

THE NEW SWAROVSKI 7X21 CURIO AND OTHER COMPACT BINOCULARS

October 2021
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INTRODUCTION.

In 2021 Swarovski introduced a new compact binocular: the Swarovski Curio 7x21. Considering the limitations brought about by the Covid pandemic that seems quite an achievement. In recent years binoculars with a magnification of 7x have become less popular as shown by their lower sales figures. Some companies even stopped the production of their 7x program. In this report I present our research data with regard to the optical performance and user comfort of the Swarovski Curio and of some other compacts made by different companies: new and historic ones.

Short overview of the history of modern compact binoculars.

In binocular history quite a few compact binoculars can be found made by different companies, but the number made were not overwhelming. However, compacts became really popular when Zeiss introduced in 1969-1970 its 8x20 and 6x20 “Kleinfeldstecher”. Both binoculars were ultracompact, as the photographs in Figure 8 show. In the early seventies the Leitz design team also developed a number of prototypes of a new compact binocular. The prototypes were presented to the Leitz management who dismissed them with the words “*we are not going to produce toys*”. In the end the management gave in and around 1974 mass production started. Other companies like Minolta, Nikon, Olympus, Swarovski etc. also followed.

This report is mainly dedicated to the investigation of the optical properties and performance of the new Swarovski 7x21 Curio in comparison with compacts made by Asahi Pentax, Leitz-Leica, Minolta, Nikon, Olympus and Zeiss and from the last one especially the Zeiss Victory 8x25. The presented photographs are meant to give the readers of this report an impression of the size and appearance of the Curio in comparison with the other investigated compacts. I am aware that certainly not all compacts that are made in the past century are presented, but perhaps it stimulates initiatives by the readers of this report.



Fig 1. Swarovski Curio 7x21 and its accessories in the box as it is delivered by Swarovski.



Fig 2. From left to right: Swarovski CL Pocket 8x25B (sand), Swarovski Curio 7x21 (orange, also available in black), Swarovski 8x20 (green).



Fig. 3. Asahi Pentax compacts and the Swarovski Curio 7x21. From left to right: Asahi Pentax 7x20, Asahi Pentax 9x20, Swarovski Curio 7x21, Asahi Pentax 7x21, Asahi Pentax Papilio II 6,5x21



Fig. 4. Leitz/Leica and the Swarovski Curio 7x21. From left to right: Leitz Trinovid 8x20C, Leica Trinovid Titanium 8x20 BC, Swarovski Curio 7x21, Leica Ultravid 8x20, two Leica Ultravid 8x20 monoculars with different colored body armor.



Fig 5. Different compacts made in Japan and the Swarovski Curio. From left to right: Minolta 6x16, Minolta 8x23, Swarovski Curio 7x21, Minolta 8x24, Beck Kassel Kobold 7x20 (made in Germany)



Fig. 6. From left to right: Nikon Sprint II 7x21, Swarovski Curio 7x21, Nikon 5x15



Fig 7. From left to right: Olympus 7x21 PC III, Swarovski Curio 7x21, Minox 8x25



Fig. 8. Zeiss compacts and the Swarovski Curio. From left to right: Zeiss monocular 8x20, Zeiss Kleinfeldstecher 8x20, Zeiss Kleinfeldstecher 8x20B, Swarovski Curio 7x21, Zeiss Design Selection 8x20 B, Zeiss 8x20B with central focusing, Zeiss 8x20B with extractable eyecups (the “mother” of the later produced 8x25 Victory).



Fig 9. From left to right: Asahi Pentax 7x20 monocular, Carl Zeiss Jena DDR 8x18 (a really bad binocular), Swarovski Curio 7x21, Möller Tourox 7x28



Fig. 10. Left: Swarovski Curio 7x21, right: transparent porro 7x18, sold in South African national parks for tourists without binoculars.



Fig. 11. From left to right: Asahi Pentax 4x20, Swarovski Curio 7x21 and Asahi Pentax monocular 6x21WP. All three were in 2021 new on the market.

The Asahi Pentax 4x20 binocular (left in figure 11) is a special instrument. One can uncouple the two monoculars and clip them together into a monocular telescope (Fig. 12). FOV drops from 175 m/1000 m for the binocular to 40m/1000m for the telescope. The telescope has a magnification of 17x. The Asahi Pentax 6x21 is a multi-functional instrument. It can be used as a monocular telescope that is focused by squeezing the handle on top of the telescope body. Moreover, it is supplied with an adapter to use the instrument as a microscope. With another adapter it can be coupled to the camera of a mobile phone to function as a telephoto lens.



Fig 12. Left: Two halves of the Asahi Pentax 4x20 binocular coupled to form a 17x20 monocular telescope. Right: The Asahi Pentax 6x21 roof prism monocular converted into a microscope with built-in illumination (LED lights).

RESULTS.

In the added tables and photographs all our measured data are shown and I therefore will not elaborate further on the description and performance of these binoculars.

THE SWAROVSKI CURIO 7X21

I can be very short: With the Curio 7x21 Swarovski has presented an excellent compact binocular as you can also see from the data in the tables and transmission spectra: very good optical performance and excellent handling properties. It is a tiny bit larger than the Leica and Zeiss 8x20 compacts and that is in favor of its handling. With 135m/1000m its field of view is among the highest of the compacts investigated here, see the tables. Color reproduction is for my eyes perfect as it is also supported by the flat shape of the measured transmission spectrum. Image brightness is very high due to a transmission of 93% over a broad spectral range.

Do I have nothing to wish for? Yes, the Curio with the supplied rain cap and strap does not hang flat on the body and I find that unpleasant. Fortunately, Swarovski also makes a nice rain cap and strap for its CL8x25 and that is very well suited for application on the Curio 7x21: problem solved. The Curio is made in orange-white and in black and is worth every penny of your investment unless you want a smaller close focus distance than 2,5 m.

THE ZEISS VICTORY 8X25 (see Figure 13 below)

This binocular is a slightly enlarged version of the original Zeiss 8x20 B: exactly the same body design with its asymmetric binocular bridge, which is elegant and has a high level of user comfort. It seems that it was for Zeiss not so difficult to enlarge the original design of the 8x20B (see figure 8) into an 8x25 with exactly the same design. And that may have been a reason (low design costs?) also to have the Victory 8x25 made in Japan and not in Germany, but that is my speculation.

Optically it is a very attractive binocular, see also the data in the added tables and the transmission spectra. Because of its body design user comfort is especially high for right-handed users, left-handed users,

however, are confronted with a lower level of user comfort due to the asymmetric bridge construction, see also the identically constructed Zeiss 8x20 in Figure 8. The Zeiss Victory 8x25 is vulnerable with regard to the construction of the diopter compensation as mentioned by dealers who receive them frequently for repair because of a broken of the axis of the diopter wheel.



Fig. 13 Left: Swarovski Curio 7x21, right: Zeiss Victory 8x25

OTHER COMPACTS

With regard to the performance of the other investigated compacts, see our data in the different tables and the measured transmission spectra, so the reader him/herself can make their own conclusions. After all the readers of this report also have to do some homework.

ACKNOWLEDGMENTS

I am grateful to Swarovski Optic in Austria to make the Curio 7x21 available for our investigation. The same holds for Jan van Daalen from House of Outdoor & Optics for supplying us with the Zeiss Victory 8x25 for this investigation. We also are grateful to a number of binocular collectors who supplied us very generously with a range of different compacts for this investigation. Ing. Dave van den Heuvel has again delivered an excellent job by his support and measurement of all the presented transmission spectra for which I am very grateful.

TABLE 1: INSTRUMENT DATA OF COMPACT SWAROVSKI BINOCULARS.

BINOCULAR	SWAROVSKI 8X20 B Habicht (also Pocket 8x20B and/ or Traveller 8x20B)	SWAROVSKI CL 8X25 (also known as CL Pocket 8x25B)	ZEISS VICTORY 8X25 (Made in Japan)	SWAROVSKI CURIO 7X21 introduced in 2021
Weight	217 g	360 g	290 g	255 g
Prism type	Schmidt-Pechan roof	Schmidt-Pechan roof	Schmidt-Pechan roof	Schmidt-Pechan roof
Objective diameter O	20,0 mm	24,6 mm	25 mm	21,1 mm
Diameter exit pupil P	2,6 mm	3,1 mm	3,2 mm	3,05mm
Magnification M=O/P	7,7x	7,9x	7,8x	6,9x
Eye relief (mm)	13 mm	17 mm	19 mm	16 mm
Field of view (m/1000m)	115m/1000m	119m/100m	130m/1000m	135m/1000m
Close focus (m)	2,5 m	2,2 m	1,9 m	2,5 m
Eye distance between both tubes	30-74 mm	33-74 mm	34-72 mm	33-74 mm
Revolutions close focus to infinity	1,25.	2	1,75	2,2
Transmission 500 nm 550 nm	93,2% 94,3%	91,2% 91,2%	93,2% 93,9%	93,2% 93,9%
Color reproduction		Perfect	Perfect	Perfect
Diopter compensation	+/- 5 dpt	+/- 4 dpt.	+/- 4 dpt.	+/- 4 dpt.
Phase coating	Yes	Yes	Yes	Yes
Authors judgment	+++++	+++++	+++++ Good optical quality, user comfort good for right-handed users, not for left handed ones. Diopter construction vulnerable	+++++ Excellent binocular both with regard to handling as well as optically
Price (euro)	590 euro	790 euro	795 euro	770 euro

TABLE 2: INSTRUMENT DATA OF COMPACT BINOCULARS: SWAROVSKI CURIO 7X21 AND DIFFERENT ASAHI PENTAX COMPACTS

BINOCULAR	ASAHI PENTAX 7X20	ASAHI PENTAX 9X20	ASAHI PENTAX 7X21	ASAHI PENTAX PAPILIO 2 6,5X21	SWAROVSKI CURIO 7X21 (2021)
Weight	185 g	191 g	207 g	294 g	255 g
Prism type	SCHMIDT-PECHAN ROOF	SCHMIDT-PECHAN ROOF	PORRO	PORRO	SCHMIDT-PECHAN ROOF
Objective diameter O	19,4 mm	19,1 mm	21,2 mm	20 mm	21,1 mm
Diameter exit pupil P	3 mm	2,1 mm	3 mm	3,1 mm	3,05 mm
Magnification M=O/P	7,1x	9,1x	7,1x	6,45 x	6,9x
Eye relief (mm)	12 mm	9 mm	12 mm	15 mm	16 mm
Field of view (m/1000m)	131m/1000m	108m/1000m	140m/1000m	131m/1000m	135m/1000m
Close focus (m)	2,4 m	3 m	2,75 m	45 cm	2,5 m
Eye distance between both tubes	26-71 mm	58-70 mm	57-71 mm	55-73 mm	33-75 mm
Revolutions close focus to infinity	1,75 rev.	1,5 rev.	2	3 rev.	2,2 rev.
Transmission 500 nm	53%	57,4%	61,5%	81,7%	93,2%
550 nm	56,1%	61,1%	64,9%	86,5%	93,9%
Color reproduction	Good	Warm due too tiny emphasis on red	Good	Good, warm	Perfect
Diopter compensation	+/- 3 dpt	+/- 4 dpt	+/- 2 dpt.	+/- 4 dpt.	+/- 3 dpt.
Phase coating	No	No	Not necessary	Not necessary	Yes
Authors judgment	Nice compact binocular. Can not compete with modern new binoculars	Very compact binocular. Can not compete with new modern binoculars.	Very compact binocular with similar construction as the Papilio	Very short close focus distance good for observation of small objects like insects.	+++++ Excellent binocular both with regard to handling as well as optically
Price (euro)					770 euro

TABLE 3. SWAROVSKI CURIO 7X21 AND LEICA COMPACTS

BINOCULAR	LEITZ TRINOVID COMPACT 8X20C (1978)	LEICA TRINOVID COMPACT 8X20 BC (1998)	LEICA ULTRAVID 8X20 (2004)	SWAROVSKI CURIO 7X21 (2021)
Weight	180 g	228 g	243 g	255 g
Prism type	Uppendahl roof	Uppendahl roof	Uppendahl roof	Schmidt-Pechan roof
Objective diameter O	20,9 mm	19,95 mm	20,0 mm	21,1 mm
Diameter exit pupil P	2,45 mm	2,65 mm	2,6 mm	3,05 mm
Magnification M=O/P	8,5x	7,5x	7,7x	6,9x
Eye relief (mm)	8 mm	17 mm	16 mm	16 mm
Field of view (m/1000m)	120m	115 m	110m	135m/1000m
Close focus (m)	2m	2,6 m	1,6m	2,5 m
Eye distance between both tubes	32-80 mm	32-80 mm	36-74 mm	33-75 mm
Revolutions close focus to infinity	3,7	2	2	2,2
Transmission 500 nm 550 nm	54% 56%	85% 86%	92% 94%	93,2% 93,9%
Color reproduction	good	Good	Very good	Very good
Diopter compensation	+/- 3,5 dpt	+/- 3,5 dpt	+/- 3,5 dpt	+/- 4 dpt
Phase coating	No	Yes	Yes	Yes
Authors judgment	+	++++	+++++ Beautiful binocular with very good optical performance	+++++ Excellent binocular both with regard to handling as well as optically
Price (euro)	25-75 euro	100-200 euro	500 euro	770 euro

TABLE 4. THE NEW SWAROVSKI CURIO 7X21 AND COMPACTS FROM MINOX, NIKON AND OLYMPUS

BINOCULAR	NIKON SPRINT 11 7x21	NIKON 5X15	OLYMPUS 7X21 PC 111	MINOX 8X25	SWAROVSKI CURIO 7X21 (2021)
Weight	225 g	205 g	187 g	305 g	255 g
Prism type	Porro	Schmidt-Pechan roof	Porro	Schmidt-Pechan roof	Schmidt-Pechan roof
Objective diameter O	20,3 mm	14,8 mm	20,0 mm	24,6 mm	21,1 mm
Diameter exit pupil P	2,9 mm	3,9 mm	2,8 mm	3 mm	3,05 mm
Magnification M=O/P	7x	4x	7,1x	8,2x	6,9x
Eye relief (mm)	10 mm	15 mm	8 mm	15 mm	17 mm
Field of view (m/1000m)	117m/1000m	157m/1000m	131m/1000m	110 m/1000m	135m/1000m
Close focus (m)	2,45 m	0,85 m	2,65 m	2 m	2,5 m
Eye distance between both tubes	51-72 mm	54-72 mm	58-70 mm	58-72 mm	33-75 mm
Revolutions close focus to infinity	0,75	1,1	1,5	1	2,2
Transmission 500 nm 550 nm	82,4% 85,1%	69,9% 76,3%	80,4% 83,8%	73,6% 74,3%	93,2% 93,9%
Color reproduction	Good, slight red preference	Good, slight red preference	Good	Good	Perfect
Diopter compensation	+/- 5 dpt	+/- 4 dpt.	+/- 3 dpt ?	+/- 3 dpt.?	+/- 4 dpt
Phase coating	Not necessary	No	Not necessary	Yes	Yes
Authors judgment	Compact binocular with reasonable performance. Ageing armor becomes sticky.	Very compact, easy handling and acceptable optical performance	Compact binocular with good optical performance	Compact binocular with reasonable performance for its price.	+++++ Excellent binocular both with regard to handling as well as optically
Price (euro)					770 euro

TABLE 5

BINOCULAR	MINOLTA 6X16	MINOLTA 8X23	BECK KOBOLD 7x20	SWAROVSKI CURIO 7X21 (2021)
Weighte	119 g	251 g	265 g	255 g
Prism type	Schmidt- Pechan roof	Schmidt- Pechan roof	Porro	Schmidt-Pechan roof
Objective diameter O	Not measured, Rectangle	22,3 mm	19,4 mm	21,1 mm
Diameter exit pupil P	Not measured, Rectangle	2,7 mm	2,7 mm	3,05 mm
Magnification M=O/P	6x	8,3x	7,2x	6,9x
Eye relief (mm)	11 mm	11 mm	5 mm	17 mm
Field of view (m/1000m)	159m/1000m	122m/1000m	?	135m/1000m
Close focus (m)	75 cm	3,9 m	2,7 m	2,5 m
Eye distance between both tubes	50-70 mm	55-74 mm	59-79 mm	33-75 mm
Revolutions close focus to infinity	0,7 .	0,75	Individual focus 0,75 rev.	2,2
Transmission 500 nm 550 nm	50,7% 53,4%	70,3% 74,3%	Not measured	93,2% 93,9%
Color reproduction	ok	ok	OK, red preference	Perfect
Diopter compensation	+/- 2 dpt?	+/- 3 dpt?	+/- 6 dpt.	+/- 4 dpt.
Phase coating	No	Not necessary	Not necessary	Yes
Authors judgment	Very compact, user comfort is a nightmare.	Compact, with acceptable optical performance	Special well-built binocular with good optical performance for its age	+++++ Excellent binocular both with regard to handling as well as optically
Price (euro)				770 euro

TABLE 6

BINOCULAR	ZEISS 8X20 (1972)	ZEISS DESIGN SELECTION 8X20 (1990)	ZEISS 8X20 BT* (1992?)	UNKNOWN 7X18 SOUTH AFRICA	SWAROVSKI CURIO 7X21 (2021)
Weight	123 g	180 g	225 g	132 g	255 g
Prism type	Schmidt-Pechan roof	Schmidt-Pechan roof	Schmidt-Pechan roof	Porro	Schmidt-Pechan roof
Objective diameter O	19,9 mm	20 mm	19,85 mm	17,2 mm	21,1 mm
Diameter exit pupil P	2,6 mm	2,5 mm	2,5 mm	2,1 mm	3,05 mm
Magnification M=O/P	7,7x	8x	7,9x	8,2x	6,9x
Eye relief (mm)	4 mm	7 mm	15 mm	4 mm	17 mm
Field of view (m/1000m)	120m/1000m	110m/1000m	110m/1000m	70m/1000m	135m/1000m
Close focus (m)	2,5 m	3,2 m	2,13 m	4,5 m	2,5 m
Eye distance between both tubes	35-72 mm	40-72 mm	32-72 mm	59-71 mm	33-75 mm
Revolutions close focus to infinity	1,1	1	1,2	1	2,2
Transmission 500 nm 550 nm	82,4% 86,5%	87,2% 89,9%	87,2% 89,9%	45,9% 44,2%	93,2% 93,9%
Color reproduction	Good	Good	Good	0k	Perfect
Diopter compensation		+/- 3 dpt.	+/- 4 dpt.	0 dpt.	
Phase coating	No	Yes	Yes	Not necessary	Yes
Authors judgment	++	+++	+++++ Good handling comfort for right-handed users and good optical performance	-- Works if no binocular is available	+++++ Excellent binocular both with regard to handling as well as optically
Price (euro)					770 euro















