From S to PS lenses

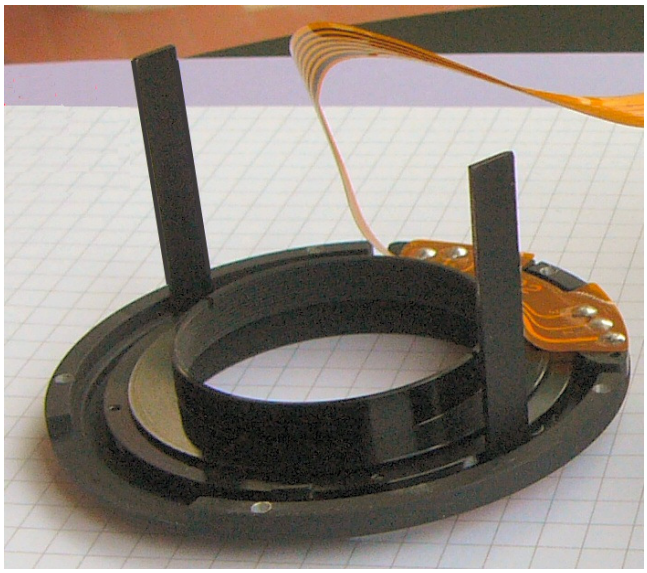
By M.Vettore

Zenza Bronica SQ camera was introduced in October, 1980 and with it the S lenses family.
The company moved the production to a new factory in 1983 introducing a new camera the GS-1 with the PG lenses family. The new factory was equipped with the newest and most modern lens testing and assembly equipments available at the time in the world. The PG lenses design was complete new addressing the pitfalls found in the S and ETR E and MC lenses. As consequence the S lenses family was complete redesigned and the new family PS was introduced in 1986.
The redesign or better the new design addressed several points of the lenses:
Optics – Multicoated lenses in different groups, elements.
Mechanics – Half stop detents, back and front assemblies. The redesign of the system transmitting the cocking stroke from camera to the shutter, takes care of the "Sloppy Lens Syndrome" (see my article "Bring a sloppy Zenzanon lens back to life" at www.buonaluce.com).
Esthetics – The redesign of the front assembly eliminated the barrel side screws.
Lens specific problems – Light leakages in some lenses; vignetting in S50/3.5 lens addressed upsizing the filter size from 67 to 77mm.

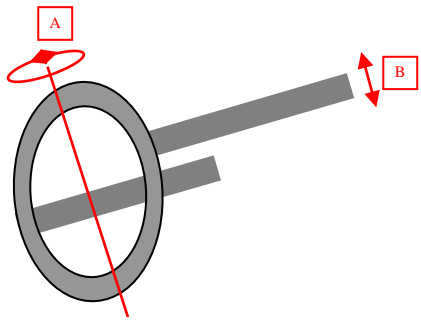
Lens	Groups/ Elements	Apertures	Min Focus m/ft	Filter size mm.	Overall mm.	Weight grams	Equivalence 35mm
S40/4	8-11	4-22	0.4/1.3	82	65	620	23
S50/3.5	8-10	3.5-22	0.5/1.6	67	62	560	28
S80/2.8	4-6	2.8-22	0.8/2.6	67	52	470	45
S105/3.5	4-6	3.5-22	0.85/2.8	67	60	550	58
S150/3.5	5-5	3.5-22	1.5/4.9	67	61	590	85
S200/4.5	5-5	4.5-32	2/6.5	67	98	685	105
S250/5.6	5-5	5.6-32	3/9.8	67	129	815	135
S500/8	6-7	8-45	8.5/28	95	262	1850	280
PS35/3.5	8-11	3.5-22	0,28/13"	32,5	91	960	19
PS40/4	8-11	4-22	0.4/1.3	95	68	650	23
PS50/3.5	8-10	3.5-22	0.5/1.6	77	62	530	28
PS65/4	7-9	4-22	0.5/1.9	67	70	665	35
PS80/2.8	5-6	2.8-22	0.8/2.6	67	52	490	45
PS110/4 Macro 1:4	4-6	4-32	0.6/2.1	67	79	685	60
PS110/4.5 Macro 1:1	8-9	4.5-32	0.37/14.5"	67	85	940	60
PS135/4	4-6	4-32	1/3.2	67	79	755	76
PS150/4	4-6	4-32	1.5/4.9	67	74	750	85
PS180/4.5	8-9	4.5-32	1/3.2	67	96	865	100
PS200/4.5	5-7	4.5-32	2.5/8	67	107	800	110
PS250/5.6	5-7	5.6-45	3/9.8	67	150	1010	135
PS500/8	10-11	8-64	8/25.6	122	308	3760	270
PS50-100/4.5-5.6	10-12	4.5/5.6-32	1.5/4.9	95	103	1010	28-54

Brief analysis of a lens redesign: the 150mm

Rear part – The cocking stroke transmitting mechanism of S class lenses was made by an aluminum sheet disk with two bended wings: the levers engage the shutter (Pic. 1). The aluminum disk runs on a ball bearing. Time and use wear out the system, causing rolling and pitching of the disk (A), and loss of the levers rigidity (B), the shutter doesn't reach its cocking position every time (Pic. 2).

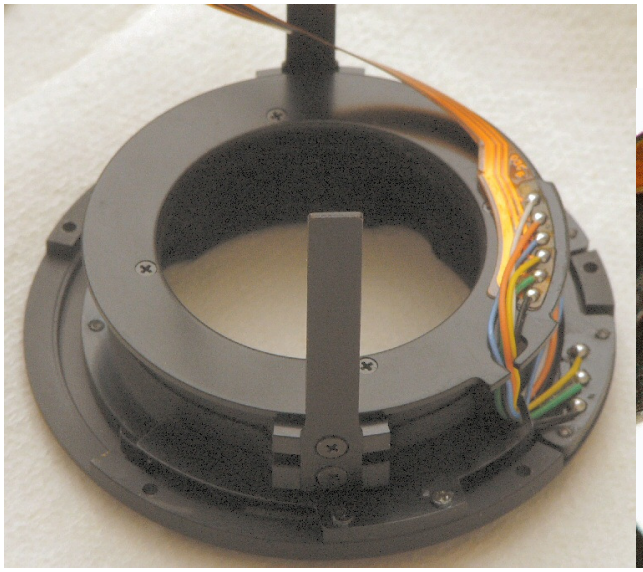


Pic. 1



Pic. 2

On the PS class lenses the mechanism got complete redesigned: the levers are independent parts double fixed with screws to a cylinder running on two ball bearings (PIC. 3). The result is a more rigid structure less prone to wearing out.
Furthermore to avoid light leaks, the cylinder tunnel was inside coated with a light absorber material and its depth was sized to envelope the rear glass of the back optical assembly even at its maximum distance from the camera (PIC. 4).



Pic. 3

Pic. 4

Optics – The optical schema has changed: from 5 elements in 5 groups in the S lens, to 6 elements in 4 groups in the PS lens. Max aperture was reduced from 3.5 of S lens to 4 of PS as consequence the front glass was reduced in diameter. The PS lens glasses is multicoated the S not. Due to the new schema the optical assemblies were reduced from 3 of S lens (2 frontals, 1 rear) to 2 of PS lens.

Shutter – It remains almost the same, main difference is the former has 7 detects the newest 13 to include half stops.

Front part – Like the rear part the front part was complete redesign: in the S lens it was a very simple assembly composed by rings framed together and fixed with 3 side screws. The assembly is relative easy to dismount: remove the screws and unblock the rings. Instead the PS is more complex; it has a set of flanged rings keep together with screws; to unassembly is necessary to remove 25 screws and extract a framed ring. Why the designers changed the structure from a simple one to a more complex? The answer could be the PS structure is far more solid and looks more pro.

Conclusion

Even if in every discussion I've found on the final result taking photos with S and PS lenses emerges nobody sees relevant differences; is out of discussion the PS lenses have been designed and built better than the S lenses and to work flawless much more than the original S lenses.