

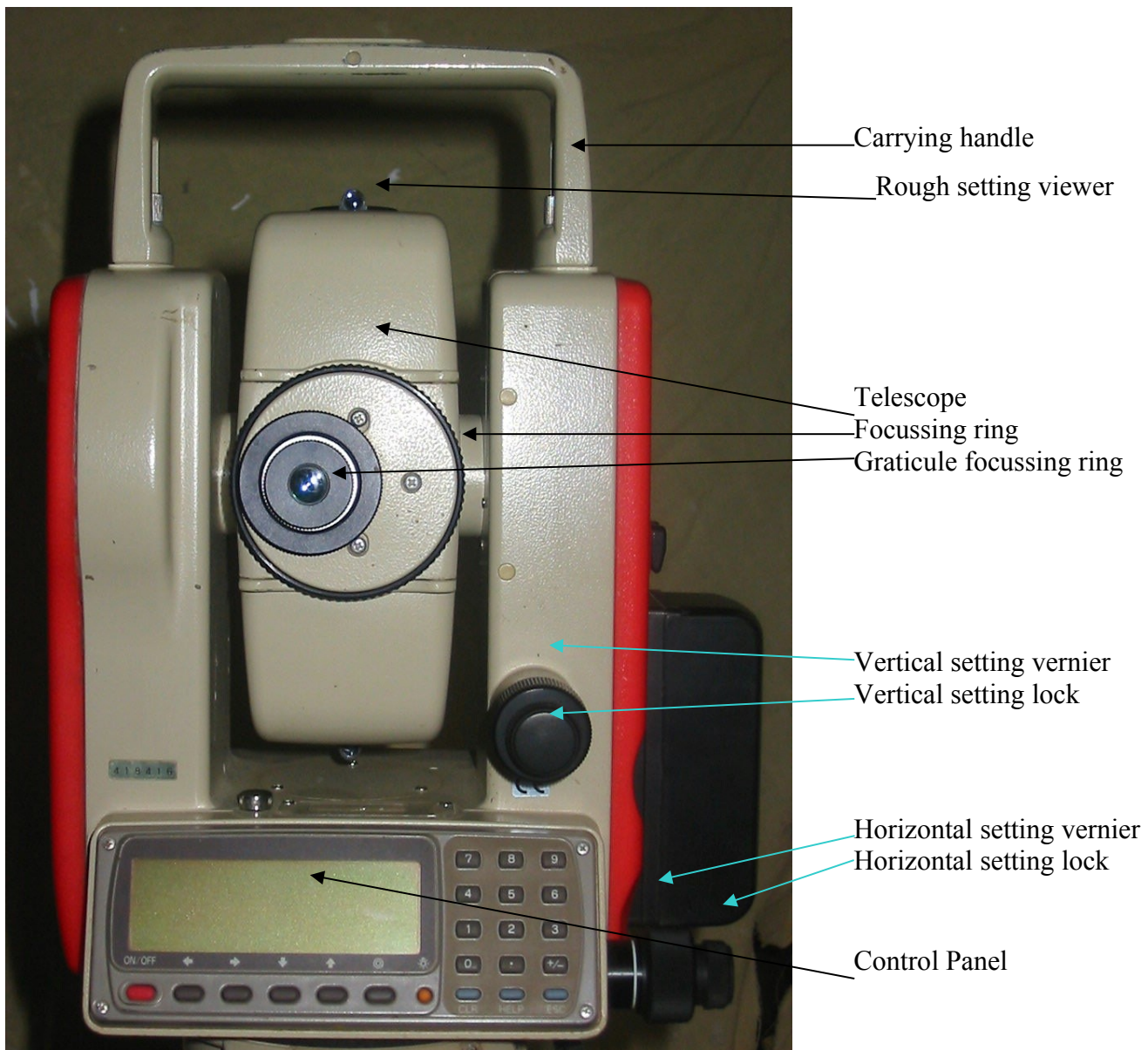
# Wolverhampton Archaeology Group

## Use of the EDM (Electronic Distance Measuring)

The EDM is not as complex as it appears. You can use it at several different levels some of which you may already be familiar with.

- **Dumpy level.** You can use the EDM just to record heights.
- **Theodolite.** The EDM will also record vertical and horizontal angles as well as heights. Useful for surveying but distance measurements by tachymetry are not too accurate.
- **EDM.** Does everything a theodolite does but measures distance accurately using a laser beam reflected from a mirror (modern ones don't even need a reflector). This gives you great precision when surveying. Many EDMs will do the trigonometry for you and convert angles and distances.

### The EDM



## Setting up

- **Charge** up both sets of batteries, you can do both in one evening and overnight. One fully charged battery will last a day.
- **Place the tripod** at the desired spot, raise the platform to a sensible height. Holding the EDM by its handle, release the horizontal setting lock and screw the tribrach onto the tripod.
- **Level the EDM.** Adjust the tripod legs so the bubble in the circular level (on the tribrach) is in the centre. Now turn the EDM so that the long spirit level is in line with 2 of the tribrach adjusting screws. Level the EDM using these 2 screws. Now turn the EDM through 90 degrees and level using the third screw. Repeat until the EDM is level all round. This is the same levelling procedure that you used for the theodolite, but the EDM is **much** more sensitive and knows when it is out of true so the levelling must be done carefully.
- **Battery.** Align the battery contacts with those on the EDM. Put the bottom edge into the battery slot and push the top in. The battery will click into place. Removal is the opposite but you push the black catch down to release the battery. Switch on using the red on/off button on the control panel.
- **The display** will read Turn Telescope  $\uparrow\downarrow$ . Gently move the telescope up and down through the horizontal until the display reads horizontal and vertical angles.



You now need to align the EDM to north. If you have a site north, look through the telescope and set it up on this. Lock the horizontal clamp and press the 0 set button twice. You should see the H.ANG reading change to zero. If you want to use geographic north, use the site north as before, but you must use a prismatic compass to take its bearing and then you can correct all your readings using this. You will also need to correct for the difference between magnetic and geographic north (magnetic is about 4.5 degrees west of true north in 2006, decreasing by about 0.5 degrees in 4 years).

### Measuring.

- First, mount the prism on the extendible rod. Extend this to a suitable length i.e. so the prism is level with the EDM telescope. Lock the locking rings and do not change the length at all if you are taking height readings.
- Get a friend to hold the prism at the measuring point, use the 3 spirit levels on the rod to make sure it is upright, rotate the rod so the prism is pointing at the EDM. You may need to angle the prism up or down as well.
- Sight the prism through the telescope. A suggested way is to release the horizontal lock and with both hands (one still on the lock) rotate the EDM until the rod is in line with the rough setting viewer. Clamp the horizontal lock and make final adjustments through the telescope with the horizontal vernier. Do the same with the vertical controls. Focus the EDM on the prism. You should see the hexagonal pattern made by the prisms. If you see a red circle, you have focussed on the EDMs reflection! Get your friend to rotate the prism until it is pointing at you.
- Take a reading. Press the MEAS button. The EDM will bleep and arrows will appear on the screen. When the reading is finished, the distance will appear on the third line. If the screen shows a triangle with a line under it (as seen in the picture of the control panel), that is the horizontal distance. If you press the button under the triangle (next to MEAS) the line will move around and the display will read the vertical distance and then the hypotenuse before going back to the horizontal distance.
- Record the horizontal angle (H.ANG), the horizontal distance and (if you are measuring heights) the vertical distance.
- **What to measure.** If you need to convert your readings to Ordnance Survey coordinates, you also need to survey a point whose coordinates are known. If you are measuring heights, you will also need a backsight.

### Calculating

- There is a spreadsheet where you can enter your readings and all the calculations will be done for you. All you have to do is plot the results on graph paper or create a graph from within ExCel.