Jupiter Observations. **Comparing three sizes of binoculars.**

10x50 Bak-4 fully multi coated porro prisms, 96 metres at 1000metres
12x50 Bak-4 fully coated porro prisms, 92metres at 1000metres
15x70 Bak-7 fully multi coated porro prisms, 77metres at 1000metres

8/04/17-9/04/17 Initial observation started at 23.55 (all times quoted are local)

Results

10x50 Jupiter seen as a disk, with only one moon visible

12x50 Jupiter clearly seen as a disk with three moons visible. One moon to the West of Jupiter and the other two to the Eastt, all in a straight line, the Easternmost moon being the brightest with the two others at the same brightness.

15x70 Jupiter very clearly a disk and I could just barely see a darker belt although the air was beginning to feel moist and there was a definite halo forming around the moon. The indications were that seeing was deteriorating. All four moons were clearly visible with three to the East and a single one to the West. The middle of the three Eastern moons was the brightest by far with the outermost one next brightest followed by the one on the Western side of Jupiter third brightest and finally the one closest to jupiter on the western side the least bright. This variation in intensity could possibly be due to their apparent proximity to Jupiter which was very well illuminated and showing a halo. All four moons formed a straight line.

Visible through all three pairs of Binoculars I could see a star about 20°to the East.
I was initially surprised at the difference between the 10x50 & 12x50 binoculars considering their only slightly differing specifications.
The next day I checked with Stellarium what I had seen and am pleased that my observations tallied with Stellarium. (so my eyes are not as bad as I was expecting)
The star I saw was HIP 64238, and the four moons were from East to West – Europa, Io, Ganymede and Callisto.

Jupiter Observations. 9/04/17-10/04/17 Initial observation started at 23.45

Results

10x50 Jupiter seen as a disk with no discernable detail and three moons visible-one to the East and two to the west in a straight line, I also noted that vision in my right eye is makedly better than my left. I adjusted the binoculars to the best focus I could with my left eye before adjusting the right eye and found that with just the right eye open I could see three moons whilst with the left only the two to the right.

12x50 Jupiter seen as a disk much brighter than with a) but not discernably larger. I observed with my left eye and saw two moons, both to the West, then with my right eye and again only saw two moons. Using both eyes still revealed just two moons

15x70 Jupiter definitely a disk, and three moons with both eyes together and with right/left eyes closed in turn, although the right eye was much clearer than the left.

I tested all three pairs of binoculars a second time and found three moons visible with both eyes.

10x50 produced very little difference although I noticed that my left eye was slightly off focus and I was unable to see Jupiter and as I looked directly at the moons they too became blurred. At the time I assumed there might be a smudge on the optics. Both 12x50 and 15x70 produced no discernable difference than in the initial test.

Seeing was much better tonight with no lunar halo and less moisture overhead.

Jupiter observations for the night of 10-11/04 was not possible with overcast skies.

Jupiter observations 11-12/04/17. Observations started at 11.30 Sky cloudy but with sporadic breaks in cloud.

10x50 Unable to see Jupiter clearly and no visible moons although there seemed to be a bulge to the right (westerly) edge of Jupiter. Adjusted binoculars and using right eye was able to see jupiter clearly with one moon very close and to the West of Jupiter. My Left eye was still not focusing and I could just make out a blurry bulge as before.

12x50 At approximately 00.15UT I started observing with these binoculars. With my left eye I could just make out 2 moons to the west of jupiter but both they and jupiter were out of focus.

15x70 I could see Jupiter and all four moons with both eyes, separately and together, but with my left eye there was definitely a slight blurring of all the moons as well as jupiter when I looked directly at them.

By now I believed that I had a problem with my left eye and temporarily suspended observations.

25th-26th/04/17 2340 local time. Resumed observations after eye tests and at first clear-ish night, using all three pairs of binoculars using right eye only. Weather fine - cloud with occasional clearer patches high level of moisture in atmosphere.

10x50 Able to see jupiter as a disk two moons to the West of jupiter and one to the East. Very washed out due to dampness.

12x50 Able to see three moons and Jupiter clearly with slightly better view than with 10x50. Again washed out out but noticeably better than with 10x50.

15x70 Jupiter clearly a disk and well defined, three moons easy to spot although, as before, still washed out.

Initially when using the 12x50's and the 15x70's I saw three moons and what I assumed was a star apparently close to Jupiter to the East. On checking with Stellarium the next day I was surprised to see that the 'star' was in fact callisto. I can only assume that Callisto was obscured by the bright washed out halo effect of Jupiter which made me think it was a star.

27-28 April. Final observation in this series. I have acquired a new pair of 10x50 6.5° binoculars 96metres at 1000metres via a part exchange for the original 10x50's. I tried them prior to making the deal and found the diopter adjustment better suited to my eyes and for the first time I was able to achieve focus with both eyes, which I have been unable to do with any binoculars previously.

Tonight was intended to be very brief observation, mainy to test the new 10x50's. Time started 0005 local time with seeing very good.

10x50 Results. Using both eyes together and each eye separately.
With both eyes Jupiter a definite disk very sharp and three moons clearly visible and bright.
With right eye only Jupiter very finely defined as a disk and three moons seen clearly.
Left eye only – Jupiter seen as a disk with very slight blurring. Three moons visible and bright but very slightly blurred when looking at each moon directly.

15x70. With both eyes, then each eye separately.
With both eyes Jupiter seen as a disk but not as clearly defined as with the Nikon's. Three moons clearly seen.
Right eye only Jupiter definitely a disk and very clearly defined, as are three moons.
Left eye only jupiter definitely a disk but very slightly blurred. The three moons bright but again blurred when looked at directly in turn.

Happy with the results of the new 10x50's at approximately 0100 local time I decided to take a look before retiring, and saw what appeared to be a bulge to the eastern edge of Jupiter. I continued watching for about twenty minutes and the bulge resolved into the fourth Galilean moon. This was the first time I have seen all four Galilean moons during this observation period that can be positively identified.

Conclusions

The main problem I have is with my eyes. A very small cataract has been discovered in my left eye virtually in the centre which makes everything I see in the centre of my vision slightly blurred. In normal use this is not a problem but through binoculars and telescopes it causes some distortion. The second is the difference in the focus of both eyes as I have not been able to adjust the diopter enough to bring the right eye into focus with the left eye. This has been overcome with the new 10x50's and with them I can see for the first time with both eyes perfectly (apart from the central and now almost un noticeable blurring in my left eye)

The 12x50 binoculars give a narrower field of view (92m at 1000m) than the 10x50's (96m at 1000m). The image is very sharp and I believe these are a good pair of binoculars. They are suitable for general astro observing and may even be useful for larger deep sky observations. (I will be testing them for this at another time). They are easy to grip, being housed in non slip rubber with raised dimples for thumbs. They have a threaded socket to attach a tripod bracket allowing them to be fitted to a tripod.

The 15x70, as expected, had a much clearer view and show a sharper image with a much smaller field of view (77m at 1000m). They are heavy and most suited for use with a tripod, a threaded socket is built in. Again, these binoculars are housed in a non slip rubber with raised dimples for added thumb grip. A very good pair of binoculars and excellent value in the lower price range for astro use. I suspect that my first observation that I was able to see a dark belt on Jupiter with these binoculars must have been fanciable as I was not able to observe the phenomena again, so not claimed as definite. (I believe that on a stable tripod jupters belts may well be visible).

The original 10x50's, light with rubber housing and easy to grip, unfortunately I cannot really remember how they felt in use and can only say that the image was not as clearly defined as with the newer 10x50's, probaly due to the problem with my eyes as described earlier. It would be unfair to give them a bad mark under the circumstances.

The new 10x50's have quickly become my favourite pair as the diopter adjustment is more suitable for my eyes. Jupiter was sharply defined, much brighter and the Galilean moons brighter and sharper. I was able to see many more stars than with any other pair of binoculars, again due to the fact I was able to use both eyes together. Non slip rubber housing and lightweight and can be used on a tripod, with a suitable bracket.

I should point out the 12x50's were gifted for use at outreach events and these are the ones I will be bringing to future events.

Included with this report are sketches taken immediately following the times of observations and screen shots of Jupiter and moons as shown by Stellarium - usually taken the following day - for comparison.

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