25 x 100 binoculars- By Anna and Terry Vacani

Zeiss 25x100 binocular *flm* WWII

1. The short history of binocular production

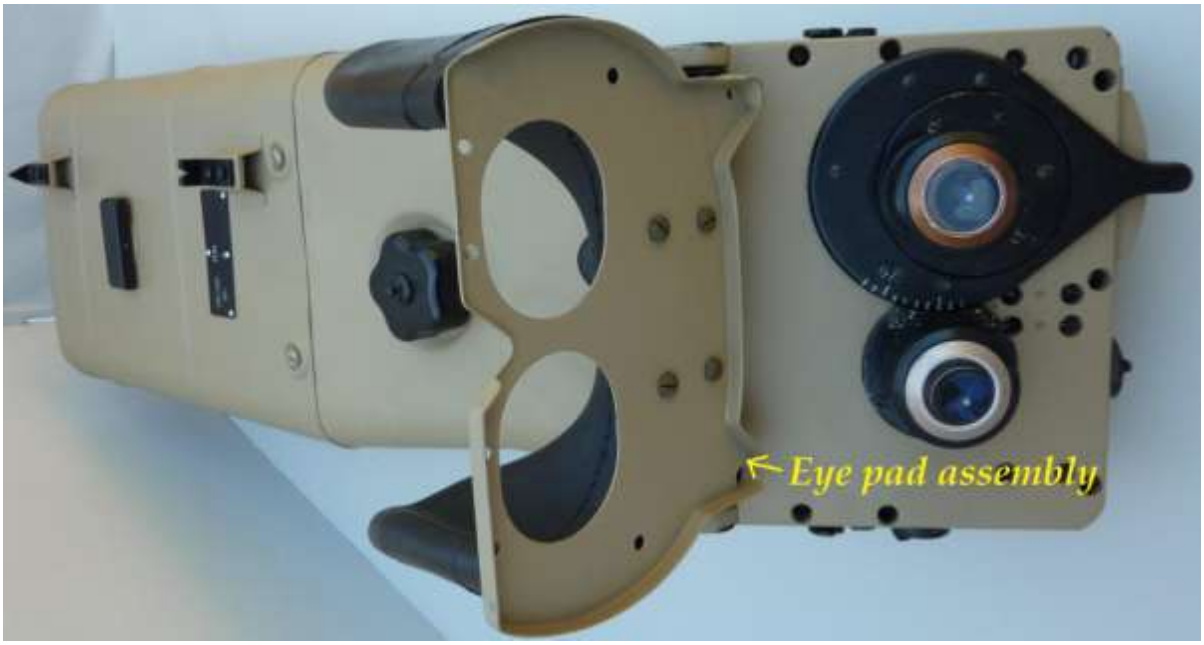
The binoculars were made by Feinapparate Bau G.m.b.H., Werk Thurn (*flm*).[1][1] This Company was founded in 1939, and was fully owned by Carl Zeiss Jena until May 1945.
The first 25x100 models were marked 'Carl Zeiss'. Then marking was changed to *'blc'*, and after that was changed to *'rln'*. The last production of this model was marked *'flm'*. The production of 25x100 flm began in 1944 in Werk Thurn (Teplice in Czech, at the present time).
The 25x100 was designed to be mounted on a large rangefinder to locate night flying aircraft. The binocular was used at the experiments with the V1 and V2, to follow a trajectory of the missiles V1 and V2.
To the end of the war (late 1944 – early 1945), 3.000 binoculars with code *flm* were produced.

2. Production after the WWII

It is difficult to precisely describe the further production history, of the binoculars 25x100, after the war. No documents have been found that were published from that period.
We have heard information from some collectors who visited the factory, in Teplice Czech.
After the war the factory was nationalized.
In the factory many assembled binoculars were left which had not been delivered to the Wehrmacht.
After the war many of these binoculars were modified for civilian use. Some were exported to Sweden in original form.
Binoculars that were modified for civilian use were sold under the name "Somet" later "Meopta".
The binoculars' construction has not changed except the name plate.
The changes made to the external features are as follows.
- The colour was changed from German army beige colour; It was repainted with texture paint, some a cream colour, some grey and some dark green;

25 x 100 in the box; Copyrights picture Anna Vacani

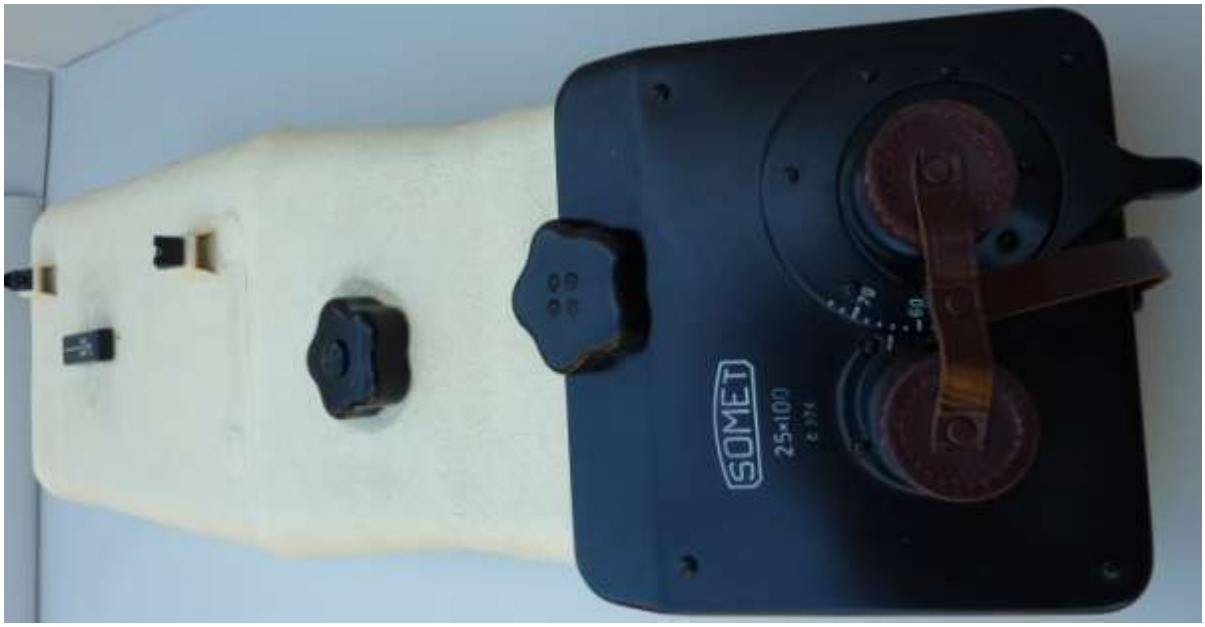
- The bracket was removed – the bracket and rubber eye pad assembly;



Eye pad assembly; Copyrights picture Anna Vacani

- The reticule unit and adjusters were removed; The dovetail for the reticle lamp mounting was removed;
- The two air drying ports were removed;
- The holes left by removing these parts were filled up with putty;
- The metal eye piece, focusing rings, had a thread put on the top to take plastic eye cups;

- The top body over the prism box (housing box) was covered with aluminium pressing plate, painted black, with the name “Somet” or later “Meopta”.

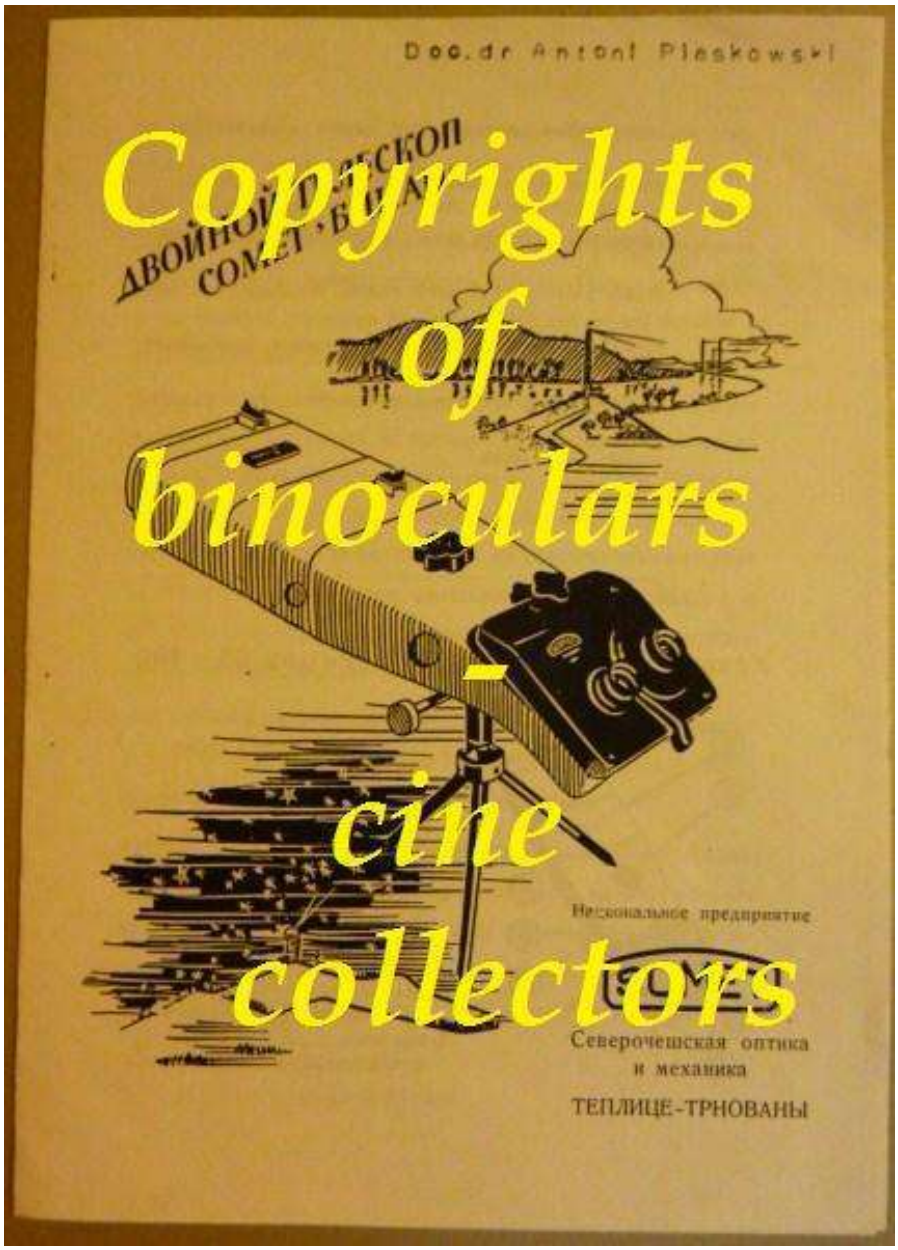


Somet 25 x 100; Copyrights picture Anna Vacani

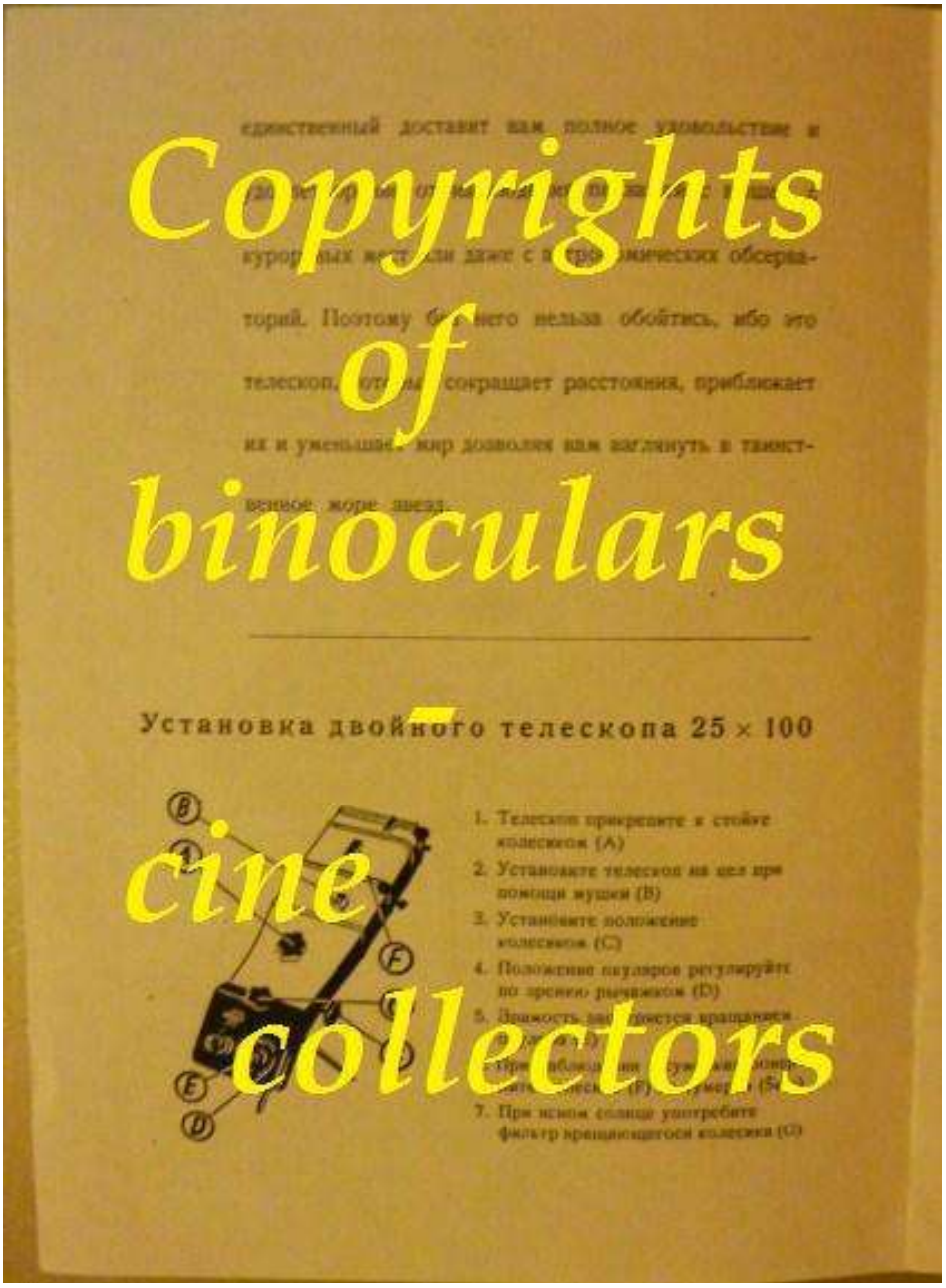
Only one external feature of the outside body was not changed – the code *‘flm’* and the serial numbers underneath.

The place of the serial number of all 25 x 100; Copyrights picture Anna Vacani

Summarizing the features which were changed we can say they were only cosmetic changes. The optical and mechanical constructions of the binocular remain as original as it was designed previously.
It is difficult to say when the factory change name from “Somet” into “Meopta”. It appears as the National Company Meopta united four factories, among them: Optikotechna (Opticotechna G.m.b.H in Prerau during the war – war time cod ‘dow’)[2]; Somet and others. Presumably the unification with Meopta took place in the early 1950s. These changes are not specified on the new web site of the “Meopta” company.
In our collection, we have a copy of the leaflet issued by the factory Somet - National Factory “Somet” North Czech Optics and Mechanics, Teplice-Trnovany.
In the leaflet is described the binocular Somet 25x100 with the instruction, how to use the binocular and all technical details. The last page advertised other optical instruments produced in the factory. The leaflet is in Russian language.



The leaflet issued by the factory Somet from our collection- page 1



The leaflet issued by the factory Somet from our collection- page 2

In 1946 the Czech astronomer, Ludmila Pajduškowa, had discovered her first new comet (look into chapter 4). This is mentioned in the leaflet.
When the factory changed its name again to Meopta, the name on the binocular plate changed as well.

Meopta 25 x 100; Copyrights picture Anna Vacani

After the war, as is visible in the picture, “Somet” made its own construction for this model which was a special table top tripod.

In the leaflet is additional information: “On request we add a special device for attaching binocular to a table with screws for permanent mounting in wood”.

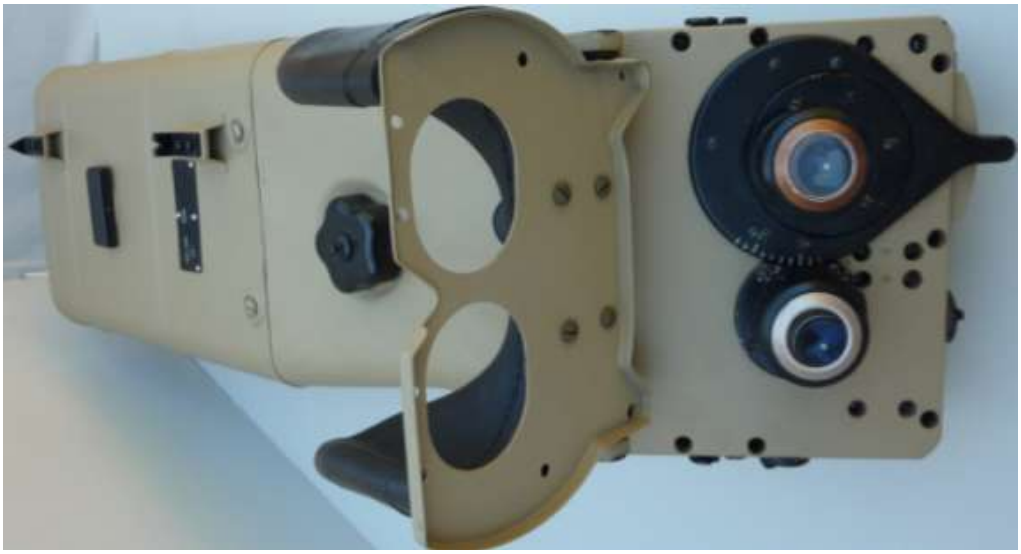
The device for attaching binoculars to a stable base

3. The technical information

It was conceded to be one of the finest binocular this is ever built. The real field of view of this instrument in angular measure is 3.6 degree, with an apparent field angle of 90 degrees. Field of view in 1000 meters is 64 meters.
Diameter of the exit pupil is 4 mm. Light transmitting capacity – 16, in the factory's leaflet is underlined this feature as given an opportunity for observing during the dusk.
The next information, included and highlighted in the leaflet, is possibility of astronomical observation stars like comets, as far as to number 9, in the Morgan-Keenan system, of star classification.
Placing the binocular on the tripod built up by "Somet" it is possible to observe an object in much position.
The tripod has built articulated joints, and thanks to that it can handle in a level plane 360 degrees and tilt vertically below the horizon in 45 degrees, above the horizon in 75 degrees.[3]

Flm production No 284025 in our collection; The binocular was completely and professionally serviced by Terry Vacani.
The body was manufactured from two metal parts. One is steel casting and the other is welded sheet metal stampings.
The binocular has a forehead rest.
The condition of the binocular in our collection is very good. Optically it is excellent; no scratches, no chip.
The binocular is in perfect collimation. The glass elements all are fully coated. It has built in neutral density filters.
Underneath of the prism box is the number. All knobs and mechanisms work very well.

25 x 100 in the box; Copyrights picture Anna Vacani



25 x 100; Copyrights picture Anna Vacani

The prism system is a roof-deviation combination with 60 degree exit face. In the book

'Militärische Ferngläser und Fernrohre in Heer, Luftwaffe und Marine' by Dr Hans T. Seeger is the drawing of the prism system: [4]

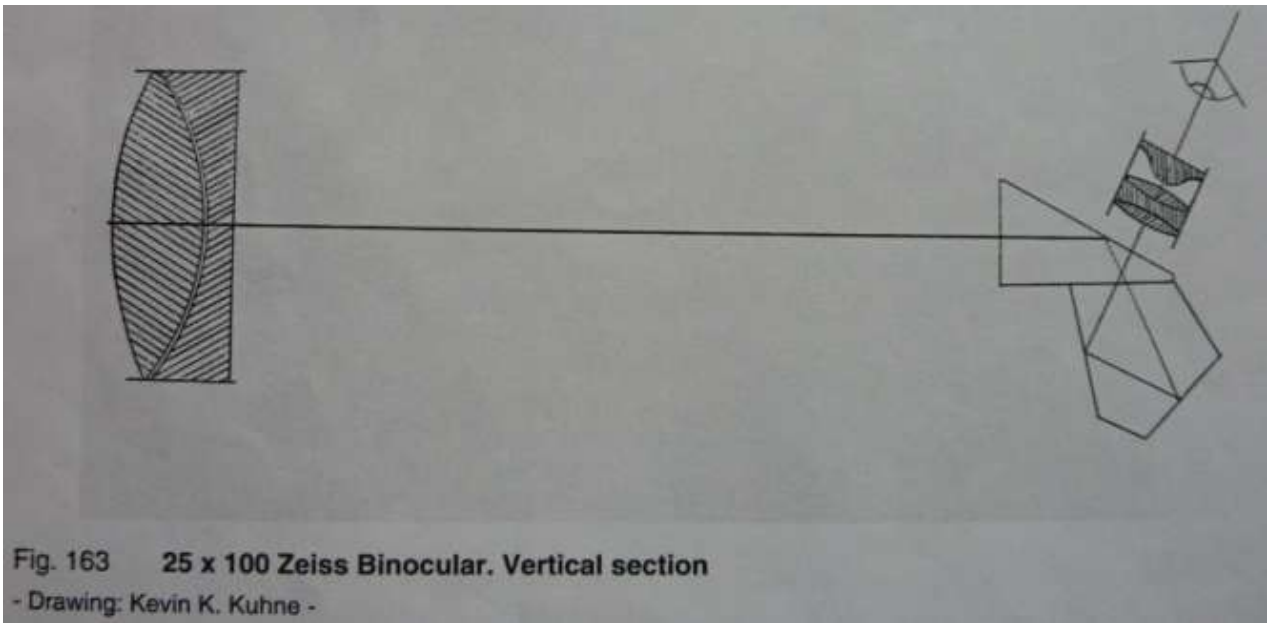
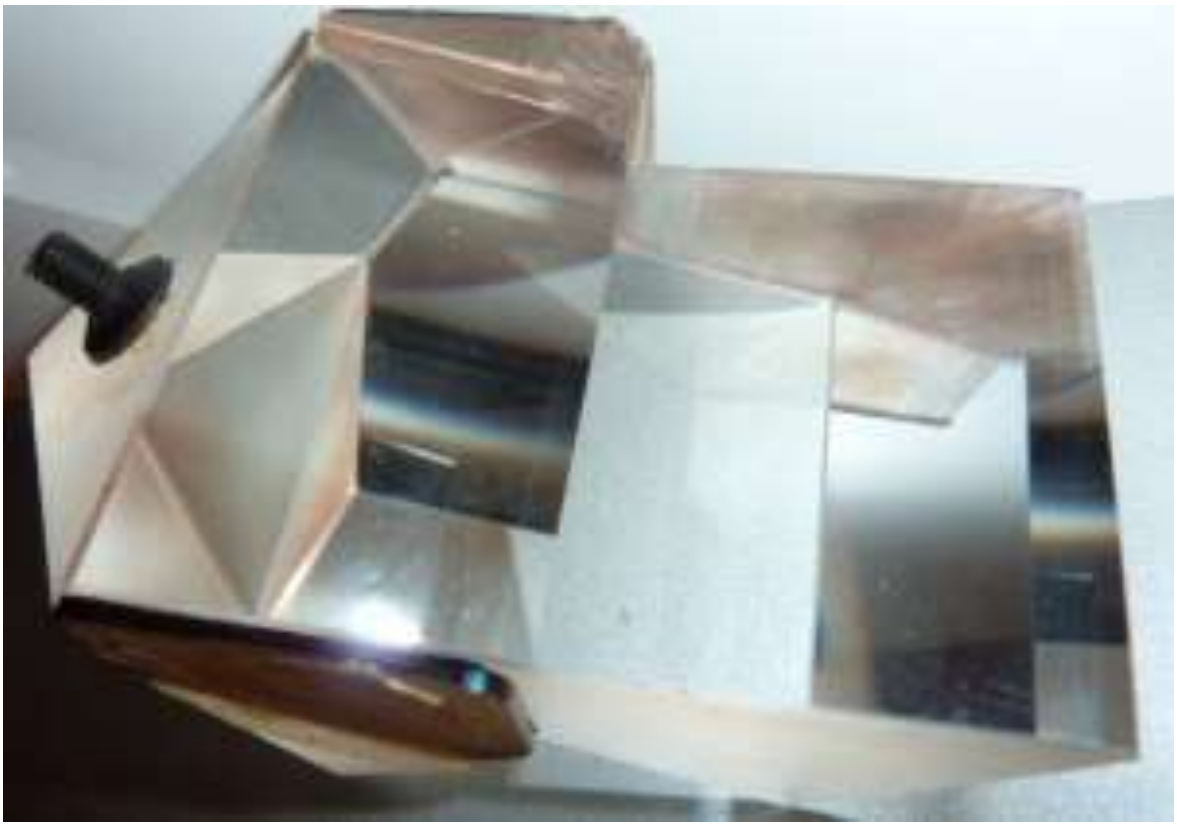
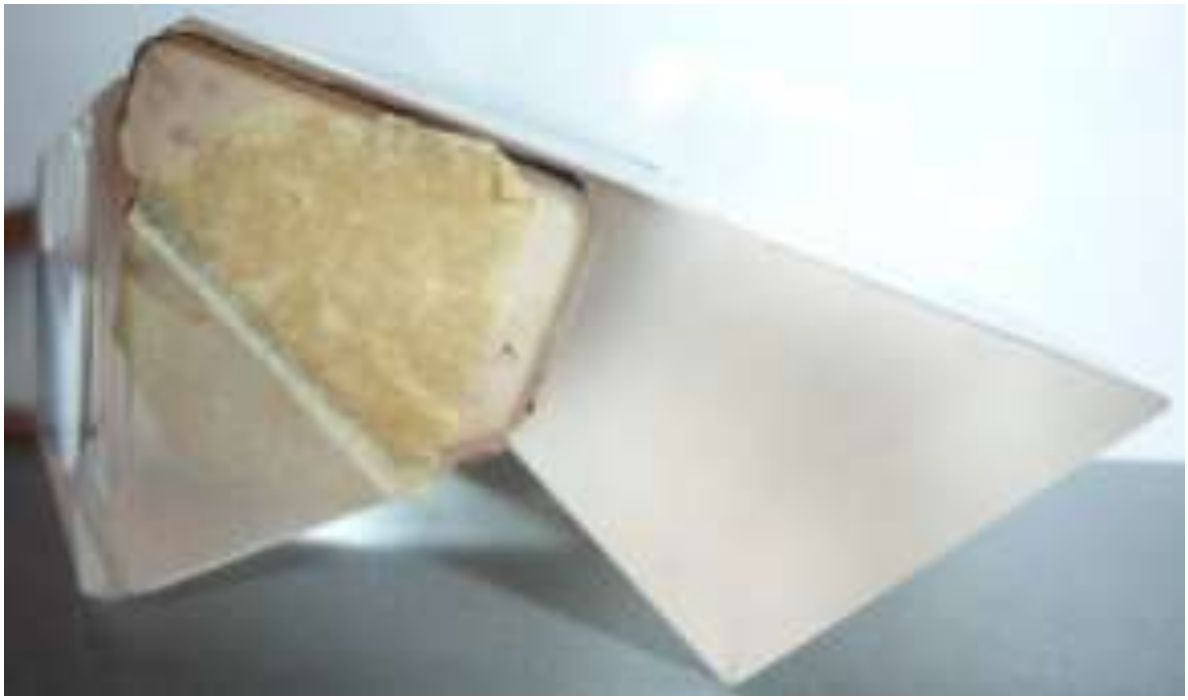


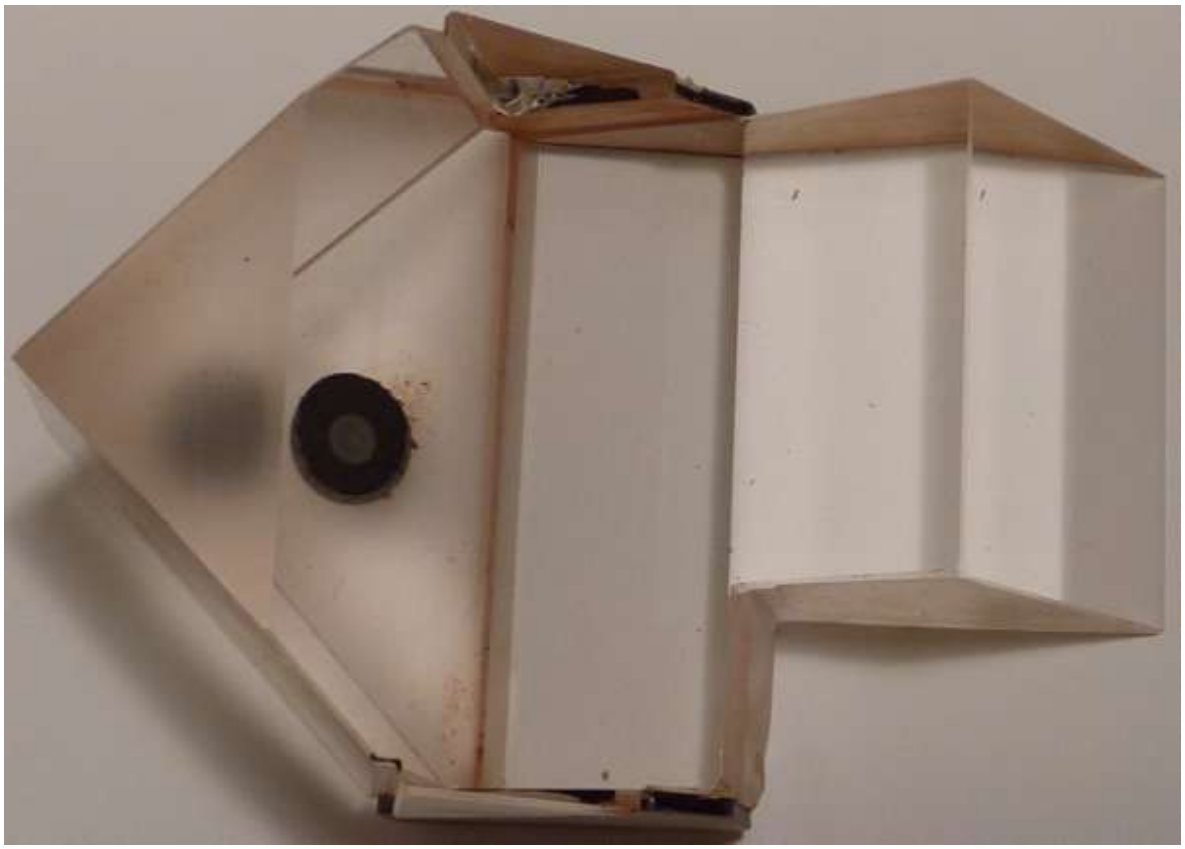
Fig. 163 **25 x 100 Zeiss Binocular. Vertical section**
- Drawing: Kevin K. Kuhne -



The picture of the original prism from a damaged binocular; Copyrights picture Anna Vacani



The picture of the original prism from a damaged binocular; Copyrights picture Anna Vacani



The picture of the original prism from a damaged binocular; Copyrights picture Anna Vacani

The picture of the original prism from a damaged binocular; Copyrights picture Anna Vacani

The prism has extremely flat surface. It is assembled only by vacuum without balsam-glued. It has two plates of glass which are adhered to the prism assembly with plaster, on each side.

The ocular is built up from four elements including an aspheric lens. The eyepieces are of orthoscopic design with the eye lens having an aspheric curve, in this case parabolic, consequential in a large evident field angel:

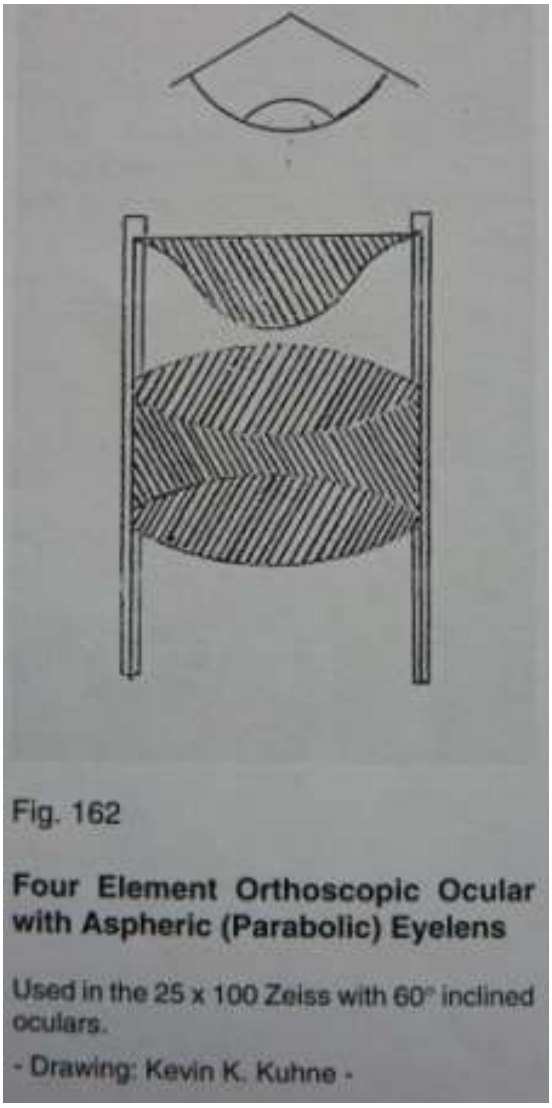


Fig. 162

Four Element Orthoscopic Ocular with Aspheric (Parabolic) Eyelens

Used in the 25 x 100 Zeiss with 60° inclined oculars.

- Drawing: Kevin K. Kuhne -

The left – hand ocular is provided with an illuminated reticule.
The binocular has a very high light transmission, which gives a much brighter picture than the 'kqc' Schneider 25x105.

4. Used in Astronomy

This extremely high light transmission of the binocular gives the possibility to observe the sky in the night. In July 1992, Magazine' Sky & Telescope' published an article about the members of the Czech Astronomical Society. This Society discovered 18 comets from 1946 to 1959 using 25x100 binoculars produced in Czech by Carl Zeiss Jena, during the WWII. Here is the article and the pictures from our collection.

Amateur Astronomers

Conducted by Stephen James O'Meara

Ludmilla Pajdusakova ranks third among women comet discoverers, yet her name survives only in relative obscurity. Brian Marsden photographed her in 1967 at Skalnate Pleso Observatory in Czechoslovakia. She's looking through the 25 × 100 binoculars with which she discovered six comets.

THE FORGOTTEN COMET HUNTER OF SKALNATE PLESO

EVERYONE in today's astronomical community is likely to recognize the name Carolyn Shoemaker. With the sole exception of the great 19th-century French observer Jean-Louis Pons, she is the most successful comet discoverer in history. Certainly, in a field dominated by men, Shoemaker's accomplishment shines all the more extraordinarily.

But she is not the first of her gender to achieve comet fame. Two centuries ago, for example, Caroline Herschel, the astronomically proficient sister of William Herschel, discovered eight comets. Likewise, during the mid-19th century Maria Mitchell of Nantucket Island received a gold medal for her discovery of Comet 1847 VI, and she is known to have independently sighted several others.

Yet, in a field with such potential for lasting fame, fate can be very fickle indeed. The names of some comet discoverers have remained familiar literally for centuries. Yet other people, sometimes equally distinguished when they were productive, have slipped into obscurity. Ludmilla Pajdusakova is one of the latter. She deserves to be better remembered, however, both for her individual successes and for her contribution to a unique comet-hunting program conducted in Czechoslovakia.

During World War II observatories were understaffed, and new instruments were essentially unobtainable. New institutions were small and often poorly equipped, few flourished, and many others succumbed even before the echoes of war had faded.

In 1943 Antonin Becvar founded Skalnate Pleso Observatory, a relatively modest (even austere) stone structure with large domes appended to either end. The observatory's location in the craggy windswept Tatra Mountains gave it a singularly inhospitable, almost sinister, appearance, particularly in winter. At an elevation of 5,850 feet, the observatory was well placed for astronomical research, but it was short on equipment. A 24-inch

Zeiss reflector served as the main telescope, which was supplemented largely by small, wide-field astrocameras.

In early 1946 Becvar obtained a few pairs of giant binoculars. Called Somet-Binars, these 25 × 100 instruments had Zeiss optics that provided a huge, yet well corrected 3°.7 field of view. The eyepieces were tilted at a 60° angle to the optical axis, so they were ideally suited to scanning the heavens in relative comfort.

Becvar worked with a limited staff of mainly young astronomers. Among them was Pajdusakova, then a 28-year-old specialist in solar research. At the end of the war the focus of Czech astronomy was rapidly turning toward comets and interplanetary matter, and Becvar thought his staff should proceed with such studies. And to what better purpose could these wonderful binoculars be put than comet hunting?

A systematic program of comet sweeping was quickly established. The procedure called for nightly searches using multiple observers. In the tradition of comet hunters since the time of Charles Messier, the Czechs made horizontal sweeps of the sky, starting low in the west after dusk and working up to 50° altitude. The technique was reversed when examining the eastern sky before dawn. Each session required 60 to 90 minutes of sheer concentration. Most of the Skalnate Pleso staff participated in the program, including Becvar.

Pajdusakova was the first to succeed; on May 30, 1946, she discovered a 7th-magnitude comet in the morning sky. It was the first of five comets that by 1954 would carry her name. Pajdusakova actually found six comets, for late in September, 1956, she swept up a 10th-magnitude object that proved to be Periodic Comet Crommelin, returning after a 27-year absence. In a situation not unlike that of Periodic Comet Brorsen-Metcalf in 1989, Crommelin was some 10° from its anticipated location when Pajdusakova spotted it. Officially credited as a recovery, it was the last comet she was to find even though the Skalnate Pleso comet-hunting program continued until 1959. The operation lasted 13 years and produced an astonishing 18 discoveries by five observers.

Pajdusakova died in October, 1979, but little note seems to have been taken outside her native country. The obituary in the *Bulletin* of the Astronomical Institutes of Czechoslovakia cites her work on sunspots, coronal asymmetry, and comet discovery. Equally lauded is her presidency of the Slovak Astronomical Society from 1962 until 1974, through which she acted as an adviser to public observatories and astronomy clubs popularizing amateur astronomy throughout her country.

The fact that her comet-hunting efforts, by time-honored visual methods, brought her within two discoveries of Caroline Herschel's old record should be enough to save Pajdusakova's name from obscurity. That she was a part of one of the most innovative programs ever instituted at a professional observatory should assure it.

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[1] Liste der Fertigungskennzeichen für Waffen, Munition und Gerät (Nach Buchstabengruppen geordnet) Berlin 1944 Gedruck im Oberkommando des Heeres. Originalgetreuer Nachdruck, herausgegeben von Karl R.Pawlas, Publizistisches Archiv für Militär- und Waffenwesen. Nürnberg 1977 (ISBN 3 – 88088 – 214 – 2)

[2] As above

[3] With gratitude to Alicja Krynicka MA – Russian Philologist for her help with translation

[4] Hans T. Seeger - Militärische Ferngläser und Fernrohre in Heer, Luftwaffe und Marine; Military Binoculars and Telescope for Land, Air and Sea Service. Germany Hamburg 1995; ISBN 3-00-000457-2.