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# Building and Using Binoscopes

Norman Butler

Second Edition

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# Preface

As an amateur astronomer living in Topeka, Kansas, in the 1970s, on clear nights, away from the city, one could easily see our spectacular Milky Way galaxy arching across the beautiful night sky. Seeing this wonderful sight night after night through my trusty telescope really got me thinking about how spectacular these wonderful celestial objects would look through a large binocular telescope. To realize my dream, in the late 1970s, I started on my quest to build my first large binocular telescope. By November of 1980, I had completed a dual 6 in. f/15 Cassegrain Dall-Kirkham binocular telescope (10 mirrors) on a clock-driven equatorial mount complete with a 360° steel ring OTA rotation system.

In terms of this book, this is not a "How To" book. It's a book that is designed to give the interested readers, amateur astronomers and amateur telescope builders (experienced or otherwise) ideas, suggestions and important information about "building" and "using" a refractor binoscope or binocular telescope. If you can already build and use a telescope and/or interested in doing so, then after you read this book, you should be able to take some of the more interesting and clever ideas that are presented in the following 10 chapters and incorporate them into building and using your own telescope, binoscope or binocular telescope someday. A binoscope and a binocular telescope are one and the same. They both do basically the same thing, which is allowing the observer to view celestial objects with two telescopes, using both eyes. In this book, I wanted to show as many photos as possible different kinds of homemade (some commercial) refractor and reflector binoscopes, binocular telescopes, and standard Dobsonian and Cassegrain telescopes to demonstrate how resourceful and creative today's amateur telescope makers really are. The homemade binoscopes pictured in this book should provide the interested reader with some good ideas on building their own binoscope someday.

It does not take a whole lot of imagination to understand the simple optics and mechanics behind building a binoscope or a large binocular telescope. What it does take is a little more expense for the cost of optics (times 2) and twice as much materials, time, and ambition to build, for example, a Dobsonian-style binocular telescope or binoscope compared to constructing a single telescope. Beyond that, once you have made the commitment to start your binoscope project by creating a robust design and doing all the advance planning and homework, then you should really look forward to your project. And after your binoscope project is finally completed, and you get your first views through it, then that's when the fun begins. Welcome to the binoscope club!

Please note: All of the author's own proceeds from the sale of this new Springer second edition book *Building and Using Binoscopes* and the first edition of the same book goes to help fund a junior college astronomy scholarship fund.

Northern Marianas Islands, USA Norman Butler
June 2016

# Acknowledgments

I wanted to take this opportunity to acknowledge some individuals who encouraged me along the way to make this literary endeavor about binoscopes into a successful reality. I wish to extend my sincere thanks and deep appreciation to John Bauer, my late, great, dear friend, mentor, and astronomy professor during my early college years at San Diego City College. Without his inspiration, support, and guidance, I would have probably never made it this far in astronomy, especially as a career, and worked at the observatory level in Hawaii. Likewise, I wish to thank astronomers Fred Pilcher, Richard Wilds, Rick Schmidt, and Ray Lewis. All four of them, who in my distant past, encouraged me at some point to pursue some of my lofty goals in astronomy. Likewise, I wish to thank those individuals who contributed important images, information, website stories and illustrations for inclusion in my new book. And finally, I thank my dear mother Gladys and my brother Mike who were both always my main source of encouragement for all of my astronomy endeavors, no matter how outrageous they were.

# Contents

# About the Author

**Norman Butler** is a noted, award-winning telescope maker who has made some very unique, one-of-a-kind binocular telescopes. He has also worked in the field of astronomy and electro-optical engineering for AVCO Everett Research Laboratory at the Haleakala Observatory on the island of Maui starting in the early 1980s, building electro-optical equipment for use on both 1.6 M and dual 1.2 M telescopes. A graduate of San Diego City College, Norman holds advanced degrees in physics and astronomy including a Ph.D. He also served in the US Navy as an opticalman on submarine tenders repairing submarine periscopes and optical navigational equipment throughout the entire 1960s. After a 20-year career in electro-optical engineering, starting in 1994, Norman relocated to Hong Kong and started working in nearby Shenzhen, China as a joint-venture manager in the electronics industry. In 2004, he became a permanent resident of Hong Kong and started teaching at Shenzhen Polytechnic College and Harbin Institute of Technology Shenzhen Graduate School in nearby Shenzhen, China. Norman retired in 2012 and now lives in the Northern Marianas Islands and enjoys searching for comets as well as other strange and mysterious cosmic interlopers under the beautiful dark tropical skies of Saipan and Guam.