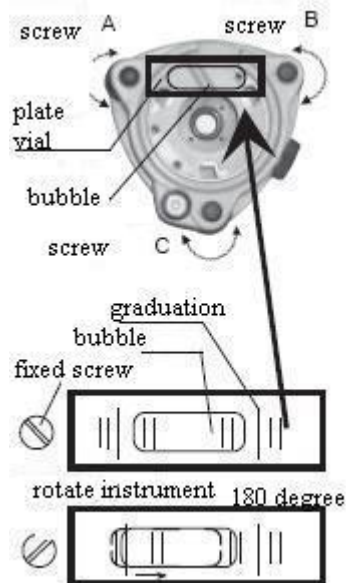


**SERVICE MANUAL**  
**(DTM100 SERIES)**

## 1. Check & Adjustment of Plate Vial

### Check

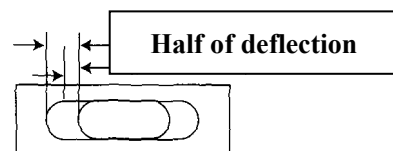
① Rotate the instrument horizontally by loosening the Horizontal Clamp Screw and place the plate vial parallel with the line connecting leveling screw A and B, and then bring the bubble to the center of the plate vial by turning the leveling screws A and B. (shown as below )



② Rotate the instrument  $180^\circ$  (200g) around its vertical axis. Observe the bubble of plate vial. Follow the steps below to adjust it if the bubble is not in the center.

### Adjustment

① If the bubble of the plate vial moves from the center, bring it half way back to the center by adjusting the leveling screw, which is parallel to the plate vial. Correct the remaining half by adjusting the screw of plate vial with adjusting pin.



② Confirm whether the bubble does is in the center by rotating the instrument  $180^\circ$ . If not, repeat step ①.

③ Turn the instrument  $180^\circ$  (200g) and adjust the third screw to center the bubble in the vial.

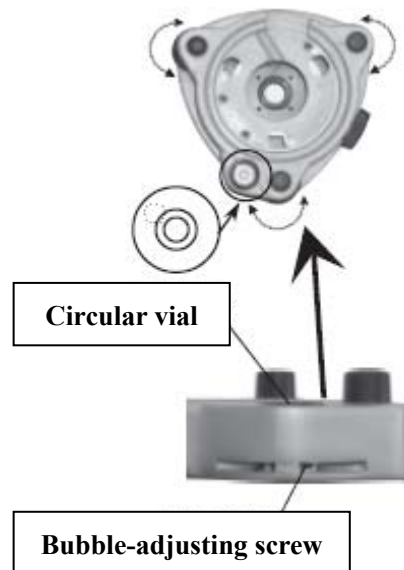
## 2. Check & Adjustment of Circular Vial

### Check

No adjustment is necessary if the bubble of the circular vial is in the center after inspection and adjustment of the plate vial. (shown at right)

### Adjustment

If the bubble of the circular vial is not in the center, bring the bubble to the center by using the adjusting pin to adjust two bubble-adjusting screws.



## 3. Check & Adjustment of Optical Plummet

### Check

① Set the instrument on the tripod and place a piece of white paper with two perpendicular lines, then intersect drawn on it directly under the instrument. Adjust the leveling screws so that the center mark of the optical plummet coincides with the intersection point of the cross on the paper.

② Rotate the instrument around the vertical axis 180° (200g) observe whether the center mark position coincides with the intersection point of the cross. If the center mark always coincides with intersection point, no adjustment is necessary. Otherwise, the following adjustment is necessary.



### Adjustment

① Take off protective cover of the optical plummet, you may see 4 adjusting screws. Adjust 4 adjusting screw.

② Move woodscrew to make the center of optical plummet coincides with ground point.

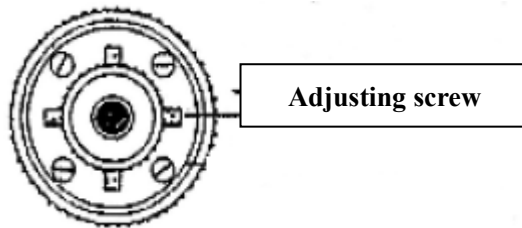
③ Rotate the instrument around the vertical axis 180° (200g) observe whether the center mark position coincides with the intersection point of the cross. If the center mark always coincides with intersection point, no adjustment is necessary. Otherwise, repeat steps above mentioned.

## 4. Check & Adjustment of Perpendicularity of line of sight to Horizontal

### Axis (2c)

#### Check

- ① Set target A which should be the same height as the instrument, level the machine and then turn on.
- ② Aim at target A when turn left and read the Horizontal angle(L)(for example:  $L=10^{\circ}13'10''$ ).
- ③ Loose the Vertical and Horizontal Clamp Screw ,move the telescope. Then aim at target A(remember to lock the Vertical and Horizontal Clamp Screw before aiming ) and get the Horizontal angle(R)(for example:  $R=190^{\circ}13'40''$ ).
- ④  $2C=L - (R \pm 180^{\circ}) = -30'' \geq \pm 20''$ , it should be adjusted.



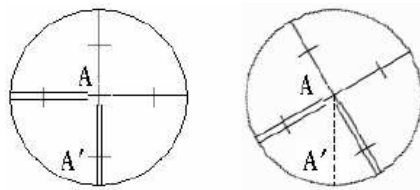
#### Adjustment

- ① Move the Horizontal Tangent Screw to make the reading as R-C ( $R-C=190^{\circ}13'40'' - 15''=190^{\circ}13'25''$ ).
- ② Take away the cover between the telescope eyepiece and focusing knob, adjust the two adjusting screws(left and right) to make reticle coincides with cross line of collimator or one target away.
- ③ Repeat check and adjustment until  $|2C| < 20''$ .
- ④ Put the cover back .

## 5. Check & Adjustment of Inclination of Reticle

### Check

- ① Set the instrument on a tripod and level it.
- ② Aim at target A with telescope (One point, 50m away) .
- ③ Observe point A moves along the vertical line of the reticle or not by moving telescope up and down.. If so, no adjustment is necessary. If not so, then need to adjust the reticle.



### Adjustment

- ① Remove the eyepiece cover to expose the four reticle adjusting screws.
- ② Loosen the four reticle adjusting screws uniformly with an adjusting pin. Rotate the reticle around the sight line and align the vertical line of the reticle with point A. Tighten the reticle adjusting screws.
- ③ Repeat the inspection and adjustment to see if the adjustment is correct.



**Notice: Please check the perpendicularity of line of sight to Horizontal Axis (c) and the index after the adjustment.**

## 6. Check & Adjustment of Vertical Index Difference ( i angle)

(Inspect the item after finishing the inspection and adjustment of section 4 and 5.)

### Check

- ① Set the instrument on a tripod and level it.
- ② Sight object A in left position and read the Vertical angle value VI. Rotate the telescope. Sight object B in right position and read the Vertical angle value VR.
- ③ Calculating,  $i = (VI + VR - 360^\circ) / 2$
- ④ If  $i \leq 10''$ , no adjustment is necessary. If  $i > 10''$ , adjust it.

### Adjustment

(Please adjust through the software if the differences between the index is too big.)

| Operation Procedure  | Operation             | Display   |
|--|-----------------------|---|
| ① Keep to press [F1] to power on until right screen occurs. Loose [F1]                     | [F1]<br>+<br>[POWER]  | ADJUSTMENT MODE<br>V ANGLE 0 SET<br>TURN TELESCOPE                          |
| ② Rotate telescope and make vertical angle passing 0. Enter into the mode of V ANGLE 0 SET |                       | V 0 POINT SET<br>(SETP-1)<br>V: 82° 06' 30"<br>----    ----    ----    SET  |
| ③ Aim at target (left position). Press [F4] (SET)  | Aim at target<br>[F4] | V 0 POINT SET<br>(SETP-1)<br>V: 182° 06' 30"<br>----    ----    ----    SET |
| ④ Aim at target (right position). Press [F4] (SET) . Power on automatically.               | Aim at target<br>[F4] |   |
| ⑤ Finish adjustment Repeat, if not within standard.  |                       |   |

## 7.Adjustment of Simulator signal

### Check

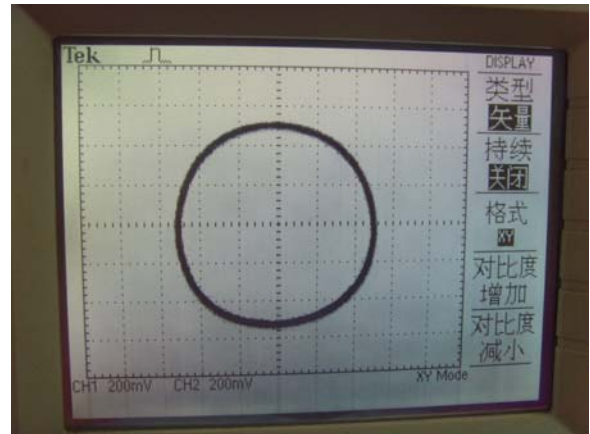
①Set the oscilloscope(shown at right)

CH1 : 200mV

CH2 : 200mV

Center point ( X: -1.65V, Y: -1.65V )

②Connect the two probes of the oscilloscope to HJCOS and HJSIN ( HYCOS to HYSIN, VJCOS to VJSIN).Its ground wire connects with the total station's.



③Turn on,rotate the instrument.Compare the simulator signal with the shown picture :

(a)Unified center

(b)Amplitude:1V ( Max change:0.2V )

(c)There won't be any heavy break during the rotating.

### Adjustment

①Potentiometer distribution(look at the following picture)

Left I : Move the signal right-left      Right I : Move the signal up-down

Left II : Adjust the shape of the signal      Right II : Adjust the size of the signal

②Adjust the potentiometer according with the real shape to make the signal meet requirement.



## 8. Adjustment of Simulator signal at null position

① Set the oscilloscope (shown at right)

CH1 : 200mV ( message source )

Frequency: 10ms

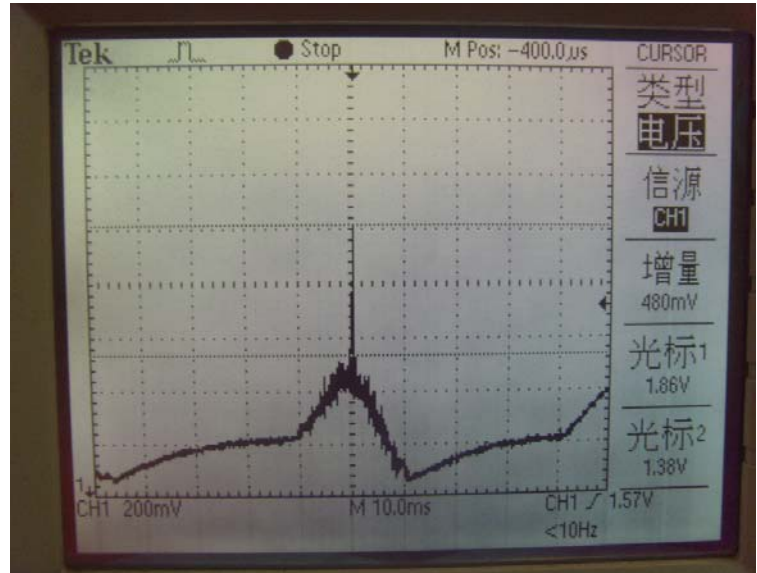
② Connect the probe CH1 to 2ZERO

(look at the picture below)

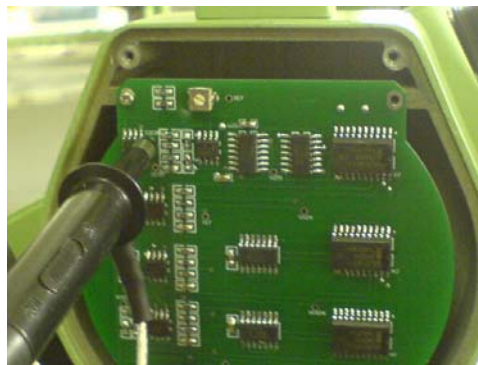
Its ground wire connects with the total station's.

③ Turn on, rotate the instrument. Compare the Simulator signal with the shown picture (Pay attention to the position of the cursor):

Increment > 300 mV;



④ Measure the voltage to earth(A) at REF, adjust the potentiometer to make  $A = (\text{cursor 1} + \text{cursor 2}) / 2$



## 9.Adjustment of the Receiving board

①Take away the shield cover on the EDM.



②Loosen the screw by the straight screwdriver,pull out the fiber (carefully,not to make the fiber break),then take away the shield wire by electric soldering iron.

③Screw off the fixed screws on the receiving board(four pieces),take out the plug which under the board.

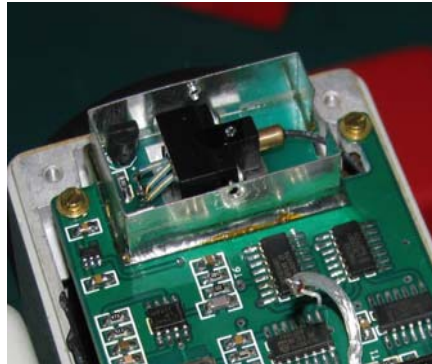


④Get down the board gently,thus the receiving board take-down complete.

⑤Install the receiving board is the other way round.

## 10.Adjustment of the microcomputer board on EDM

- ①Take away the shield cover on the EDM.
- ②Use the electric soldering iron and plier to take away three pins and shielded wire on the luminescent tube.



- ③Screw off the fixed screws on the receiving board(four pieces),take out the plug which under the board(three pieces).
- ④Take up the board gently ,not to make the fiber break, screw off the two fixed screws on the coupling seat of the luminescent tube.
- ⑤Withdraw the receiving board and put the coupling seat of the luminescent tube on the mainbody(you'd better fix it with adhesive tape),thus the take-down process complete.



- ⑥The installation is the other way round.