

AERIAL PHOTOGRAPHS OF FOREST TREES DETAILS

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The aerial photographs showing details of forest trees, e.g. young shoots, leaves, flowers, fruit, twigs and parts of the trunk, partly displayed the forest soil and the plants in the undergrowth layer. Made during the resting period of the vegetation, the photographs showed sprouts, buds, twigs, trunks and the soil.

Aerial photographs of details are made with the help of the device consisting of two parts, a launching ramp and a capsule. The ramp serves for launching the capsule vertically up into the air, the highest altitude being 50 m above the ground. The capsule consists of an aerodynamic cupola and a camera, which, upon launching automatically takes photographs of the objects upon the ground. The power of the steel spring is used for launching. It is built in the launching ramp. The device is designed for field work, therefore it is easily transportable, made of light materials, and is of small dimensions. The launching ramp is 180 cm high, 37 cm wide and weighs only 7 kg. The capsule with the camera is 5 cm in diameter, 13 cm long, weighs only 15 dkg. A Leica 35 mm film is used, black and white, color or infrared.

Detailed aerial photographs is done without flying objects, just by launching the camera from the ground, each photograph separately.

The main characteristics of this method are that the photographs are obtained relatively fast, easily and under favorable conditions. The photographs are compatible with those obtained by other methods. The compatibility is particularly important when special forestry maps are made, since the aerial photographs of details offers additional information when using aerial and satellite photographs of high resolution.

Detailed aerial photographs of forest trees is designed for scientific research in forestry. It could be applied in other scientific fields. The best application is on permanent experimental plots, where it is possible to take photography from the same spot all the year round, which is suitable for observation of the development of leaves, flowers and fruit, together with the physiological activity of forest trees, the occurrence of forest pests, etc. The activities going on in the upper spheres of the crown should be seen and observed, as it is there where new development processes start, and where forest stands begin to deteriorate.

1 DEVICE FOR AERIAL PHOTOGRAPHY

The device consists of a launching pad and capsule with built-in camera. (Fig. 1) The launching pad consists of a square bearing pillar (1) which combines a spring, slide rods of circular cross-section (2), a rhombic-shaped slide (3) which is connected at the top to the spring in the pillar by a cord (4), over the wheel on the pillar top (5), and at the bottom is connected to the spring tensioner (6). On one side of the slide there is a tube which slides along the slide rod, and on the other side there is a cylindrical shell for fixing the capsule before launching. At the bottom of the pillar there is a cogwheel (7) with locking gear and opening for tensioning of the spring. On the side of the pillar, opposite the slide rod, there is a plumb-line (8) for adjusting the launching pad in the vertical position, and indicating the tensioning degree of the spring, i.e. the launching height. The other parts of the launching pad are a base (9), hook for anchoring the device (10) and a slide stopper.

The capsule consists of a parabolically shaped dome (12), under which there is a cylindrical compartment (13) with a built-in camera and three fletchings at the bottom (14) for directing the flight of the capsule.

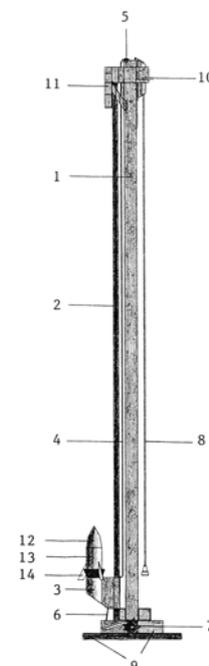


Fig. 1: Lateral view of the device

2 PHOTOGRAPHS SHOWING THE DEVICE



Photo 1 Launching pad fixed to the ground by means of three stakes and three strings



Photo 2 Detail of the bottom of the launching pad with the mounted capsule



Photo 3 Capsule on its way back to the ground following the launching and taking of photographs



Photo 4 For safety reasons the capsule is caught in a net

3 AERIAL PHOTOGRAPHS



Photo 5 Detail of the central part of the Botanical Gardens in Zagreb, photographed 30 m above ground



Photo 6 Forest trees, various species



Photo 7 Parts of the trees of three different species photographed 15 m above the ground



Photo 8 Detail of the northern part of the Botanical Gardens in which, apart from the trees, street traffic is also visible



Photo 10 Detail of part of a Beech tree crown (*Fagus sylvatica* L.) at a height of 27 m.

Photo 11 Photograph of a dried branch at a height of 23 m.

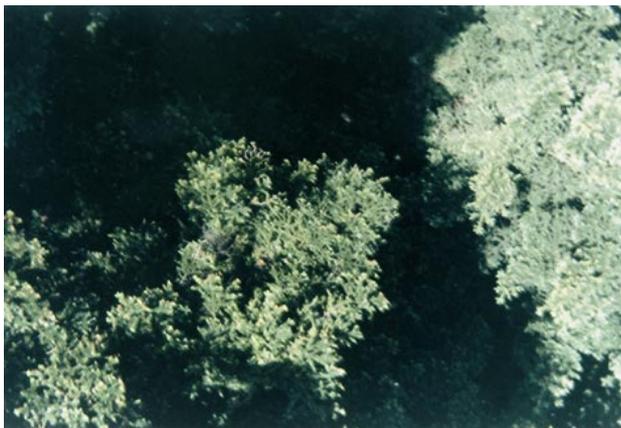


Photo 9 Tops of Fir trees (*Abies alba* Mill.) on the "Zagrebacka gora", photographed from a height of 35 m.