A Test Object for Architectural Photogrammmetry: Otto Wagner's Underground Station Karlsplatz in Vienna

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A small test object has been selected, photographed, measured and documented, in order to have well-checked materials to train students and photogrammetrists as well as to evaluate internationally the results of the analytic photogrammetric process with various cameras, with different software and with different kinds and amount of control information. The test object is one of Otto Wagner's Stadtbahn Station buildings on the Karlsplatz in Vienna, a masterpiece of Art Nouveau, built in 1898/1899.

The above picture shows the building on an Austrian stamp issued in 1991 on the occasion of the 150th birthday of Otto Wagner. (* 13.7.1841, + 11.4.1918). Photography has been taken with metric and non-metric cameras, with medium and small format:

Camera	f [mm]	Format [mm]	Remarks
Rollei 6006	f=80	60x60	metric, reseau
Hasselblad 500 EL/M	f=51	60x60	non-metric
Leica R5	f=35	24x36	metric, reseau
Nikon FE2	f=28	24x36	non-metric

The film used is Kodak Ektachrome EPN 100 ASA. Alltogether, there are 52 colour diaposives available, well distributed all around the Otto Wagner pavilion (see Figure 1), 12, 13 or 14 per camera.

"Ground" control points, better to say object control points, have been measured and computed precisely. The original polar measurements are available on floppy disk as well as the computed, adjusted coordinates which have an accuracy of about 2 mm, and that is good enough for any test in connection with architectural photogrammetry.

Well done sketches show the natural control points, the end points of control distances and the position of control point targets (see Figure 2).

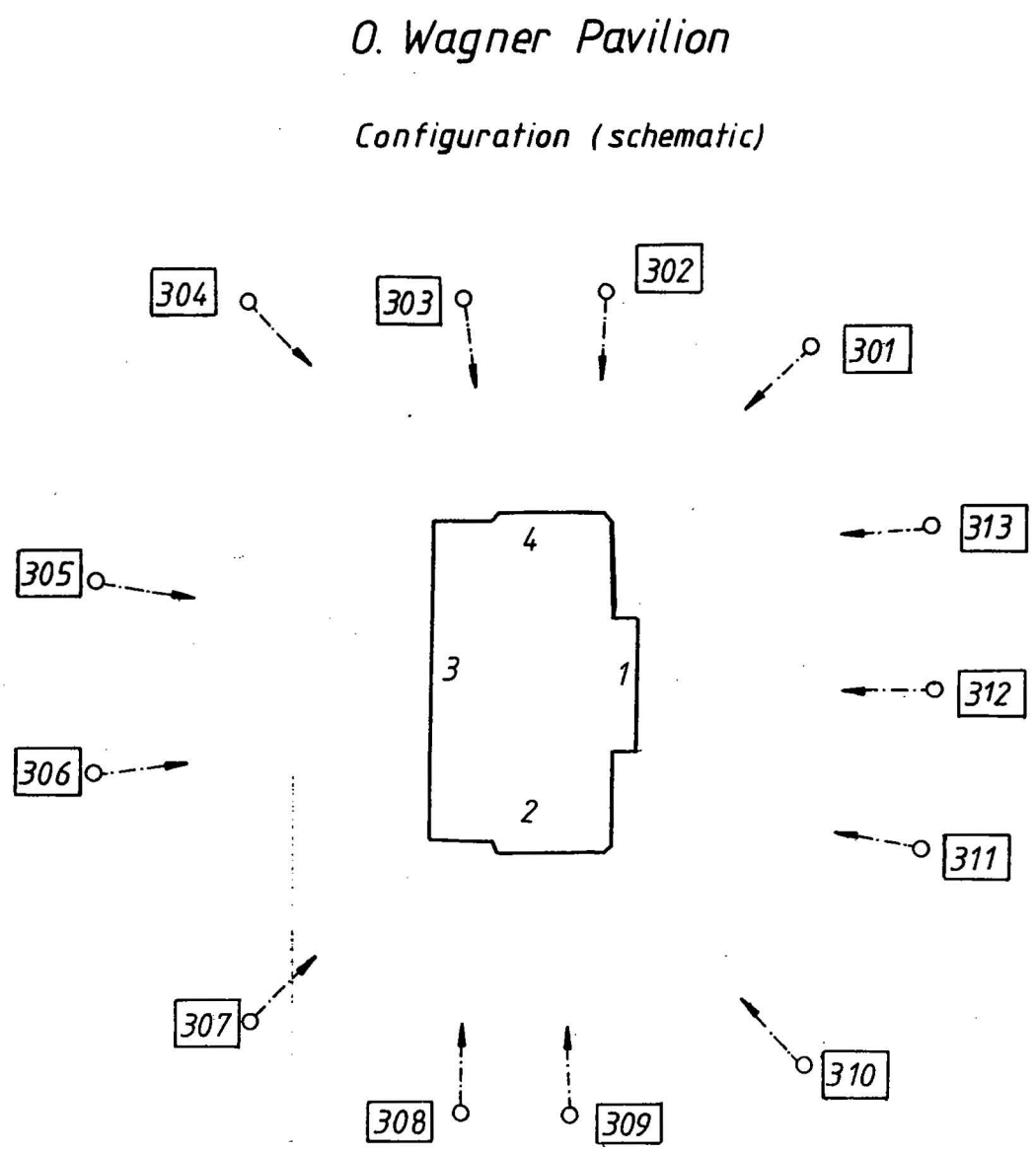

Fig.1 The arrangement of photography.
(Example for one of the four cameras)

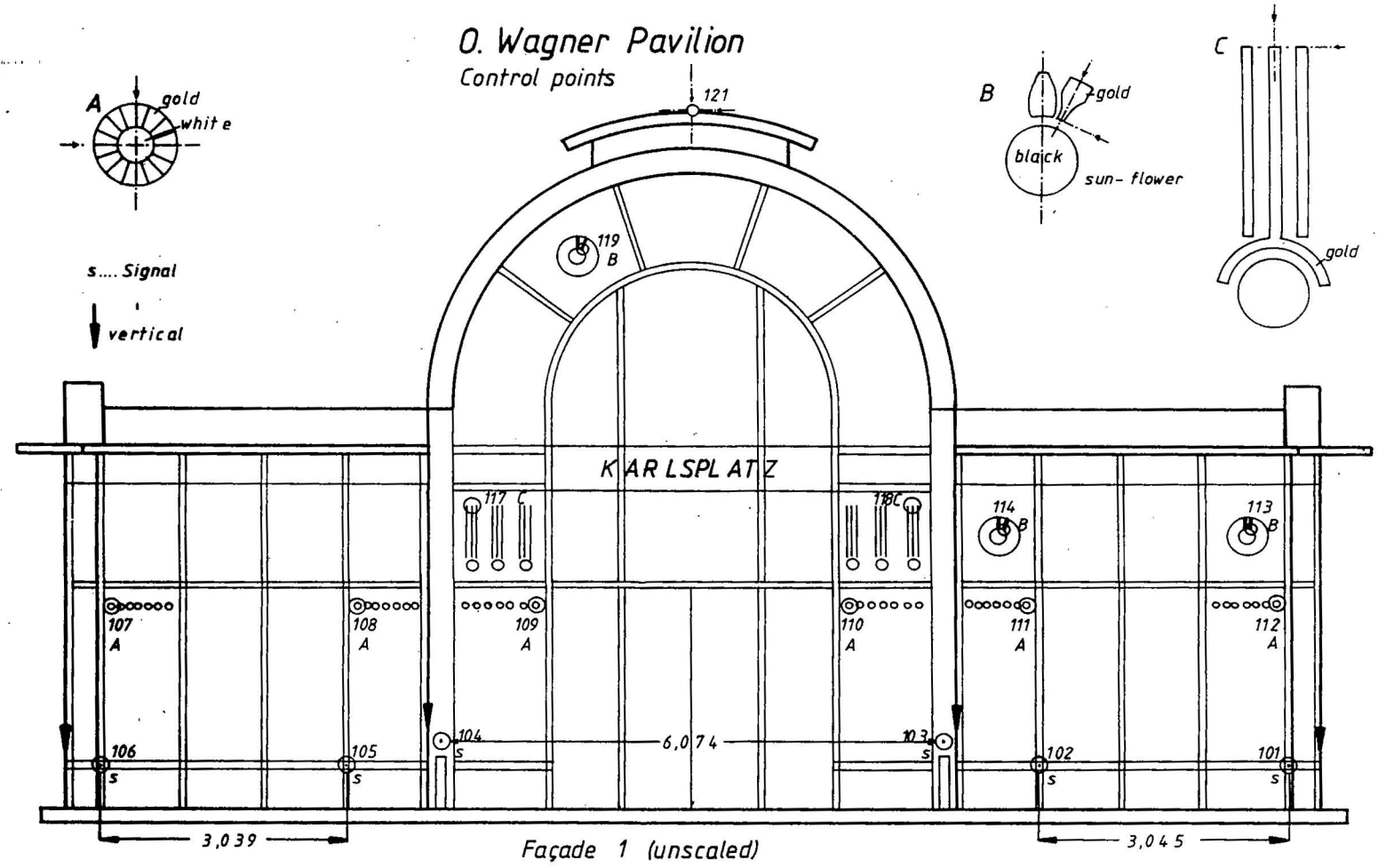

Fig.2 The arrangement of control information.
(Example for one of the four sides)

The work to be done is:

- to compare	bundle adjustment software;
- to compare	pre-calibration with self-calibration;
- to compare	metric with non-metric cameras;
- to compare	medium and small format results;
- to compare	measuring devices/systems;
- to compare	results of various institutes/persons;
- to test	new methods/systems, e.g. CCD;
- to test	the 3x3 rules of CIPA [1];
- to find out	the optimum/minimum control information [2];
- to use	materials for teaching/training;
- to make	better proposals;
- to demonstrate	results to CIPA and to others.

The material will be used also by seven university institutes of photogrammetry within a Hexagonale project started in 1991: Cracow, Brno, Bratislava, Budapest, Zagreb, Ljubljana and Vienna.

The results will be the basis for reports to CIPA which will be prepared together with, by and in cooperation of

- Arq. A. Almagro, Granada (Conservation, Photogrammetry)
- Dr. J. Jachimsky, Cracow (Photogrammetry)
- Dr. T. Fiedler, Zagreb (Photogrammetry)
- Dr. A. Detreköi, Budapest (Software comparisons, Photogrammetry)
- Dr. P. Patias, Thessaloniki (Centre pilote, Photogrammetry and Statistics)

and the author as well as others for new aspects, e.g. digital cameras, video-photogrammetry etc., whatever interests arise. The Vienna Institute of Photogrammetry assists in or takes care for photography and control data and can provide applicants with general bundle adjustment software (ORIENT) suitable to treat data from non-metric photography properly [3].

The Vienna Institute of Photogrammetry invites all Very Interested Persons in architectural photogrammetry to join the group, the "VIP-Club", with new ideas and new activities.

Summary:
The Vienna Institute of Photogrammetry and Remote Sensing has prepared a test object for architectural photogrammetry meant as a basis for international comparison of methods and technologies. It will be used by the CIPA Working Group 1 on Control information as well as by university institutes for training in analytical photogrammetry with metric or non-metric photography and general bundle adjustment including geodetic polar data. The test materials are available (against cost-price) for all those who are interested to compare their own methods of architectural photogrammetry with those of others or to check own new technology.

Bibliography:

[1] Waldhäusl P. and Brunner M.
Architectural Photogrammetry World-wide and by Anybody with Non-metric Cameras? In: Georgi Hadjiev (Editor), Proceedings of the XIth International Symposium of CIPA, Sofia, 4.-7.10.1988. "Contribution of Modern Photogrammetry, Remote Sensing and Image Processing Methods to the Architectural and Urban Heritage". Sofia, 1989, pp. 35 - 49.

[2] Peipe J. and Waldhäusl P.
Control Information in Architectural Photogrammetry.
Invited paper, 13th International Symposium of CIPA,
Cracow, 23.-26. October 1990.

[3] Kager H. and Waldhäusl P.
ORIENT - A Universal Photogrammetric Adjustment System.
Product information, Institute of Photogrammetry and
Remote Sensing, Technical University Vienna, 1990, 20 pp.