of the micrometer drum. It should be possible to insert a sheet of thin paper between them. Adjustment of the reference mark holder may be made if the screw on each side of the reference mark is loosened.