

CAMERA CALIBRATION CERTIFICATE

CAMERA TYPE : RC 30
LENS TYPE : 30/4 NAT-S
LENS NO. : 17124

Calibration date: 12.02.1997

LEICA AG, HEERBRUGG



*Leica Heerbrugg Ltd
CH-9435 Heerbrugg*

*Calibration Department
Supervisor*

FO188

Aperture: 4.0
 Filter on goniometer: VIS (400 - 700 NM)
 Filter on camera: --
 Principal distance for focussing distance 850 m : 303.15 mm

Radial distortion (micrometers) referred to principal point of symmetry (PPS)
 (Positive values denote image displacement away from center)

| Radius mm | Half - Sides | | | | Mean |
|--------------|--------------|------|------|------|------|
| | 1 | 3 | 2 | 4 | |
| 10 | -0.4 | 0.2 | -0.9 | 0.0 | -0.2 |
| 20 | -0.9 | -0.5 | -1.3 | -0.5 | -0.8 |
| 30 | -1.3 | -0.6 | -1.3 | -1.0 | -1.0 |
| 40 | -1.1 | 0.1 | -1.1 | -0.1 | -0.5 |
| 50 | -0.6 | -0.1 | -0.6 | -0.1 | -0.3 |
| 60 | -0.8 | 0.2 | 0.6 | -0.2 | 0.0 |
| 70 | -0.2 | -0.2 | 0.4 | -0.2 | 0.0 |
| 80 | -0.6 | 0.8 | 0.7 | 0.3 | 0.3 |
| 90 | -0.1 | 0.7 | 0.6 | 0.4 | 0.4 |
| 100 | -0.9 | 0.5 | 0.8 | -0.2 | 0.0 |
| 110 | -1.5 | -1.6 | 0.1 | -0.2 | -0.8 |
| 120 | -1.9 | -2.1 | -1.7 | -0.7 | -1.6 |
| 130 | -1.4 | -1.4 | -0.3 | 0.4 | -0.6 |
| 140 | -0.3 | -1.1 | 1.2 | 1.2 | 0.2 |
| 148 | 2.7 | 1.6 | 3.7 | 3.4 | 2.8 |

Photographic resolution (line pairs per millimeter)

International 3-line test-chart, contrast (log) : 2.0

Aperture: 4.0
 Filter: 450 NM
 Film: KODAK PANATOMIC X 2412
 Developer: KODAK HC110

| Angle (deg) | 0 | 5 | 10 | 15 | 20 | 25 |
|-------------|-----|-----|-----|-----|-----|----|
| Radial: | 118 | 117 | 116 | 114 | 111 | 96 |
| Tangential: | 118 | 117 | 114 | 110 | 104 | 87 |

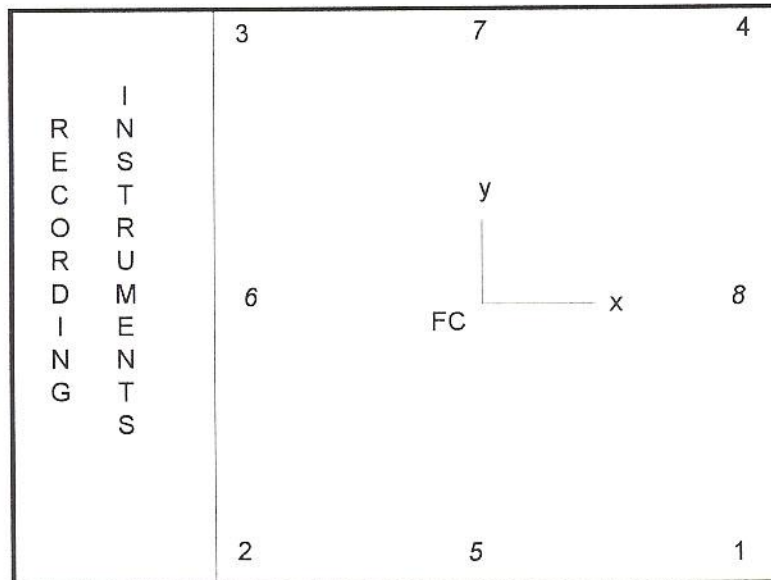
AWAR (Area weighted average resolution) in lp/mm: 109

Principal point of autocollimation (PPA) and principal point of symmetry (PPS)
 referred to central cross (FC), see diagram

| | x (mm) | y (mm) |
|-----|--------|--------|
| PPA | 0.013 | 0.010 |
| PPS | -0.015 | 0.006 |

Fiducial marks, referred to central cross (FC)

| | x (mm) | y (mm) | | x (mm) | y (mm) |
|---|----------|----------|---|----------|----------|
| 1 | 106.003 | -106.002 | 5 | 0.001 | -111.998 |
| 2 | -106.001 | -106.001 | 6 | -112.002 | 0.005 |
| 3 | -106.003 | 106.002 | 7 | 0.000 | 112.002 |
| 4 | 106.002 | 106.002 | 8 | 111.998 | 0.002 |

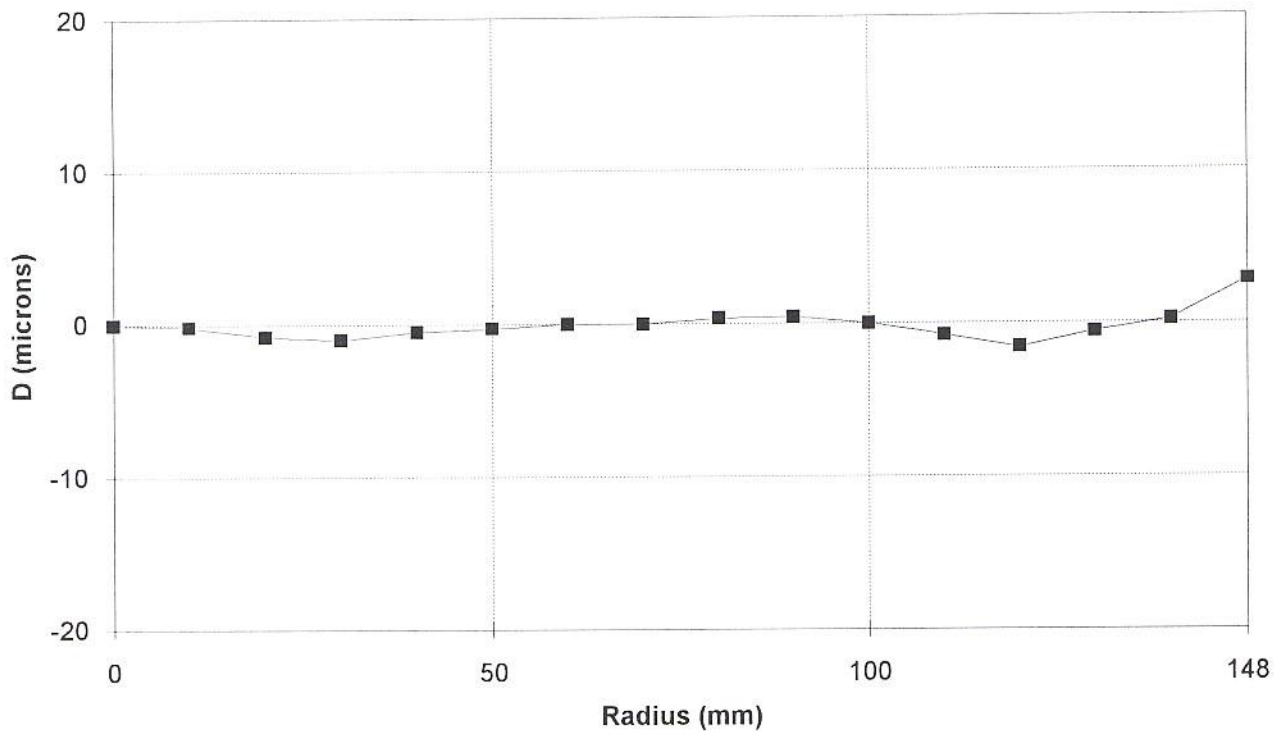


as seen on focal plane frame

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Aperture: 4.0
Filter on goniometer: VIS (400 - 700 NM)
Filter on camera: --
Principal distance for focussing distance 850 m : 303.15 mm

Mean radial distortion



Radial distortion for semi-diagonals referred to PPS

