



Close up of the engravings on the new lens, here showing “prototype” and “Boston Edition”. Nice touch.

The old and new lenses, front-to-front. One sees the difference in the aperture scales – old lens stops are equidistant, new ones are not. One also sees that the “red dot” on the new lens is actually a synthetic ruby.



Two new lenses, black and chrome, together with the old 35 f/2. One can see that the lenses themselves, as well as the reflections from lens coatings, look very similar. It should be noted here that the new lenses weigh slightly over 230 grams, whereas the old Leitz lens weighs a bit over 163 grams, the difference likely due to use of more brass in the replicas.

# A NEW OLD 8-ELEMENT 35/2 SUMMICRON *from China*

by ED SCHWARTZREICH

*the* original 8-element Leitz 35 f/2 Summicron from 1958 is a classic lens, still coveted for the “Leica glow” of its images and its lack of distortion, and as a now-pricey collectible. It comes in a variety of models – for SM, for the M<sub>3</sub> with goggles, with a factory-fitted SM → M adapter, M-mount from ELC as well as ELW, and in black as well as chrome. It is a symmetrical double Gauss design, and physically quite small.

Recently, Leica aficionados on the internet have been abuzz with news and tantalizing images of and from a new version of this lens, still in prototype but nearing production. And, unlike the Thambar and 28mm Summaron reissues from Leica itself, this new / old lens is from China. Kevin-Xu (Instagram: kevinxbegin), spokesperson for those developing this lens, has kindly let LHSA test the new 35 f/2 Summicron copy; he sent us both a black and a chrome prototype, and spoke with Bill Rosauer and this reviewer about it at the recent Boston Annual Meeting. There was hardly time, however, to talk at length, and Kevin subsequently has spent much time answering questions by email about the lens’s development and manufacture. This reviewer has used one of the prototypes both for shooting in Boston and for slightly more rigorous testing at home. What follows is an interrogatory, based upon questions we asked Kevin about the lens, and then images having to do with our testing.

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**LHSA** Kevin, whose idea was the project, and what is your role in it? It is a great idea IMO, but technically difficult. Leica of course has “copied” two of its old lenses (Thambar and 28 f/5.6 Summaron), but their learning curve and production capabilities were likely far advanced compared to what you have attempted.

**KEVIN** The leader of the project is named “Mr. Zhou.” He is a Leica enthusiast and a businessman. There is a team behind him, including technicians at an optical manufacturing plant, and other Leica enthusiast friends. He has a connection with the people who work in the lens industry in China. So that’s why he thought perhaps he could work this out. It’s been two years since he started this project.

Back in July of this year, I was very excited when I first heard that someone in China was trying to make a replica 8-element. I love classic Leica lenses. I have three Summicron 35mm f2 V1 in my collection. I wanted to compare the replica with my original Leitz Summicrons. I got in touch with the people who started this project, but unfortunately, at that time, I could not get my hands on the prototype because I was not living in China right then. But Mr. Zhou very kindly shared information with me about the project and sent me some test shots taken with this lens. So, I volunteered to become his messenger to promote his project to the rest of the world. And subsequently, he is thinking I might also become a distributor to help him sell the lens overseas.

Nowadays, Leica rarely remakes their old lenses, even though they have far more technical experience to do this. But I guess they want to keep moving forward to make tremendous modern lenses. I think it's a good opportunity for the Chinese lens maker to step in to bring back those good old classic lenses to the Leica fans.

**LHSA** How did the reverse engineering proceed? How did you determine glass types, such that you could use similar formulae? Did you find glass "off the shelf" for this lens? I know from personal experience that there is at least one cemented pair of elements in the original lens which is difficult to separate (for analysis or whatever). Were there problems with such things?

**KEVIN** About the reverse engineering: they broke down the original 8-element (an early model, serial number #17XXXXX made in 1960) and sent the glass to an optical glass factory for analysis. For example, they used radiation exposure and mass spectrometry to analyze the elements that had been used in the original glass. The maker was then able to find glasses in China that matched the original ones. They then broke down two original lenses and analyzed all the coatings on each element. The maker says the original lens used two types of single coating. And so, with the results of the analysis, they were able to reproduce exactly the same coatings as the original.

Please note that leaded, or so-called flint, glass has been used in this replica. The original 8-element uses two flint-glass elements. To make this lens perform as closely as possible to the original one, flint glass will be used in the first batch. But the maker cannot guarantee the flint glass will be used in the next batch. Flint glass (leaded) is hard to find now, even in China.

**LHSA** What is the explanation for the different spacing of the f/stops between the original lens and the replica? Many older lenses (let's say, prior to 1960) used non-equidistant aperture spacing like your lens, but switched to equidistant apertures when LV coupling became common, so I am guessing that this was the simpler option for your lens.

**KEVIN** Here is the answer from Mr. Zhou: it has nothing to do with the difficulty of production. Reason one: it is related to the lens installation method. Because we have different installation methods from the original lens, the fourth and fifth element spacings are the same as the original one, but the spacing between the metal parts is different; that is, the thickness of the aperture parts is different. Reason two: It is related to the meniscus-shaped nature of the aperture blades. In order to retain the bokeh from a round shape to the aperture from f/2.0 all the way down to the smallest opening, the current replica 8-element is using meniscus-type aperture blades. The original aperture blade is a straight-edge type, so that the aperture blade movement distance will be different. The above two reasons determine whether the aperture position is equal or gradual. [N.B. close examination of the shape of the apertures of the two lenses as they closed down showed that the replica kept a rounder shape than the original; both diaphragms have 10 blades.]

**LHSA** Were construction of both the metal and glass elements done with CNC? Was there much hand-work involved?

**KEVIN** Yes, most of the metal and the lens elements are done with CNC. In the infinity-lock mechanism, there is a spring that is hand-bent, and of course, a special tool is created to bend this manually. The assembly of the lens, checking the of the rangefinder coupling, and the final factory inspection require the operation of a technician.

**LHSA** Are MTF curves available for your lens, or will there be such?

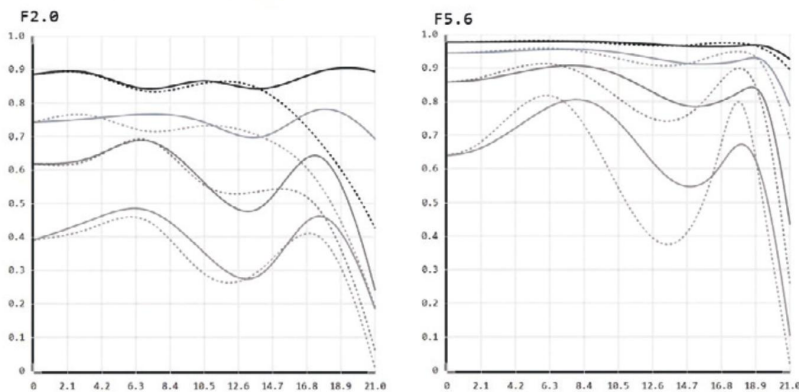
**KEVIN** I have attached two pictures of the MTF data. One is at f/5.6, and one is at f/2.0.

**LHSA** I have Leica's MTF curves published for the original lens, but I wonder whether you have access to MTF curves for the old lens that were done on the same equipment that did the ones for your new lens. It can be difficult to compare curves done at different times on different equipment. In this case, the Leica curves and Mr. Zhou's curves look slightly different.

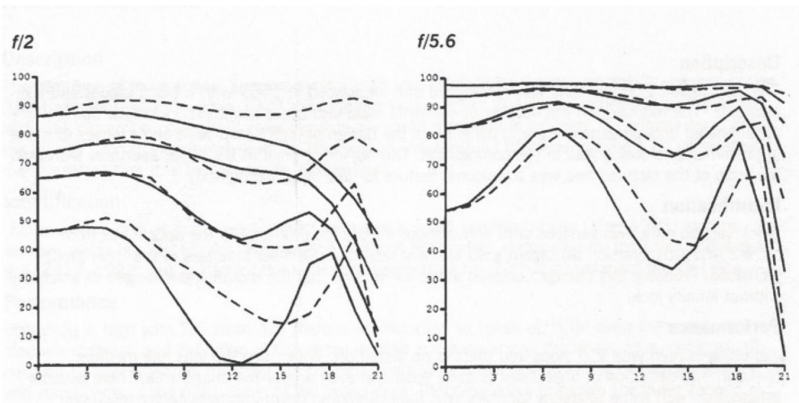
**KEVIN** We did also test both lenses on the same piece of equipment, and the replica is slightly better than the original, especially the degree of coincidence and the control of dispersion. The machine we used for this test however was simply used to compare lenses and not specifically for accuracy, and because of this, we do not think these results should be published at this time.

**LHSA** Did you think there might be legal issues copying the 8-element Summicron, and how was this addressed? Have you heard from Leica about this?





TOP

(LEFT) MTF curves for new lens at  $f/2.0$ (RIGHT) MTF curves for new lens at  $f/5.6$ 

BOTTOM

(LEFT) MTF curves for the old lens at  $f/2.0$ (RIGHT) MTF curves for old lens at  $f/5.6$ 

**KEVIN** The maker believes that all the Leica patents are expired. He had done research and asked a lawyer before he started the project. So, I think it's ok to make the replica right now.

**LHSA** Cannot think right now of more to ask, Kevin. Thank you so much for these very interesting answers. And further, we at LHSA thank you for the opportunity to evaluate your lenses.

A search will find images taken with this replica lens, at times side-by-side with some from the original model, currently available on the internet. LHSA did its own testing, using an M10.

Two grab-shot images taken with the new lens from the Boston Annual Meeting are shown first. One is an instructive B&W conversion @  $f/2$ , shooting into open electric lights surrounding fellow LHSA'ers at dinner in a restaurant. There is blooming around the bulbs themselves and related loss of contrast on the nearest person's hair and forehead, but not objectionable flare or spurious reflections away from the bulbs; what is depicted is natural looking and conveys the mood of the occasion well. Few more modern lenses could circumvent such an issue completely. Sharpness is reasonable, as otherwise is contrast. The second image is a street shot,

about  $1/3$  of the actual image,  $f/5.6$ . It shows good sharpness and nice color rendition.

A note about handling: tactilely and ergonomically, the replica lens performed identically to the original lens, with the minor exception of the differing aperture rings. The lenses were like identical twins, albeit twins separated by 60 years.

For more specific testing, there is a pair of images with about  $1/4$  of the disc of the sun in the center of each, at  $f/4.5$ , which show little flare in either the old or the new lens. Slightly different metering / exposure likely explains why the underside of the roof has more detail for the new lens here.

Following this is a pair of images at a similar aperture showing specular highlights on a truck, again with little difference between the lenses and good behavior all around. Kevin has recently written that Mr. Zhou has further perfected the flare performance of the new lens, so that it is even better than the original.

Two tripod shots wide open of Christmas-type lights looking for coma are next; only the lights near the edge of the frame are shown. It must be said that neither lens is stellar here, but both seem about equal. The 35  $f/2$  Summicron V1 has been noted historically to have "a healthy amount" of coma at  $f/2$ , gone by  $f/8$ .

Vignetting was tested for at  $f/2.0$ ; both old and new lenses looked approximately the same, so one felt no need to show this. In Hove's Leica Pocket Book, 7th Edition, 1984, Erwin Puts writes about the 35  $f/2$  V1: "Vignetting is high with 2.6 stops...The high vignetting was said to improve corner performance". Over 2 stops of vignetting was consistent with what was observed with both lenses.


In a simple examination of possible curvature of field with both lenses at  $f/2.0$  focused at a target at  $\infty$ , the lenses behaved quite similarly with more nearby objects near the edges of the frame.

Two other possible issues: 1. pincushion or barrel distortion is said to be non-existent with the original lens, and was not tested for with either. 2. Potential focus shift on stopping down was another variable not specifically investigated in the comparison between the lenses, but there seemed informally to be little evidence of such.

Bokeh: To go out on a limb somewhat, bokeh as a concept was not even likely thought of at the time the original lens was fabricated. Leitz's goal was reportage, and state of the art performance by balancing or eliminating residual aberrations. And this reviewer has read differing thoughts about the bokeh of this particular lens; the received opinion is that it is not a "bokeh king". Performing a rough comparison of OOF areas between the original and the replica at  $f/2.0$  and  $f/4.0$  reveal only very minor differences: perhaps the new lens is slightly less harsh in its bokeh due to the new construction of the diaphragm blades, but mostly the two are very similar.

Finally, we have the series of pictures of a still life at different apertures. The reviewer's M10 was mounted on a tripod and images of a curio cabinet were made at click-stopped apertures from  $f/2.0$  to  $f/5.6$  in series, one lens after the other using a cable release. Cropped sections near the center and at the corner were made for comparison. Only the  $f/2.0$  and  $f/5.6$  shots are being shown here, for simplicity. One should be aware that the reviewer's original lens is 60 years old, #165\*\*\*\*, quite early, and has also been professionally worked on to remove fungus. Also, one should appreciate that the new lenses are prototypes, not part of a final production run. Nonetheless, all differences would appear to be due to minute variations in focus (which was done by rangefinder), rather than any major discrepancies. Both lenses seem similar.

The reviewer's informal opinion: the new lens is a decided success. Mr. Zhou plans next to replicate the rare 50/1.2 Noctilux, with its two aspherical surfaces.

Prices for this lens will start at \$500 depending on tariff and customs. 



Two shots taken at the Boston LHSa meeting with the new lens. (TOP) Low light at  $f/2.0$  in a restaurant. (BOTTOM) Street scene, about 1/3 of the original image, likely  $f/5.6$ .



(TOP: Old Lens, BOTTOM: New Lens)  
Two images of Christmas-type lights at the edge of the frame at  $f/2.0$ , to look at coma; edge is to the left as viewed. Both lenses are similar, and not that good. Past reviewers of the original lens have commented on the "healthy amount" of coma at  $f/2$  (but gone by  $f/8$ ), so the current findings are not really surprising.





New Lens

Old Lens

(ABOVE) Two sets of shots looking at flare. In one set 1/4 of the sun's disc is in the middle of the frame. In the other, there are specular highlights on the truck.  
(BELOW) The lens tests proper, first showing the curio cabinet used as a target, then each lens at f/2.0 and f/5.6 – both center and corner.







*New Lens, f/2, Corner*



*Old Lens, f/2, Corner*



*New Lens, f/5.6, Corner*



*Old Lens, f/5.6, Corner*



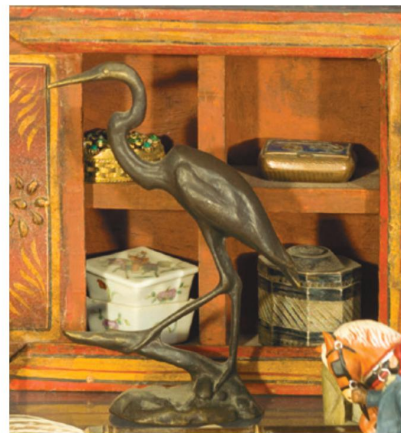
*New Lens, f/2, Center*



*Old Lens, f/2, Center*



*New Lens, f/5.6 Center*



*Old Lens, f/5.6, Center*