SPATIAL OFFSET MEASUREMENTS
ANTENNA TO CAMERA

[Feb. 10, 2003]

For GPS control of aerial photography it is necessary to determine the spatial distances, measured in the direction of the camera axes, between the phase center of the GPS antenna and the entrance nodal point of the camera lens. The following describes a method used by Topo Photo Inc. for camera/GPS installations when the total horizontal spatial offset is less than one meter.

Field Procedure:

- While in a normal photo-flight attitude, measure the pitch attitude of the aircraft by reference to a suitable fixed surface within the aircraft.
- On the ground, move the aircraft to a level location, free from possible multi-path for the GPS signal, and align the aircraft to point due East. Stabilize the aircraft for zero roll and level flight pitch.
- Orient the camera so that the swing angle is zero and optical axis is vertical.
- With an optical plummet [or its equal], establish a mark on the tarmac directly below the camera nodal point for subsequent occupation by the survey GPS antenna/tripod equipment.
- Measure the vertical distance between the mark and a tangible point on the camera that is dimensionally related to the entrance node.
- Collect GPS observations with the airborne GPS receiver adequate to provide sub-centimeter accuracy with respect to an adjacent mark.
- While still occupying the adjacent mark, move the aircraft and occupy the mark on the tarmac and collect data including the HI.
- Fieldwork is complete.

Equipment:

- GPS receivers [2 ea.] with tripods, antennas and support equipment
- Optical plummet and leveling head [CD-ROM for point marking below leveling head] with spare batteries
- Digital level
- Measuring tape
- Jacks and chains [for a/c stabilization]
- Tape, Sharpie [fine]
- Field book
- Digital camera