

NATIONAL MAPPING PROCEDURES

VERTICAL ANGLES USING THE WILD T3 THEODOLITE

Time of Observations

Vertical angles truly simultaneous by Radio or Helio flash, are usually read between 1400 and 1600 hours L.M.T. when the air is most evenly heated. If read at other times - and this is not recommended - great care should be exercised, as conditions are altering more rapidly, and therefore the time factor becomes much more critical.

Technique of Observation

As for horizontal angles a system of double pointings is again employed. A series of left and right faces are observed, the difference between one left and one right face being one result. Three such results are normally considered to constitute one set (see Annexure A). Two sets of vertical angles - preferably with half an hour between the sets - is normally considered to be a minimum requirement. If bad conditions are encountered it may be advisable to observe sets on different days.

Point by Point Description of Actual Observing Technique

We assume that the instrument has been set up, and levelled ready to observe, then :

- 1 With the instrument on Face Left intersect the target with the cross wire, remembering to make the final movement of the vertical setting screw in a clockwise direction. In the case of a beacon the cross wire should be laid on the top of the vanes.
- 2 Bring the Alidade bubble into coincidence, again remembering to make the final movement clockwise.
- 3 Bring the scale into coincidence and read off angle. Here again the final movement must be clockwise.
- 4 Take fresh pointing and fresh micrometer reading, remembering to check Alidade bubble.
- 5 Change to Face Right and repeat operations (1) to (4). This completes one result.
- 6 Keep on Face Right and again repeat operations (1) to (4). It is advisable to move the Alidade bubble off and bring it back into coincidence again at this stage, remembering that it is least sensitive when central.
- 7 Change to Face Left and repeat operations (1) to (4). This completes two results.
- 8 Keep on Face Left and repeat operations (1) to (4) again remembering to throw Alidade bubble off and bring it on again.
- 9 Change to Face Right and repeat operations (1) to (4). This completes three results and under normal circumstances should be sufficient.

Targets

It is preferable to observe to the top of the vanes on a standard type beacon, however, this may be difficult or impossible at 1400 hours on a sunny day.

Helios are quite satisfactory targets in this case, provided the aperture is reduced for short lines. Care should always be taken to ensure that relative heights of instrument and targets are recorded immediately after observation (see Annexure A).

ANNEXURE A
TWO OBSERVED SETS

AT STATION NM/F/185		
DAY AND DATE TUES 28 AUG 62 TIME 14.48 W.A.T.		
RELIABILITY OF OBSERVATION SIMULTANEOUS RECIPROCAL		
STATION OBSERVED NM/F/184		
TARGET OBSERVED HELIO		
HT. INST. ABOVE ECCE.		
HT. INST. ABOVE STATION MARK 5' 01		
HT. TARGET SHOWN ABOVE 0.76 Below Inst.		
HT. TARGET SHOWN ABOVE STATION MARK 4' 25		
L	89 54 $\frac{26.1}{26.7}$	89 54 52.8 - 00° 09' 31.3
R	90 04 $\frac{12.0}{12.1}$	90 04 24.1
L	89 54 $\frac{27.4}{25.7}$	89 54 53.1 - 00° 09' 32.8
R	90 04 $\frac{15.9}{12.0}$	90 04 25.9
L	89 54 $\frac{25.9}{25.0}$	89 54 50.9 - 00° 09' 31.5
R	90 04 $\frac{11.0}{11.4}$	90 04 22.4
		MEAN - 00° 09' 31.87

AT STATION NM/F/185		
DAY AND DATE FRI 31 AUG '62 TIME 14.45 W.A.T.		
RELIABILITY OF OBSERVATION SIMULTANEOUS RECIPROCAL		
STATION OBSERVED NM/F/186		
TARGET OBSERVED HELIO		
HT. INST. ABOVE ECCE.		
HT. INST. ABOVE STATION MARK 5' 05		
HT. TARGET SHOWN ABOVE 0.94 Below Inst.		
HT. TARGET SHOWN ABOVE STATION MARK 4' 11		
L	89 56 $\frac{45.5}{45.5}$	89 57 31.0 - 00° 05' 05.0
R	90 02 $\frac{18.0}{18.0}$	90 02 36.0
L	89 56 $\frac{47.1}{45.0}$	89 57 32.1 - 00° 05' 06.4
R	90 02 $\frac{18.3}{19.2}$	90 02 38.5
L	89 56 $\frac{46.4}{45.6}$	89 57 32.0 - 00° 05' 05.2
R	90 02 $\frac{18.0}{19.2}$	90 02 37.2
		MEAN - 00° 05' 05.53