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Vixen 30x125 vs ITE LABT-100s

by Allister St. Claire



Introduction

Through no planning or grand design, I found myself in possession of 2 pairs of giant binoculars. This is a rather unusual state of affairs as many amateurs haven't even looked through a pair of giant bins let alone own two at one time. Giant binoculars have traditionally been viewed as something specialized or exotic. Few amateurs have actually spent much time behind the eyepieces of such instruments. Typically someone at a star party owns a pair and people get their brief exposure to a pair there.

Over the past several years I've watched a quiet but steady increase in the level of interest in giant binocular observing. New giant binocular models have entered the marketplace and increasing number of amateurs are using binoviewers. Two eyed observing is natural, comfortable and can knock the socks off you the first time you try it. Having watched neighbors and other amateurs look through mine, I can attest to this personally.

What follows is the collection of my comparative notes from the past two months of using both instrument. I'll go over the specifics of each instrument and then spend the rest of the article comparing the two on five variables: **magnification, secondary color, contrast, FOV** and **ergonomics**. This comparison was a rather complex one as these two instruments are more dissimilar than like. I would never have guessed this prior to using them and looking back I can't imagine why I had the conclusions I did before I owned them.

So, without any further ramblings, away we go.

LABT 100s (\$1795 from ITE)

The labt-100s are actually the Chinese Border Patrol binoculars (sold by several companies in the U.S.) which have been retrofitted with standard 1.25" helical focusers by ITE. The standard Chinese Border Patrol binoculars come with a two rotating turrets on which there are two fixed eyepieces - 25x and 40x. ITE pulls these turrets/eyepieces off and installs standard 1.25" helical focusers. This gives the owner three distinct advantages;

1. Ability to use the eyepieces that YOU prefer
2. Ability to use filters (deep sky, sky glow, etc)
3. Ability to vary the magnification

The value of using the eyepieces you prefer cannot be overstated. Over time I've come to the firm conclusion that eyepiece preference is the most subjective and personal decision that one can make in amateur astronomy. One variable that person A loves, person B doesn't find relevant in their purchasing decision. Eye relief, FOV, contrast, size, susceptibility to fogging (a variable I find different than eye relief), the list rolls on. On the flip side, the presence of certain variables may make an eyepiece distracting or unacceptable for some amateurs. Compound this decision with people's varying ability to merge images in binoculars or bino-viewers and you have yourself a real challenge. Consequently, if you buy the LABT-100s you have the peace of mind that eventually you will find the right eyepieces for you.

Having the option of using filters is an advantage that varies with how often you use them with other telescopes. Certain objects benefit immensely from the use of filters while many others show little to no benefit. David Knisely has written an exhaustive analysis of which objects benefit from filters and his findings with telescopes are applicable to binocular viewing. His review is posted on Cloudy Nights at filter performance.

Varying the magnification is the biggest advantage of the Labt-100s and also one of the most complex with binoculars. I'll cover this in detail later in the review under the magnification heading.



Physically, the Labt-100 binoculars are 26 lbs with the sturdy wood tripod coming in at around 15 lbs. I carry the entire setup out of my garage and around the yard with a moderate amount of effort. If you wish, the binoculars and center post can be separated from the wooden tripod by simply turning the numbered locking collar on the top of the tripod and pulling up on the post. The binoculars and permanently attached center post can be stored in the foam padded military case that they are shipped in. The wooden tripod does not come with a case but they really don't need one.

The tripod itself is adjustable in height and is fairly sturdy for the range of magnifications the labt-100s are capable of. There is a center, plastic spreader assembly which one can attach a standard GP accessory tray to. The feet of the tripod come to a dull point. These are meant to be dug into the earth when used but I never found any stability problems when I used them on my sidewalk.



There is a small knob underneath the body of the binoculars that moves them up and down in very small increments. I believe this betrays it's military purpose (artillery spotting binoculars). I couldn't find any use for it as moving the binoculars up and down in very small increments isn't something I need to do for astronomical observing.

The binocular dimensions are somewhat unusual as both objectives are housed within the body. This is different from standard binoculars which house the objectives in separate bodies. I assume this makes them hardier in the field or bouncing around in the back of a Chinese artillery officer's jeep.

The ability to collimate the Labt-100s makes them truly distinct in the giant binocular world. All other giant binoculars I am aware of must be shipped back to the manufacturer or a 3rd party optical shop to align the optics. With the Labt-100s two ports open on each prism turret. By using a pair of needle nose pliers the owner can collimate the binoculars by adjusting the prism assembly up-down or left-right. Bill Burnett at ITE has the exact instructions on how to do this and can fax them to any Labt-100 owners out there.

Vixen 30 x 125mm (\$3995 from any Vixen reseller)

I reviewed a pair of Vixen 30 x 125mms roughly 18 months ago. I purchased a second pair from the Vixen Clearance section for a price I believe these binoculars are worth. Per my other article, I still believe \$4000 for the fixed magnification Vixen 125mms is a bit steep. This second pair is much better than the first with the optics being perfectly aligned this time.

The Vixen 30x125mm are a doublet F/5 achromat with 45-deg angled eyepieces and a nice fork-armed binocular mount. The overall fit and finish is very nice and I couldn't find any areas where Vixen may have skimmed to save costs. The objectives are recessed several inches within the body of tube so you don't have to worry about dew or glare if they are at reasonable levels.



Each eyepieces is individually focusable by simply turning the eyepieces itself. The eyecups fold down for those who need additional eye relief. Eye relief is rated at 20mm and the eyepieces are reasonable comfortable to use. The eyepieces appear to be Vixen Lanthenums but I have no way to verify this.

Each prism turret rotates allowing the user to adjust the interpupillary distance. For new users the proper sequence is as follows (I have to tell neighbors this each time they look through them);

1. Ignore the view and adjust the interpupillary distance
2. Close one eye and focus
3. Close the other eye and focus
4. View

As you may surmise, the above means a newbie or neighbor ends up fussing around the eyepiece and turret for a little while before they get an acceptable image. If you have a group of people who wish to look through your Vixens and they've never used giant binoculars before, you will have quite a little fuss

party on your hands. These may not be the best instrument for a star party but this is dependent upon how patient a person you are.

Currently, Orion Telescopes (the Vixen importer in the U.S.) only resells two models of the Vixen 125s - the 20x125 and the zoom model 25-75 x 125mm. I believe you can still order the 30x125mm version but it will be a special order item. I've only seen the Vixen 125mm binoculars on the used market a handful of times in the past several years. This either indicates the owners are extremely happy with them or very few are sold.

Magnification

The advantages of increased magnification in binoculars is covered in an excellent article by Alan Adler which can be found at Todd Gross astro site (www.weatherman.com). Alan comes to two important conclusions that are relevant to this review;

- a. Magnification is more important than objective diameter for object viewing
- b. A comparative index of binocular "viewing power" is the square root of the objective x magnification

It's taken me a while to realize A, but within reason (say 20mm of each other), increased magnification will overcome the advantages of a larger objective. This can be seen by using say 10x35mm and comparing them to 7x50mm binoculars on several objects. In my case, as I'll go into detail later on, this was apparent between the Vixens and Labt-100s.

I've also found with both the Labt-100s and the Vixen BT-80s, having the ability to vary the magnification increases the number of viewable objects exponentially. Double stars, lunar, cluster resolving, details in brighter galaxies and nebula - all benefit from increased magnification. I can't emphasize this enough, varying the magnification opens up a number of possibilities you don't have with fixed power binoculars.

If you accept Alan's "Astro Index" of the square root of the objective x magnification, than the Labts vs Vixens look like this;

Magnification	Labt-100 (square root - 10)	Vixen 30 x 125mm (square root = 11)
30x	300	330
40x	400	N/A
50x	500	N/A
80x	800	N/A

As can be seen, the Astro Index of the Labt-100s is roughly 2.5x that of the fixed power Vixens. Still not convinced of the utility of such an index? Allow me to cite two easy examples;

1. How much more do you see on the moon at 80x than at 30x?
2. How many more double stars can you split at 80x than at 30x?

If you read the ITE description of the LABT-100 binoculars, you may come away slightly befuddled on what the maximum magnification actually is. Allow me to cite the paragraphs verbatim;

In contrast to other similar units on the market with fixed eyepieces on a turret assembly, ITE's LABT-100s are modified to permit the observer to use any matched pair of user supplied 1.25" eyepieces, with or without a 2X "shortie" barlow in place, for powers in the range of 16X on up to 200X!!! (NOTE: Please keep in mind that these units are best used at low to medium power in the 20 to 80X range. This is where they excell in concert with the optical design).

Later on, Mike Palermi, an optical consultant who tested the Labt-100s writes in his optical report;

What about other eyepieces and magnifications ? I used several different matched eyepiece sets to obtain a range of magnifications from 20X, with a 3 degree field of view on up to 125X with a 0.3 degree field of view.

After using mine for two months I found the upper threshold of magnification to be between 80-90x. It should be noted that I strongly prefer lower magnifications over higher magnifications as I find I don't gain any additional detail over a certain threshold. Consequently, one can say I'm biased against higher magnifications.

To get to the heart of the matter, I called both Mike and Bill and spoke with them at some length. Both told me that the Labt-100s peak out below 100x. Mike reports his 125x reference was an ultimate test of resolving power and not something many amateurs would be interested in. Bill comments that the 200x reference on the ITE webpage refers to using the Labt-100 in single ocular mode - use one tube as a telescope. Consequently, one can safely assume that the upper magnification end is somewhere below 100x. Mind you, that a pair of binoculars can attain a 100x is simply unprecedented and no small optical feat!

Secondary Color

Both pairs of binoculars exhibit secondary color on bright objects. However, the LABT-100s show less color than the Vixens. The Vixens are somewhat sensitive to head position and whether you focus/have your eye at a certain point you will either see a green flare/halo or a purple flare/halo on bright objects. The Labt-100s show a simple green regardless of head position or focusing.

How distracting is the secondary color? Very bright stars show the Vixens at their absolute worst. Mag 2

stars or brighter and you have a somewhat spiky purple green blob. The "spikey" reference is different than my prior pair of Vixens which were misaligned. What I'm referring to here is the sensitivity to head position such that a slight movement one way or the other will flare either purple or green. It should also be clarified that "sensitivity to head position" is caused by the design of the achromatic optical system, not by something "wrong" in the system.

However, moving on to deep sky objects or mag 3 stars or dimmer and you no longer have a secondary color problem. The Vixens are designed for deep sky viewing and using them on other objects is using them for purposes they never were intended for.

The Labt-100s show a consistent modest lime-green halo around bright stars. No spikes or flaring.

Oddly enough, on the moon both show the same amount of secondary color and gone is the purple spikes in the Vixens. I can't imagine why this is, but it is a tie for secondary color for lunar observing.



Contrast and Performance

While using the Vixen 30x125mms, I was satisfied with their optical performance. Using a pair of 125mm astro binoculars is something that has to be experienced at least once in your life. However,

once I placed the Labt-100s next to them, differences in performance quickly became apparent. I mention the above to emphasize the usefulness of performing an A/B comparison between instruments. Relying upon "memories" or references to other instruments is inherently flawed and makes for a poor review. Our eyes and neural pathways go a long way to "adjusting" to some of the optical distortions our instruments may be showing us. By moving back and forth between instruments, one can keep their neural system from adjusting to any level of optical problems.

The Labt-100s exhibit moderately better contrast. The sky background is blacker and lunar features are more distinct. This surprised me as I expected no differences in contrast between the two pairs of binoculars. My guess is either the prisms in the 45-deg Vixens are soaking up/scattering some of the light or the Labt-100s are simply better baffled. I don't wish to overstate the case of the contrast differences, it's there, it's moderate but definitely noticeable.

Another noticeable difference deals with point sources of light. The Vixens are unable to bring a bright star down to a distinct point or ball (same with my 1st pair of Vixens and also with a pair of a gentleman I corresponded with). Per the above comments on secondary color, the star is either slightly spiking purple or green. The Labt-100s are able to bring a star down to a nice point of light with a modest lime green halo. This is the most distinguishing difference between these two binoculars if you have them pointed at moderately bright stars. On deep sky objects or fainter stars, this difference doesn't exist.

Ergonomics

In this category the Vixens win hands down. The comfort factor of the 45-deg angled eyepieces is overwhelming in comparison to the straight through viewing of the Labt-100s on their standard tripods. The Labt-100s are comfortable up until about 55 degs parallel to the ground. Beyond that you begin to strain and I was unable to use them after 65-degs. The ergonomics of tilting your head back is one that will catch up with you after about 15 minutes of viewing once you go beyond that 55-degs. The Labt-100s are comfortable up to around 75-degs and after that it becomes a bit of a strain. When I view with any instrument it's critically important to ME that I'm comfortable for the 1-2 hour viewing periods that I have in my life. Instruments that are uncomfortable to use or difficult to setup simply don't get pulled out of my house.



Vixen and Labt-100s at Allister's max comfort angle

However, all is not lost to the Labt-100s in this category. While it may not sound like much, using the Labt-100s to view 55-degs or lower is in reality a rather large swath of the sky. I used the Labt-100s exclusively for 2 weeks prior to spending another 4 comparing it to the Vixens. During that 2 weeks I really didn't find myself too terribly constrained in my choice of objects and had quite a lot of fun. For the long term I would suggest the Millenium Mount which costs an additional \$799.00. This will allow the Labt-100 owner to gain access to the entire sky and even observe from the comfort of a lounge chair. Now what's more comfortable then that?

The smooth movements of the Vixen mount also beats the Labt-100s hands down. The Vixen fork arms swivel smoothly atop the tripod and there is even a tension knob to adjust the amount of resistance when moving side to side. The binoculars themselves have teflon coated knobs and two additional tension knobs to adjust the smoothness of the up-down movement. I couldn't find any faults with this aspect of the Vixens. All movements were smooth, steady and precise.

Once again, the standard mounting for the Labt-100s betray their military design purpose. There is no teflon here and moving the binoculars at magnifications over 60x was somewhat rough and a little jerky. Once I hit the max magnification of 90x, the mount was also hitting it max for moving the binoculars around. Rough or jerky movments at 20x is really no big deal but at 90x is overwhelming. If your intent when buying the Labt-100s is to use them at or near their max magnification much of the time (say lunar observing), you will need to budget the extra money for a different mounting system.

FOV

The Vixens 30x125s are officially rated at 1.6-degs of the sky while the Vixen 20x125s are rated at 3-degs. Per my first article I prefer the higher magnification of the 30x Vixens for three reasons

1. From my suburban home the Vixen 30x kicks back the sky glow much better than 20x binoculars do
2. All objects that can be seen from a suburban home look better at 30x
3. It 's a rare night I can perform rich field viewing reasonable well from my home.

However, the actual viewable FOV of the Vixens is actually something around 1.45-deg (a rough estimation) due to an indistinct field stop. In a standard high quality telescope/eyepiece, an object can drift into the edge of the field stop and look fine. In a lesser quality instrument/eyepiece, there are typical aberrations out in the outer 15-20% of the FOV. Typically this is neither noticeable nor intrusive as most of us aren't looking at the edge of the FOV anyway. In the Vixens the outer 15% of the FOV is not only blurred but also a lighter gray color. Those who appreciate "sharp to the edge" views will not like looking through the Vixens as the problems at the edge are noticeable and distinct due to the "lightening" of color in this area. If, like me, you find the outer edge definition of binoculars to be overrated, then you will be content with this aspect of the views through the Vixens.

The Labt-100s on the other hand act like a standard telescope in this respect. While the Labt-100s have some optical distortions in it's outer 15% fov, the illumination doesn't drop off like the Vixens. Consequently it's much less noticeable and rather good for giant binoculars. If you view objects anywhere near the center FOV, you will never notice the outer 15% distortions and it really isn't any different than most eyepieces/telescopes I've looked through.

The Labt-100s have the incredible versatility of not only going to 3x the magnification of the Vixens, but also being able to view a much wider swath of the sky. With 30mm plossels the labt-100s are capable of 2.5-deg views of the sky. Have a little sky glow the night you are observing? No problem, pop in some 20mm plossels and you're at 30x. Here the Labt-100s handily beat the Vixen 30x125s.

Conclusions

Way back in the article I stated a premise that within 20mm of each other, increased magnification will overcome larger aperture objectives in a pair of binoculars. I found this to hold true in the Labt-100 vs Vixen 30x125 comparison. By simply increasing the magnification, the Labt-100s could equal or exceed the performance of the Vixens on many objects. Throw into the mix the better contrast and optical performance of the Labt-100s and the Vixens only modestly outperform the Labt-100s on deep sky objects at the same magnification from my suburban location.

Looking at the optical designs, one really shouldn't be surprised. The Vixens are F/5 doublets while the Labt-100s are F/6.25 triplets. No matter how well made or how smooth the figure, F/5 doublet achromats can only perform so well. However, before you think I'm knocking the Vixens, it must be remembered that they are designed for deep sky use only. If you visit the Vixen home page you will find posted there in bold letters "Most suitable for observation of comets, nebula and star clusters". For this purpose they work wonderfully.

While the optics of the Labt-100s are in it's favor, the ergonomics, smoothness of the mount and fit and finish are **STRONGLY** in the Vixen's favor. Being comfortable while observing can't be overstated and may make the difference between being used briefly or not being used at all. Each of us understands our own needs and biases best so how important this category is to you is an extremely personal one.

At this point I'm not going to draw any further conclusions. I believe each of these binoculars will appeal to different amateurs depending upon what is most important for you and what you will be using them for. I've done the best I could with this review and only hope it helps those seeking a pair of giant binoculars.

Best of luck to you giant binocular observers!