

The Nature Lover's Friend

Carl Zeiss did not invent the Porro-Prism binocular, but after he patented his design of a “prism binocular with widely separated objectives for increased depth perception” in 1883 his high quality “fieldglasses” or, as we call them now, binoculars, conquered the world. The name Zeiss became synonymous with binoculars and avid readers among you may remember having read in a novel of the protagonists having used “a Zeiss” to spy on someone.

It is at this point that I would like to share with you one of my favourite and most appropriate little poems. It was penned by the German author and poet *Christian Morgenstern (1871-1914)* and I give it to you first in an English translation:

A hare is sitting on a lea
Which, he feels certain, none can see.
But, armed with Zeisses of great strength,
Assiduously and at some length,
A man from a commanding height
Surveys the tiny spoon-eared wight,
Quite unaware that from on high
A God serenely views the spy.

And now Morgenstern's original version:

Ein Hase sitzt auf einer Wiese
des Glaubens, niemand sähe diese.
Doch im Besitze eines Zeisses
betrachtet voll gehalt'n'en Fleißes
vom vis-á-vis gelegn'nen Berg
ein Mensch den kleinen Löffelzwerg.
Ihn aber blickt, hinwiederum,
ein Gott von fern an, mild und stumm.

Those of you who love to explore nature *per pedes apostolorum* like to carry a pair of binoculars with them, but often find it a rather heavy burden on a long walk. There is now a wide choice of Mini-Binoculars (or, Taschen or Pocket binoculars) available for the serious hiker. Books have been written about Zeiss Binoculars, but I would like to mention only one particular model I happen to have in my collection: the Zeiss TELETUR, a 6x15 “Tourist Binocular”. (1918-1938) Fig.1. This little gem is not only one of the few Zeiss ever made with the objectives **closer** together than the eyepieces, it also weigh only about 250g with dimensions as small as 60 x 90mm. When I bought it at eBay it came from a seller in Slovakia.

For my 40th anniversary our VP presented me with one of the new Zeiss mini-binoculars 8x 20.B (Fig.2). This is a slim binocular with Schmidt prisms, central focusing and eyepieces for spectacle wearers. Its low weight of 170g at a length of 110mm is no burden to carry with you on a prolonged hike. Folded it even fits into a shirt pocket! Fig.3 (on p.6) shows the cross section of an 8x30B with the same prism arrangement (and one additional lens in the eyepiece). The Schmidt prism actually incorporates a roof edge prism (on the right side in the illustration). While the first 8x20 B had no correction for individual vision on one eyepiece since it was

supposed to be used with corrective eyeglasses,



my later model has such a feature (Fig.2): the left knob in the picture. The right one is for focusing. The rubber eyecups are folded back. The mini-binocular can be folded zig-zag by means of the two joints and then forms a tiny and compact unit that fits easily into the soft leather case provided.



But hold on! This is not intended to be an advertisement for Zeiss binoculars! I come now to the real reason for this article.

A smart fellow at Zeiss had an idea. There existed already a year-long experience with stereomicroscopes of the Galilean principle, which is actually a telescope (or two) stacked upon a large objective. What if we add an objective to a binocular and make a stereomicroscope? No sooner said than done. Zeiss designed a stereomicroscope conversion kit (Fig. 5) which consists of a simple stand with a prism set and common objective to be combined with a mini-binocular and, WOW, we have a small, portable and affordable stereomicroscope for the nature-loving hiker! (Fig. 4).

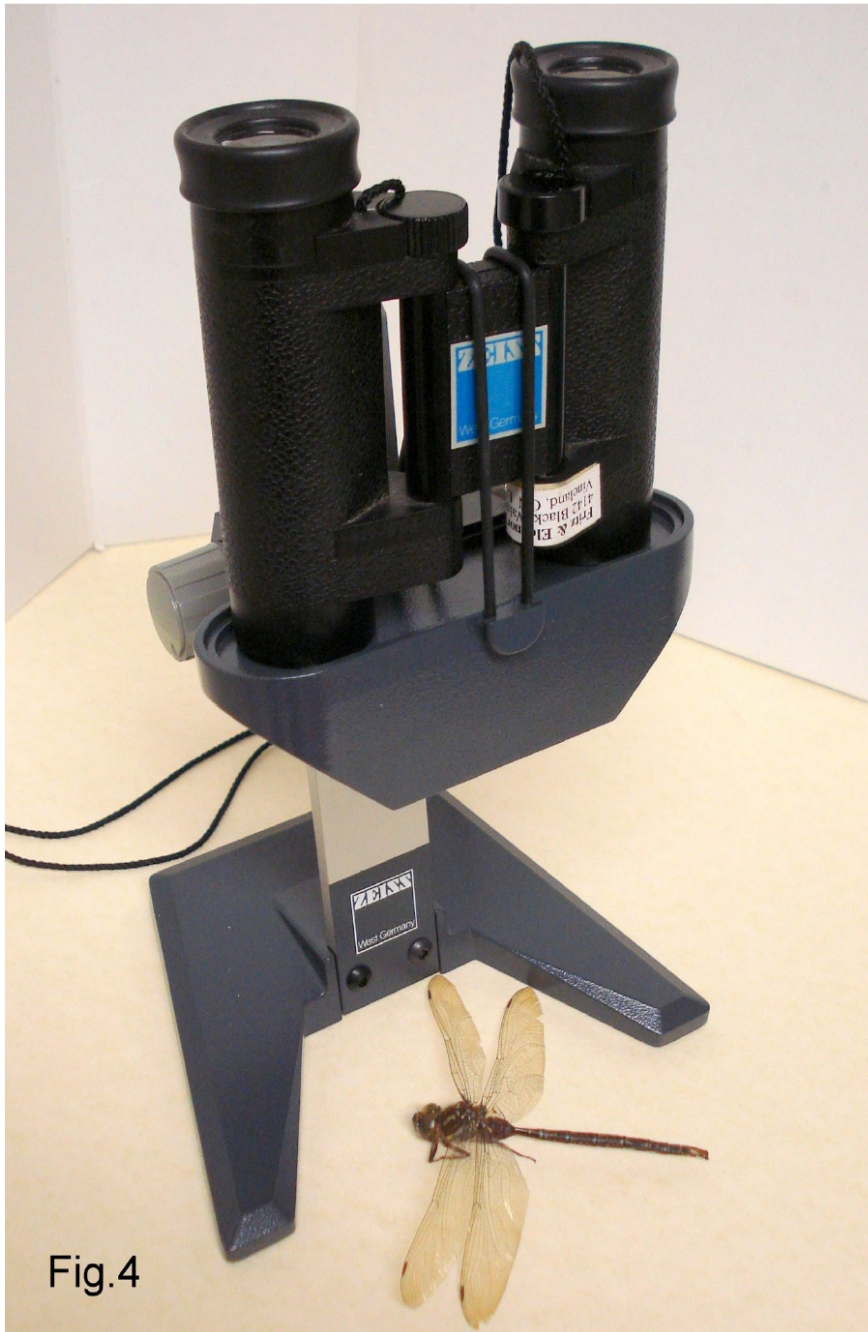


Fig.4

The stand folds flat, once the binocular is removed, and fit easily into a backpack or a larger jacket pocket. It weighs less than 500g. Any suitable mini-binocular can be attached by means of the rubber band. There are two knobs at the back for a friction focusing. The working distance is 120mm.

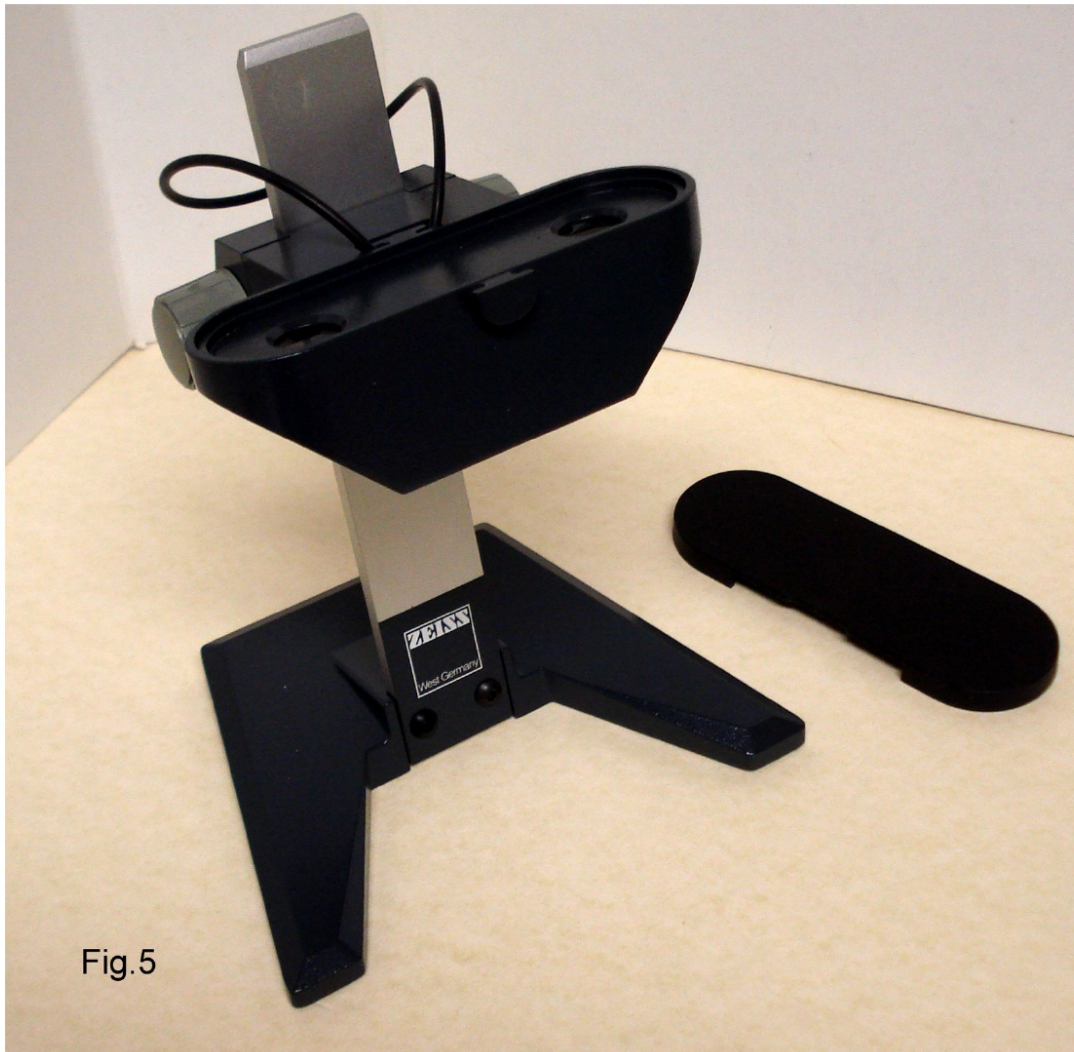


Fig.5

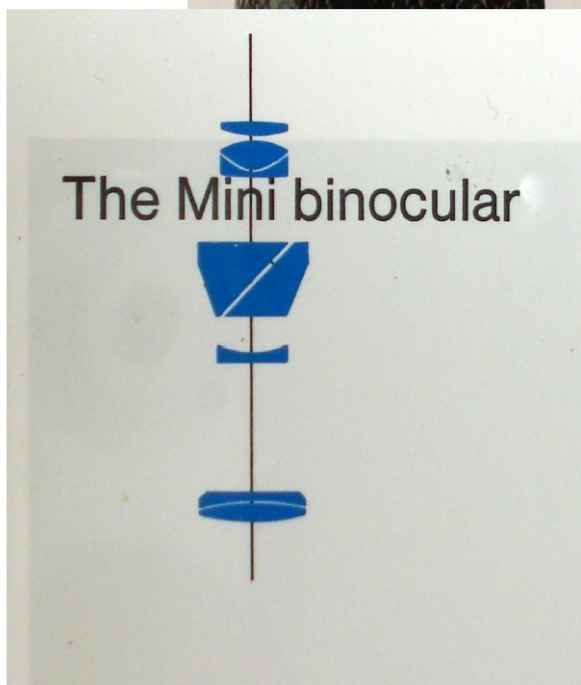
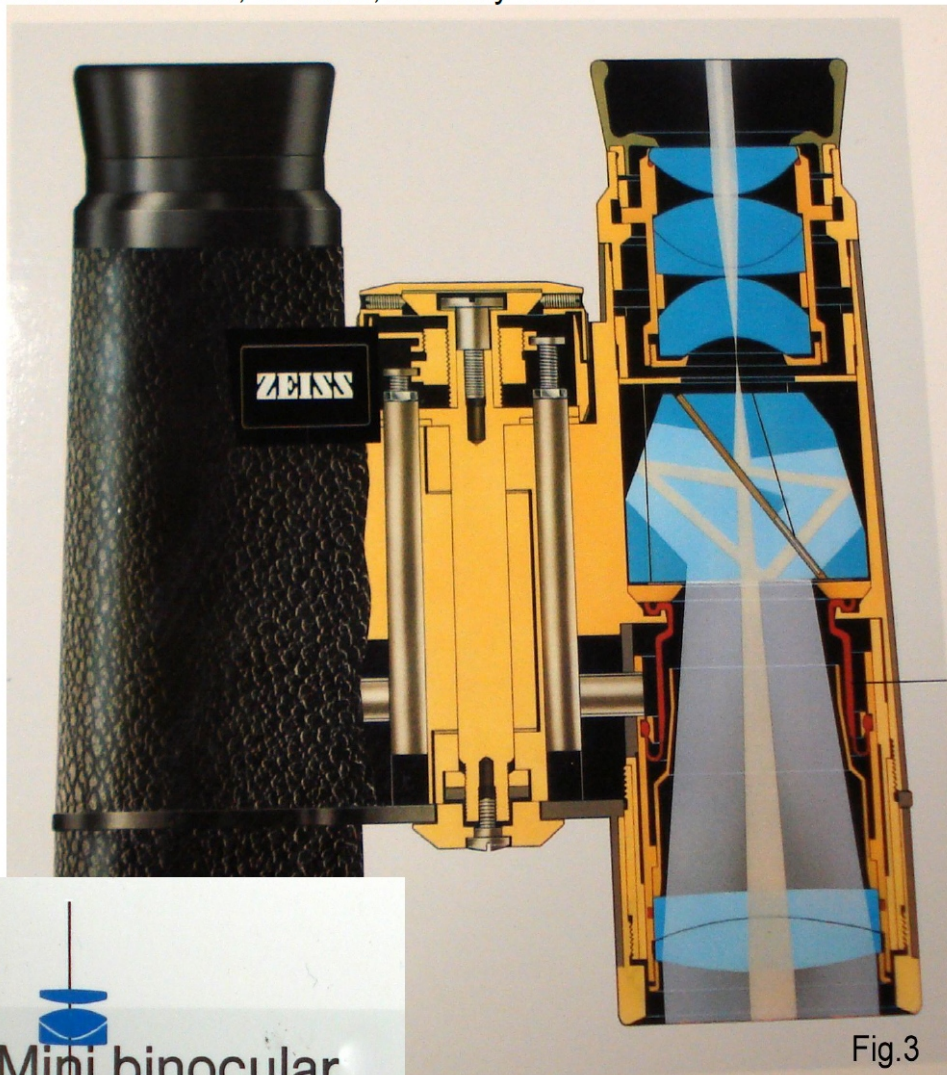
The stand folds flat once the binocular is removed and fits easily into a backpack. Any suitable mini-binocular can be attached by means of a rubber band. There are two knobs on the back for a friction focusing. The working distance is 120mm. Fig.5 shows the stand alone: the black body contains the combining prisms and common objective. A rubber band keeps the binocular in place. With the 8 x 20 binocular the magnification is approx. 14x.

Frankly, I don't know where you can nowadays get hold of this useful little gadget or whether it is still being manufactured. I never came across one on e-Bay. Pity, because it is most versatile and practical. Just for fun I tried it out with an ultra-cheap Tasco 10 x 25 mini-binocular (\$25.00 !!!). It worked, of course, but because of the slightly larger objectives it did not fit too well and required a longer rubber band (Fig. 6).



Fig.6

A tip for the nature-loving hiker: if you have a large enough magnifying glass of good quality just hold it in front of one objective of your binocular and focus on a flower or beetle, it works like a monocular microscope and yields a higher magnification than the magnifier alone. You will be amazed. You will need, however, a steady hand.

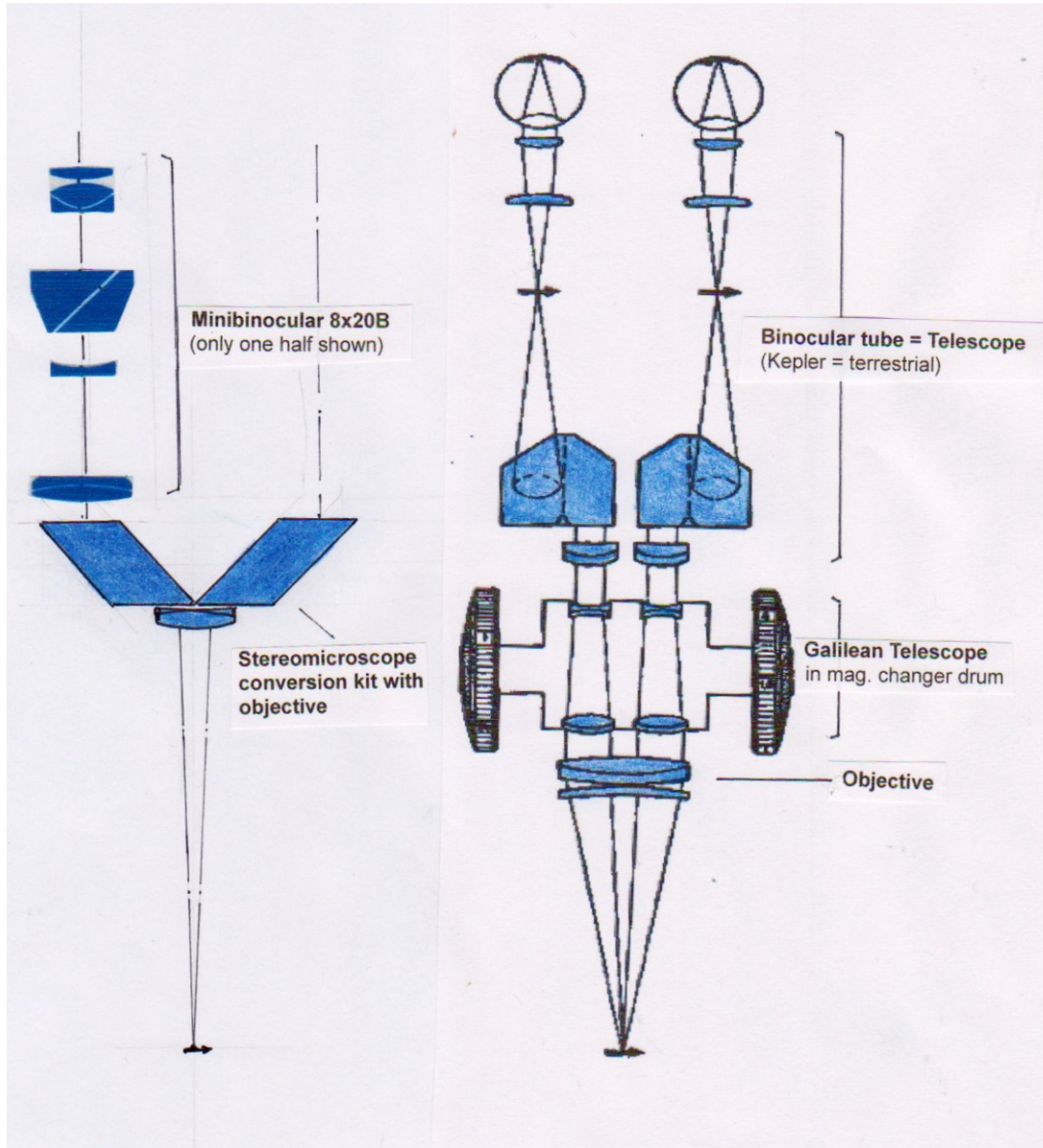


Above the cross section of a modern Zeiss 8x30 B binocular with Schmidt-Prism - notice that this incorporates a roof-edge prism (on the right, indicated by the thin black line).

For comparison, a schematic of the 8 x 20 B mini-binocular's optical system. Notice the elaborate eyepiece in both models: it is this that makes the difference between a cheap binocular and an expensive one.

The importance of a good eyepiece is also the reason why so many different eyepieces are offered for astronomical telescopes. I was once told that the bow may be more valuable than the violin. Is there a similarity?

I conclude with a comparison of the optics of both the “mini-stereomicroscope” and a regular Galilean stereomicroscope.



Juxtaposition of Minibinocular - stereomicroscope (left) and normal Galilean Stereomicroscope (right)

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