NATIONAL BUREAU OF STANDARDS

REPORT OF TEST 182441-1

on

WILD AERIAL MAPPING CAMERA TYPE RC8

Equipped with
Wild Aviogon Lens No. 272

Submitted by
Aero Service Corporation
210 E. Courtland Street
Philadelphia, Pa. 19120

The lens contained in this camera has a nominal focal length of 6 inches and maximum aperture of f/5.6. All measurements were made at aperture f/8, because of limitations imposed by the apertures of the camera calibrator. These measurements were made with collimated incident light, using a K-3 filter, a tungsten source and Eastman Kodak spectroscopic emulsion Type V-f, IV-N, and Aerographic Plus-X on micro flat glass plates. Development was in D-19 at 68°F for three minutes with continuous agitation.

I. Focal Lengths

	Visible	Infrared
Equivalent focal length	152.60 mm	152.71 mm
Calibrated focal length	152.57 mm	152.66 mm

The probable errors of these determinations of focal length do not exceed ±0.10 mm.

II. Distortion

β	$\bar{D}_e$	$\bar{D}_c$	D_c for azimuth angle A 0°	B 90°	C 180°	D 270°
degrees	μ	μ	μ	μ	μ	μ
0	0	0	0	0	0	0
7.5	0	4	4	4	4	4
15	-1	6	7	7	6	6
22.5	-9	3	4	6	2	1
30	-17	0	2	5	-4	-3
37.5	-30	-6	-5	-1	-10	-10
45	*	*	*	*	*	*

Values of the distortion are measured for each of four radii of the focal plane separated by 90° in azimuth. Values of the distortion based upon the equivalent focal length D_e are determined for points separated by

7.5° from the axis for each of the four radii. The average value of $\bar{D}_e$ is reported. From these values of $\bar{D}_e$, a calibrated focal length is derived to minimize the average value distortion over the entire field. The average value of the distortion referred to the calibrated focal length is given under the heading $\bar{D}_c$. Values of the distortion $\bar{D}_c$, based on the calibrated focal length determined for each of the four radii, are listed under the azimuth angles 0, 90, 180, and 270 degrees. The values of the distortion are given in microns and indicate the displacement of the image from its distortion-free position. A positive value indicates a displacement from the center of the plate. The probable error does not exceed ±10 microns.

* Fiducial marks in corners cut out 45° determinations.

III. Resolving Power

Emulsion	0°	7.5°	15°	22.5°	30°	37.5°	45°
V-F							
Tangential	76	76	53	46	39	27	*
Radial	76	76	63	63	53	46	*
Plus-X							
Tangential	53	53	46	32	27	23	*
Radial	53	53	53	53	46	39	*
IV-N Infrared							
Tangential	32	32	32	27	23	16	*
Radial	32	32	32	32	32	32	*

The values of the resolving power are given at 7.5° intervals from the center of the field and are obtained by photographing suitable test charts comprised of patterns of parallel lines. The series of patterns of the test chart are imaged on the negative with the lines spaced in a geometric series of the fourth root of two lines to the millimeter. The row marked "tangential" gives the number of lines per millimeter in the image on the negative of the finest pattern of the test chart that is distinctly resolved into separate lines when the lines lie perpendicular to the radius drawn from the center of the field. The row marked "radial" gives similar values for the pattern of test lines lying parallel to the radius.

* Fiducial marks in corners cut out 45° determinations.

IV. Principal Point of Autocollimation

The lines joining opposite pairs of collimation index markers intersect at an angle of 90° ± 1 minute, and their intersection indicates the location of the principal point of autocollimation with a probable error not exceeding ±0.03 mm.

V. Collimation Marker Separation

A - C	299.83 mm
B - D	299.81 mm

The probable errors in these separations do not exceed ±0.02 mm.

VI. Tangential Distortion

0°	±22.5°	±30°	±37.5°
0	1	2	2

The values of the tangential distortion are measured in microns and indicate the displacement of the image from its distortion-free position. These values represent a displacement of the central image from a straight line connecting corresponding image points at equal but opposite angular separations from the axis. The probable error does not exceed ±5 microns.

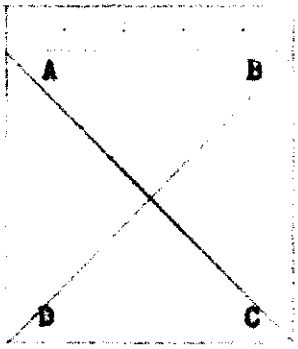
VII. Filters

The Wild 450 PAN 13X No. 1735 filter accompanying this camera has surfaces plane parallel to within ten seconds of arc.

VIII. Magazine Platen

The film platen mounted in Wild Type RC8 magazine No. 544 submitted with this camera does not depart from a true plane by more than ±0.0005 inch.

Fiducial Marker Location



Location of referenced diagonals with respect to the corner fiducial markers. The camera is indicated as viewed from the back.

For the Director,

Francis E. Washer, Chief
Refractometry Section
Metrology Division

NBS Report No. 182441-1
October 9, 1964

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FORM NBS-259
(REV. 4-11-63)

U.S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
WASHINGTON, D.C. 20234

NATIONAL BUREAU OF STANDARDS
REPORT OF TEST

182441-2

on

ONE AERIAL CAMERA MAGAZINE PLATEN

Mounted in

WILD MAGAZINE TYPE RC8
No. 545

Submitted by

Aero Service Corporation
210 E. Courtland Street
Philadelphia, Pa. 19120

The film platen mounted in Wild Type RC8 magazine No. 545 does not depart from a true plane by more than ±0.0005 inch.

For the Director,

Francis E. Washer, Chief
Refractometry Section
Metrology Division

NBS Test Report No. 182441-2
October 9, 1964
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