

by Terence Dickinson

# Pentax XW premium eyepieces

*Eyepieces are your telescope's most important accessories. Experienced backyard astronomers usually own three to five eyepieces to be ready to observe the full range of astronomical subjects. Since most new telescopes come with only one or two eyepieces as standard equipment, the purchase of additional ones can quickly become a fairly high priority.*

AFTER "WHAT TELESCOPE SHOULD I BUY?" the question I am most often asked is, "What eyepieces should I buy?" Two generations ago, when I started out in astronomy, there were three types of eyepieces commonly in use: the standard-priced Kellner, the premium-priced Orthoscopic and the low-power, wide-angle Erfle. Today, all three are considered inferior to more modern eyepiece designs, either because of narrow fields of view (Kellners and Orthos) or objectionable optical aberrations (Kellners and Erfles).

In the 1980s, Plössl eyepieces became the premium design. You can still buy them, and if you are looking for economy eyepieces for under \$100, I can recommend them as a best buy no matter which brand name is on them. But here in the world of 21st-century astronomy, in the premium price categories (\$300 plus), there have been some astounding developments in the eyepieces now available.

One of the most impressive is the new Pentax XW eyepiece line in 40mm and 30mm focal lengths for 2-inch eyepiece focusers and 20mm, 14mm, 10mm, 7mm, 5mm and 3.5mm for standard 1.25-inch focusers. For more than a decade, a similar eyepiece series, called Pentax XL, has been available. On the outside, the XW eyepieces appear virtually identical to the XL units, but the XW eyepieces use improved types of glass and a modified optical design that offers 70-degree apparent fields of view compared with 65 degrees on the XL eyepieces. (A typical Plössl eyepiece has a 50-degree field.)



## A VISIONARY DESIGN

Among the most innovative astronomical eyepieces ever produced, the Pentax XW series each has 20mm of eye relief with generous 70-degree apparent fields of view. Adjustable eye shield is shown fully extended on the 5mm and fully retracted on the 3.5mm.

Much of the effort in eyepiece design in the past half-century has been a quest for wider, sharper apparent fields of view—the width in angular degrees of the circle of view seen in the eyepiece. But that alone is not enough. There is no point in claiming a 70-degree apparent field if only 50 degrees of it is sharp. My tests of the Pentax XW eyepieces on a Sky-Watcher 8-inch f/6 Newtonian and a 4.2-inch f/5 Takahashi double-fluorite refractor left me convinced that even the most discriminating observer will be pleased with the pinpoint images these eyepieces deliver.

The other equally impressive feature of the XW eyepieces is the 20mm eye

relief—the distance the eye needs to be from the eye lens for a full-field view. This is especially welcome in the shorter focal lengths, under 15mm, where many eyepieces require the eye to be uncomfortably close to the eye lens. Each eyepiece has a threaded eye shield that can be screwed up or down to provide the ideal eye position for each user, whether wearing glasses or not. I found this feature exceptionally comfortable.

Although these eyepieces appear somewhat bulky, all weigh between 355 and 405 grams, quite comparable to other premium wide-field eyepieces. In terms of definition, Mars near opposition appeared identically detailed in the 5mm Pentax XW as it did in a 5mm Tele Vue Radian when used on an Astro-Physics 6-inch apo refractor (yielding 220x). Tele Vue Radians, which have 60-degree fields and 20mm eye relief, are about the same price as the Pentax XWs and are regarded (by me and many others) as superb high-definition eyepieces.

The 40mm and 30mm XW eyepieces were not available in Canada at the time of our test, so we concentrated here on the 20mm to 3.5mm sizes, which are the more innovative in the series in any case. They are priced at about \$440 each and are available through most Canadian telescope stores.

The Pentax XW 3.5mm deserves special mention. It is all new. The shortest of the old XL series was 5.2mm. When used on a short apo refractor such as the Tele Vue 85 (600mm focal length), the 3.5mm yields 171x with a tack-sharp 70-degree field of view for outstanding planetary viewing.

My only suggestion for improvement for these highly recommended astronomical eyepieces would be to design them with dual fittings for both 1.25- and 2-inch focusers, but that's a minor quibble. Based on past experience with the XLs, the new series should retain excellent resale value as used equipment.

When selecting eyepieces for the long term, keep in mind that your 1.25-inch eyepiece collection will fit the focuser of any telescope you may own in the future. If you trade up to a better scope, you typically continue to use the same eyepiece collection. For this reason, owning one or more premium eyepieces is, in effect, a permanent upgrade to your astronomical equipment. ■