

The ATN PS-22 clip-on night sight is a device that people ask about on a regular basis. The reason people ask about it is simple- a clip-on device is the answer to a lot of the downsides a dedicated NV weapon sight (from here on out a DNVWS) has. I'm not saying that a clip-on is better than a DNVWS in every case and a clip on has its own negatives as well but I do think they are a much more flexible option if you have a lot of rifle options or hunt in a variety of different situations- its really down to what you are trying to do with your NVD. The biggest disadvantage to a clip on has always been price and the PS-22 is about the same cost as a quality monocular- that's why people who are hands down scared of ATN products are still curious about this system.

The following information was gathered over a 13 month period and the scope of this project was based around night time hunting. If you are HALO jumping into harms way, a purchasing agent for the military, anyone who plans on saving the world, routinely kill bad guys at night, or just someone that can spend somewhere around \$10k on an optic with out thinking about it then you should probably just go ahead and buy something else.

The reason we tested these systems and then took a closer look was because although people in the group own several of the milspec clip-on systems all of us have friends that said "I love that clip on but I will never spend that kind of money on one". Well, we had heard of the PS-22 and finally met some people that owned a couple. From talking to them we learned that the unit was hit or miss, with some people saying that they loved them and others describing several issues. That made us even more curious because of the wide range of reviews the system got. So several people, many from this very site, got together and spent a lot of money and a **whole lot of time** to learn the truth about the PS-22.

Here is what we learned:

Last year a couple members here posted that they purchased two factory PS-22s from Cabela's and proceeded to test them on 5.56mm and 7.62mm AR platforms. We considered these as our 'control' systems. The review was posted on ARFCOM here and despite only testing two systems, we saw similar results to what were told by other PS-22 owners- 50/50, hit or miss. One unit shot great, one had a considerable offset shift. So, on we went. We started with the heart of any NV system, the tube. Our Cabela's systems had Russian EPM tubes installed that looked ok for Gen 2, but still didn't hold a candle to US Gen 3. Upon disassembly, we found that the housings were designed for the EPM tube and not for the longer MX-10130 (PVS-7) tube. An ARFCOM member, Last Lancer, posted that the MX-10130 tube fit but it appeared he was incorrect. That is pretty rare for LL so I picked up the phone and called ATN. I wasn't expecting much but actually I was passed over to someone there that was eager to answer my questions. ATN did make the PS-22 housing for the MX-10130 and you have to order it that way. From what I was told this is not hard to get but chances are that if you buy one of these systems at a retailer or off of Ebay to convert to Gen 3 you could easily get the wrong housing.

After dissecting the PS-22, inspecting the system and talking to ATN, the group decided to buy a number of the PS-22s to build up and test. 7 units were ordered and we built them up using our own MX-10130 tubes. When the units were torn apart we learned how ATN designed their clip-on.

* I will shift gears here for a second and explain how a clip-on works for those that don't fully understand. A clip-on differs from a monocular and DNVWS because, in simple terms, the image must exit the system *exactly* in parallel with the image entering the system since it sits in front of a day optic (that has the aiming reticle). In a monocular this isn't an issue because the NV portion typically resides behind the aiming reticle. To the shooter its never an issue because the reticle has been boresighted to the rifle- either independently (as with a monocular behind a daytime reflex weapon sight). With a dedicated night vision weapon sight any shift through the system is as easily corrected by adjusting the reticle to compensate for shift. Since the DNVWS is just that- dedicated- any shift goes unnoticed. When a clip-on is used the shift must be perfectly corrected or there *will be* a point of impact shift differential between the day only optic and that optic with a clip-on in front. The clip-on also differs from other NV devices because it has to have the output optics optimized for use in conjunction with magnified day optics. Where a mono or a DNVWS have magnified ocular eyepieces the clip-on has relay optics- you could almost think of 'de magnified' optics. There are several ways to correct the shift in a clip-on- you can use a prism set (risley prism sets) or offset the objective/output optics. Both designs are employed by the milspec manufacturers and both have pros and cons. A few patent searches on these manufacturers and these devices will explain further but for now we will head back to the PS-22.

The PS-22 has a prism but its not used used for collimation, it is used to invert the image since it uses the MX-10130 non-inverting tube. The collimation is performed with offset output optics and it is a relatively simple but effective design. There are some caveats to using this method but it works fine if you understand how to mitigate these issues and I will explain more on this at another point. In order to collimate any clip-on you have to use a collimator (where did they get the name, huh?). Companies use a collimator tunnel that allows this work to be done during the daytime work hours. It doesn't take up a lot of room, its very precise and typically expensive. There is another way that works very well- build a collimator range of longer distance and tell your wife you have to work late. (We used this method) It isn't real state-of-the-art but it was less than \$2k and just as accurate, weather permitting. At this point we were able to use a Gen 3 tube and collimate the system- still a long way to go. On to the PS-22 housing and optics:

The PS-22 has some nice features, using a 80mm, F/1.44 catadioptric lens package that allows for increased light gathering like the PVS-22 and PVS -24 clip-ons. The optics and mirrors are held in with threaded steel rings and sealed with o-rings like most other optical devices. The cat package threads to the body and set screws lock it in place like other companies do- nothing special or cheap from our observation. Internet claims discussed objective lenses being loose and causing POI issues. I find this pretty funny because that if this had actually happened the user would have had a massive focus/image picture issue *long* before the 'loose objective' lens caused a shot group issue. Unlikely claim IMO. The lens sets on the front and the back are AR coated and appear to do their job. Focus is achieved like the PVS-4 by moving the tube instead of an optic. You could debate this design but I think the durability of the PVS-4 proves the point- it was determined that the tube housing was not/could not be an issue with regards to POI shift and more importantly, wandering shot groups(boresight retention). The shooter focuses the PS-22 by rotating a focus ring that drives what I called 'external half nuts' inside the unit mounted to the tube housing. I don't really like the focus on the PS-22 but it does focus- although not as smooth as other optics.* The housing is aluminum, some anodized parts, some painted. It is nitrogen purgeable and waterproof. Various small hardware was black oxide steel and so was the QD mount- which was a nice change over a previous non-QD mount- the mount does work well with no issues noticed and received several compliments from the test group.

So we have a rundown of the PS-22 and its components along with what and how we going to build it up. So far its been a pretty

positive look at the unit and have I waited to this point to describe what we didn't like about the PS-22...

The main issues we noted with the factory PS-22 from ATN (in order) were:

-The collimation of the unit- ATN is hit or miss with their collimation and performing a tension relief process after collimation. This is primary issue with factory ATN PS-22s.

-Tube quality (even when a factory Gen 3 PS-22 was purchased)- we had no idea and still have no idea what these tubes are in Gen 3 factory systems. Some have looked better than others according to other PS-22 owners but its subjective at best with no real spec or details about the image intensifier.

-Attention to detail during assembly. We found the units with metal shavings and other foreign object debris in the housing on factory units and in the housings we received. Additionally, various hardware and small screws were torqued to various degrees. Thread locker was used most of the time but in several key locations thread locker was missing.

At this point we had cleaned and assembled the systems using MX-10130 C and D tubes, collimated the units, shook them down, checked them again and then put them on a variety of weapons for long term testing. We looked at other issues that could affect the boresight retention. One question was daysight/PS-22 optical centerline alignment and if a misalignment would affect POI shift. First we checked the system on the collimator range by shimming the PS-22 until we saw any change in a previously collimated unit. Then we shot the units on many different platforms with different optics and noted the height differential, looking for associated POI shift. We learned that the PS-22 maintained its boresight retention until the PS-22 was extremely off centerline, beyond .5 inch which was beyond our expectations. The unit optical centerline sits 1.65 inch from the top of the Picatinny rail on the firearm and its recommended to keep the PS-22 within +/-2.5mm of the optical centerline on the day optic- in other words, we mismatched it to the extreme and although we didn't see a problem it would be a good idea to get mounts for the day optic that are close to the height of the PS-22 because there are some variables in day optics that could be an issue. So here we are with a bunch of built systems ready to view and live fire.

Before we shot them we looked at them side by side compared with a OSTI PVS-22 and Knights UNS-SR. Later, we compared the PS-22 to a PVS-24 as well. The side by side visual comparisons were made with similar AR-15 rifles, both topped with identical ACOG TA-01 NSN 4x scopes. Viewing the system side by side at the same images in various high and low light conditions we were all pleased that the PS-22 looked *very* close to the PVS-22 and handily outperformed the UNS-SR at times. Tube specs came into play at this point but in blind test most of the testers were unable to repeatedly pick out which unit was 3x the cost of the other and no one has ever thought the PVS-22 performance was worth the cost difference when compared simply by viewing the systems side by side using their eye. That's not a fair comparison but I feel the need to say it anyway because people always ask how it looks compared to a real-deal PVS-22. One difference we did note is the PS-22 was more sensitive to veiling glare than the PVS-22. The glare was noticed when strong light was present outside the field of view- in normal conditions this issue was not present. The design of cat lens system in the PS-22 could be cause but OSTI set their lens farther back in the housing most likely to combat the same issue. A simple 'moonshade' was usually the cure for this issue. The UNS-SR did not exhibit this issue because the veiling glare is a common issue with cat lens system and the UNS-SR does not use this lens type. The PVS-24 has its cat lens set even farther back in the housing and has a smaller diameter lens which appears to have the least issue of all the units with cat lenses (in my experience). Then we moved on to day optics having variable magnification- we were able to test how the system worked at various power. The PS-22 works from about 1.5x to 6.5x and performance drops off fairly quickly after that. The PVS-22 will work well to 8-8.5x and we owe this to the larger output lens on the PVS-22. (21mm vs. 40mm). So now the shooting starts.

The PS-22s were shot on the following calibers: 5.56mm, 6.8mm, 7.62x39mm AR platform, .308 AR platform/SCAR and .308 bolt action AICS rifles. For a while the PS-22s would be shot 100 to 150 rounds and then checked on the collimator to verify boresight retention. Later on, the units were used for hunting and target/plate/paper shooting and all were periodically shot at paper for POI shift/drift check. I wanted to have exact round counts for each unit but since the units were passed around or loaned out to other shooters so often and so quickly this was not possible. I polled each unit tester and as of now, the best I can quantify is that the test systems all have between 500 and 1500 rounds fired with the exception of one unit. Over the course of the test period I did not re-collimate any of the units except for one unit that the tester wanted to switch out his MX-10130C tube for a D tube. **The PS-22s were capable of shooting sub MOA groups with the average falling around 1.5 MOA at 100 yards.** None of the units have had POI shifts greater than 1 MOA and at **no time** did anyone experience grouping issues (drift). We were pleased with the test results.

Conclusion

The PS-22 is a low cost, commercial clip-on that has merit but requires some additional work to make it a solid hunting device. The housing components are quite good and when combined with a nice Gen 3 tube the unit is more than capable of performing very close to the level of a much more expensive clip-on device. If a clip-on NV is on your 'must have' list but the \$9k price tag is a deal breaker you still have an option- especially if you are the DIY type. The learning curve is a little steep but its not out of the realm of many of the intelligent and skilled members here. In addition to the paper we punched testing the PS-22 we killed *hundreds* of feral hogs, coyotes and varmints along the course and continue to do so with the PS-22- I suppose the proof is in the pudding there. All in all, the group spent a total of \$20,000 to learn about the PS-22. Like I stated above, many of them are members here scattered all across the country. They took a risk to do this and I should say thank you to them. At the beginning, they knew that this could be nothing more than a \$20k post on the internet that could have agreed with some of the folks that were quick to discount the PS-22 and I am glad to say that its not. I titled this thread PART 1 because there is more to this story regarding the PS-22 project and I will post Part 2 here soon. I have a lot of pictures that are a part of this post and I will add them this week when I get them off my server. Sorry for the long write up but the project was too big and technical to scale down to normal post length. I hope this answers most of the question regarding the PS-22. If anyone has a question that I did not cover please ask. If anyone objects to what I have posted I invite them to purchase the number of systems we did, invest the time we did and come to their own conclusions rather than posting more internet fodder in the future. I also invite anyone with any other real supported data (good or bad) to please contact me so I can post it here.