OPERATION

Initial Operation

⚠ WARNING **Protect the instrument against moisture and direct sun light.**

Do not subject the instrument to extreme temperatures or variations in temperature. As an example, do not leave it in vehicles for long time. In case of large variations in temperature, allow the measuring tool to adjust to the ambient temperature before putting it into operation. In case of extreme temperatures or variations in temperature, the accuracy of the measuring tool can be impaired.

Avoid heavy impact or falling of the instrument. After heavy exterior impact on the instrument, an accuracy check should always be carried out before continuing to work.

Setting Up Instrument

⚠ WARNING **It is important that the tripod is set up firmly. Make sure that the tripod points are well into the ground.** On paved surfaces, be sure the points hold securely.

The legs should have about a 3-1/2 foot spread, positioned so the top of the tripod head appears level.

If using a tripod with adjustable legs, be sure the leg clamps are securely hand tightened.

Before setting up your instrument, be sure clamps are loosened and telescope lock lever **9** (LT6-900) is in the closed position.

Attach the instrument to the tripod securely, hand tightening the instrument base to the 5/8-11 tripod head.

Setting Up Over a Point

⚠ WARNING **Never use force on any parts of the instrument.** All moving parts will turn freely and easily by hand.

Hang the plumb bob, attach cord to the plumb bob hook of the tripod.

Move the tripod and instrument over the approximate point. (Be sure the tripod is set up firmly again. Loosen leveling screws and shift the instrument laterally until the instrument is positioned directly over the point.

If necessary, the instrument can be shifted by loosening the tripod center stud and sliding the instrument from side to side for proper positioning.

Leveling the Instrument

Set the instrument leveling screws. Turn down the leveling screws until firm contact is made with the instrument base.

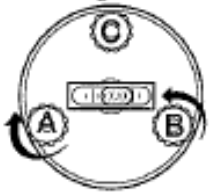
⚠ CAUTION **Do not overtighten the leveling screws.** It is very possible to overtighten the leveling screws. Only a firm contact between the screws and the base is necessary. If the instrument shifts on the base, turn down the screw more firmly by hand.

Leveling the instrument so the vial bubble remains centered through a 360° rotation of the telescope is the most important operation in preparing to use your instrument.

When leveling your instrument, be sure not to touch the tripod. Follow these instructions carefully.

Again, be sure telescope lock lever **9** (LT6-900) is in the closed position.

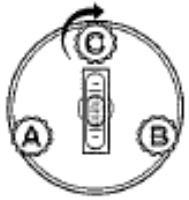
Line up the telescope so that it is directly over a pair of leveling screws.



Grasp these two leveling screws (**A** and **B**) with the thumb and forefinger of each hand.

Turn both screws at the same time by moving your thumbs toward each other or away from each other, until the bubble is centered.

When the bubble is centered, rotate the telescope 90 degrees over the leveling screw (**C**) and turn the screw until the bubble is again centered.



Shift back to the original position and check the level. Make minor adjustments with leveling screws if necessary.

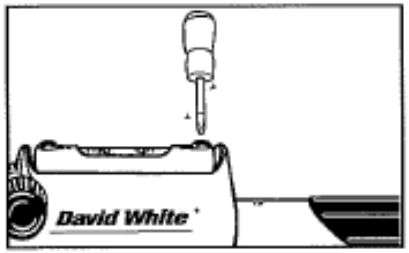
Final Level Check

Rotate the instrument 180° so the vial is reversed. If the bubble will not center when reversed, follow adjustment procedure outlined under "Bubble Adjustments."

Bubble Vial Adjustment

Bubble adjustments must be correct if proper results are to be obtained using the instrument.

If the telescope bubble does not remain centered after having leveled the instrument, and reversed the telescope end for end (180°) the need for adjustment is indicated. Use a screwdriver.



With the bubble level adjustment screw **17** facing to the right of the bubble and with telescope directly in line with two of the three leveling screws, note to which side the bubble is off.

If to the left, loosen screw **A** very slightly to remove ONE-HALF the error. Remove the other half of the error with the two level screws in line with the telescope.

If the bubble is still not exactly centered, repeat the procedure.

If bubble is off to the right, tighten the bubble level adjustment screw **17**. Otherwise, the procedure is identical.

Reading the Circle and Vernier

The 360° horizontal circle **5** is divided in quadrants (0 - 90°). The circle is marked in degrees and numbered every 10 degrees. The horizontal circle **5** is referred to as the circle or degree scale. On the LT6-900 transit level, the vertical arc **10** also is a degree scale, and it is numbered every 10 degrees to 45 degrees, up and down.

For very precise readings, the instruments are equipped with a horizontal vernier **16** which divides each degree on the circle or arc into 12 equal parts of 5 minutes each. There are 60 minutes (60') in a degree.

The vernier scale **16** is read in the same direction (right or left) as you're reading the degree scale.

The following examples will explain how to read the degree and vernier scales on the circle and arc.

Exact Degree Reading

The point at which 0 on the vernier scale touches the circle. If the 0 coincides exactly with a degree line on the circle, your reading will be in exact degrees.

There are no fractions of degrees, or minutes, to be added to the reading. The horizontal circle reading is 75°.

Fraction (Minutes) Reading

If the 0 on the vernier does not coincide exactly with a degree line, your degree reading is the line which the 0 has just passed, reading up the degree scale, plus a fraction of the next degree.

To determine the fraction, or minutes:

- Start at 0 on the vernier and read up the vernier scale (in the same direction as you're reading the degree scale) until you find a minute line that coincides exactly with a degree line.

- 75° was the last degree line passed on the circle.

  Reading to the right on the vernier scale, the minute line which coincides exactly with a degree line is 45' (Reading is 75° 45').

Remember, each line on the vernier scale represents 5', so you will be reading 5', 10', etc. The circle degree scale is being read to the left.

When reading the circle degree scale to the left, read up the vernier scale in the same direction.

Sighting and Focusing the Telescope

Avoid touching the tripod while sighting.

- Aim the telescope **1** at the object and sight first through the notch on the top of the telescope for preliminary sighting. Look through the telescope eyepiece **2** and bring the object into focus using the focusing knob **3.**
- Rotate the instrument until the crosshairs are positioned on or near the target. Tighten the horizontal clamp **7** and make final settings with the tangent fine tuning knob **8** to bring the crosshairs exactly on point.

When sighting through the telescope, keep both eyes open. You will find that this eliminates squinting, will not tire your eyes and gives the best view through the telescope.

Remember to avoid touching the tripod while sighting.

Removing the instrument from the tripod

Loosen two adjacent leveling screws and unscrew the tripod mounting stud while holding onto the instrument.

Remove the instrument from the tripod and secure it in its protective carrying case. Loosen the vertical clamp and close the lock lever on the level-transit.

Center the telescope in the case.