

CHAPTER 12 SIGHT ACCESSORIES

After looking at rearsights themselves, now it's time to examine all the goodies that you can add on to them to improve your sight picture.

A brief look at the market reveals that there are a thousand-and-one things which you could screw into your rearsight, the question is: which ones are going to do you any good?

Looking through a pinhole should be sufficient to give you a good sight picture, but those of you with tired old eyes are at a disadvantage, and anyone who shoots outdoors may need something to combat the ever-changing light conditions.

So is there anything you can do to give you some form of adjustment to the pinhole which would assist your eyesight *and* cope with the changes in light?

You could increase or decrease the size of the pinhole aperture - just like the iris in your eyes; that changes for a variety of reasons, but it does so primarily to accommodate changes in light levels.

Of course, your eyes work automatically, but if you're looking for something that can be adjusted when you need assistance, it's reasonable to assume that, as the light level goes down so you need to increase the size of the aperture to let in more light.

Unfortunately life is never that straightforward, and increasing or decreasing the size of a pinhole does more than alter the amount of light reaching your eye: it will also change the depth of focus, or the range over which your eye will focus. A smaller aperture increases the depth of focus and a larger one decreases it, just like the aperture in a camera.

Many years ago *Parker-Hale* brought out a wonderful little gadget which consisted of a normal eyepiece with a disc inside containing six different-sized holes arranged in a circle, so you could click each hole around into the sight line.

These are still in use today, but have rather been superseded by the continental system of having an adjustable iris, similar to that found in a camera.

This has an advantage over the six-hole eyepiece in that it can't get out of alignment while adjustments are being made, whereas if you don't turn the *Parker-Hale* disc quite far enough you could end up with your sights being misaligned. This isn't a problem if you have time to sight in again, but could be disastrous if you're halfway through a match card.

The standard rearsight aperture sold with most European rifles is 1.1mm; that precise size has not been chosen at random, it's the result of numerous experiments to determine the best all-round aperture to produce the smallest groups.

So, why should you need to alter this size at all?

Well, as mentioned earlier, you know that the sights actually act as an optical instrument; if you're sceptical about this, try looking at the target and ringing it with the foresight without using the rearsight, and see what sort of sight picture you get. You'll find that you see it much better when the rearsight aperture is included in the combination.

Now, supposing that you've had a hard day at the office but there are indoor league cards to be shot that night. You may start off OK but gradually you notice the sight picture starting to deteriorate and you're struggling to focus. Then 'nines' start creeping onto the card and before you know where you are you've had a disaster, produced a rotten score, and you go home wishing you hadn't bothered.

How did that night differ from other nights when you had a good shoot? It could have been because your eyes were tired as a result of excessive paperwork, looking at a computer screen all day, poor office lighting or even sheer physical exhaustion. It's an old (but true) saying - "if you can't see it you can't hit it".

The first things to suffer when you get tired are your eyes. Muscles operate the lens in your eyes, so if you've been working those muscles hard all day, they'll be tired by the time you come to shoot in the evening. Then you ask your eye to focus on something four feet away, i.e. your foresight, when it would much rather focus on the target 25 yards away because that's easier.

As a consequence, your eye hunts up and down between the target and foresight, without really focussing on either, and then the sight picture begins to deteriorate.

It's also possible that you may have a problem with your eyesight which manifests itself when you shoot, but goes unnoticed in your normal everyday life. Eyesight problems and their correction will be discussed in a separate chapter, but just for the moment, let's assume that your eyesight is basically sound.

So, what you need is something to help your eye focus on what you want it to - the foresight - and this is where an adjustable iris in the rearsight might help.

If you're shooting indoors, you may have dim range lighting, but it's not going to vary from week to week, so you're unlikely to need to adjust your iris for changing light conditions. Where you're more likely to gain benefit is having the ability to adjust the depth of focus slightly by altering the size of the aperture.

The modern adjustable irises usually have an adjustment range from about 0.8mm to 2.00mm; as you reduce the size so the picture gets darker but the depth of focus increases, and this may be sufficient to help your eyes focus on the all-important foresight.

Too small an aperture may distort the picture because of light refraction around the edge of the hole, so anything less than 0.8mm could have a disastrous effect on your average. By the same token, it's vital that you only look through the centre of the iris because of the distortion in the sight picture at the edge of the hole.

One thing to remember with an adjustable iris is that you need a size to use as your bench mark, i.e. start with 1.1mm, go up or down as necessary, and re-set it back to the 1.1mm when you've finished your evening's shooting. Otherwise you may be continuously trying to reduce the size and eventually run out of adjustment.

It is unlikely that you'll need to adjust the size of an iris much outside the range of 0.9mm to 1.3mm and the actual adjustments are likely to be very small; if you need an aperture bigger than 1.3mm to see the target clearly, there's a possibility that there's not enough light available in your range.

Adjustable irises are extremely delicate instruments; they work by moving a series of interconnecting leaves arranged in a circle. Consequently they're prone to damage by neglect and the intrusion of dust and dirt, but even worse is the damage caused by ham-fisted cleaning, so be careful! Try looking in camera shops for sight-cleaning equipment - anything used to clean something as delicate as a camera should be all right on your sights.

The next things to consider are filters, i.e. those little bits of coloured glass that some people use within their sighting system in the hope that it will improve their sight picture.

The big question is, of course: "why use a filter at all?" There are several answers to that question.



Adjustable iris and coloured filters

Firstly, a filter can improve the contrast on the target and make it easier on the eye.

Secondly, it can cut down the glare from a brightly-lit target, either caused by sunlight or by indoor target lighting.

Thirdly, on a dull day outdoors a yellow filter can appear to brighten things up.

Fourthly, it's something else to twiddle.

So let's look at the first reason in more detail: there's an old saying that "any filter is better than no filter", but which one actually suits you best is a matter of personal preference.

Some colours are recommended over others, and the one which should be put at the top of your list is yellow. The reason for this is that the human eye is at its most efficient at the exact wavelength of yellow light, so by using a yellow filter you are actually helping your eye. This may also help to explain why a yellow filter appears to brighten things up a bit.

No particular filter will actually *increase* the amount of available light, because you lose a percentage of the light reaching the eye at every glass-to-air surface. The amount lost is between 3% and 4% and it is cumulative, i.e. at the first surface only 97% of light gets through, then at the next surface 97% of *that* light gets through, and so on.

So, most filters are designed to be used when the light is too bright, which all seems fairly logical and explains the second reason for having a filter.

As most outdoor smallbore ranges in this country face north, most outdoor shooters are going to have the sun behind them; consequently, there may be considerable glare from the white of a target card. This is where a grey filter could come in handy as it will cut down the glare and improve the contrast on the target.

There are other colours which could be used: a lot of people often used a brown filter and some people like a green one but the colours to be *avoided* are blue and red.

The reason for this is that blue filters don't reduce any of the ultra-violet light rays which emanate from the spectrum and red filters don't reduce any of the infra red light rays. As they reach the eye these particular rays contribute to a blurring of the image on the retina.

The neutral browns, greens and yellows in the middle of the spectrum absorb *all* the infra red and ultra-violet rays and, although grey filters don't actually absorb any of these rays, they do at least reduce the overall glare back from the target in bright sunlight and so are well worth keeping in mind.

Therefore, if you're choosing a filter set to screw into your rearsight, go for two different shades of grey - one for bright sunny days and one for extremely bright sunny days - then a yellow for dull, cloudy days, with a brown and possibly a green just for a change.

When things occasionally seem to be drifting into mediocrity during a shoot, a change of filter can sharpen things up; at least if you have a combination of colours you have the chance to choose a sight picture which suits you on that particular occasion.

All of which, of course, brings me to the fourth reason for having a filter. It isn't 'just something to fiddle with', it's being able to cope with all the changes in light which you're likely to encounter shooting outdoors.

If you only shoot indoors on the same range all the time, rather than going for an expensive variable filter set, you could go for a single colour filter glass which would fit into a rubber eyecup.

Up till now we have only considered the basic adjustable iris and filters but there are many more things you can add to your rearsight.

Those of you who were once boy scouts probably remember the motto "be prepared" and the one thing the average British rifle shooter needs to be prepared for is the British weather.

The climate in this country involves a great deal of light changes as well as atmospheric conditions, and anything which you can add to your sights to help you cope with these changes must be an advantage.

Be warned though, it's very tempting to adorn your rifle with all sorts of goodies until it looks like some sort of metallic Christmas tree, particularly when the manufacturers keep bringing out new gadgets to play with.

But are any of them any good? No manufacturer is going to produce goods which nobody wants, and sharp manufacturers listen to what the shooters want, so if a particular accessory is being made by a large manufacturer, there must be a demand. No large company is going to invest money in a product which won't sell, so if a product is on the market, somebody somewhere wants it, and perhaps you do too.

The first gadget to spring to mind is a polarising filter which can be added to, or used instead of, the colour filters. Most people are familiar with *Polaroid* sunglasses and are aware of the way in which they cut down on the glare, so anyone who's bothered by light glaring through their sights, must be attracted by the idea of a polarising filter.



Iris, coloured filters and a polarisation filter

Most of the polarising filters that are available for rearsights are adjustable, i.e. the amount of light they let through can be varied. They usually consist of two circular or semi-circular polarised filters - one behind the other - one of which (or sometimes both of which) may have a lever attached so that they can be turned independently of each other. Turning one at 90 degrees to the other will considerably darken or brighten the image.

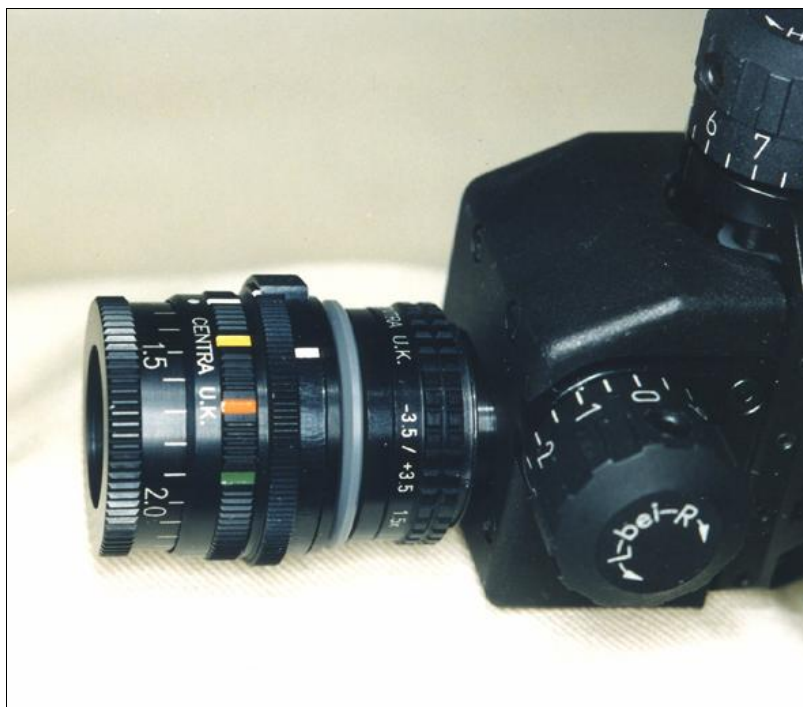
If you use this type of filter with a normal 5-colour filter set, it will give you an infinitely variable choice of polarised colours, which should be more than enough to cope with any light combinations that Mother Nature can throw at you.

There's no substitute for having perfect eyesight, but for those people who fall short of this ideal, then there are attachments which *may* help; in particular there's a device marketed by *Centra*, *Gehmann*, and possibly other manufacturers, which is a magnifying diopter.

This comes as part of some of their filter and iris sets, and magnifies the sight picture by up to one-and-a-half times. That in itself is a help, but what it also does is enable you to change the focus, which can be an enormous advantage when it comes to trying to get your eye to focus on the foresight.

However, one thing it doesn't do is correct any eye defects, so you'll need to get your eyes checked first, but if you do have difficulty with your eye hunting up and down the range between the target and your foresight, you might find this gadget an advantage.

Under N.S.R.A. rules a 1.5x magnifying diopter is allowed, so you need have no fear of being accused of cheating, and because the target is enlarged 1.5 times, it will appear to be only 70 yards away instead of 100 and will therefore seem much bigger. How can you miss?



Iris, coloured filters, polariser and magnifying diopter

It should be borne in mind, however, that a magnifying diopter is *not* permitted under the U.I.T. rules, but, as mentioned earlier, these are for international competitions and don't affect the majority of club shooters.

Before you dash off down to your local gun shop for this magic, point-winning piece of equipment, be warned that, in shooting you never get something for nothing. If using this piece of kit guaranteed an improvement, everybody would be using one, but they're not, so there are possible problems to consider.

Lots of people have tried these diopters but not everybody finds them beneficial. That could be because, in order to magnify and adjust the focus, you need two lenses, and they have to be curved, so there's a risk that light could reach the eye from somewhere else other than through the exact centre of the lens, which could lead to distortion. This means that careless head placement can result in an '8'.

You have to be prepared for some losses to offset the benefits of using these multi-filter and lens sets, and the main disadvantage arises from the fact that, the more glass you put between your eye and the target, the more the light struggles to get through, and the more it could get diverted from its true path.

Luckily the losses are small in relation to the gains, but you must be prepared to keep all lenses and filters clean; you can't afford to allow even a small speck of dust to rest on your lens as this may distort your sight picture.

A word of warning, however, about throwing your filter sets into the washing machine - they don't like it!

Despite the *Centra* and *Gehmann* design features which tend to keep the innards of these filter sets, etc. clean, you may find after several years that they require some serious cleaning. If you *must* take one apart yourself, do so with extreme care.

The filters inside are very small and are loose in their recesses, so they delight in dropping to the floor and burying themselves in the carpet. The sets also contain a series of cogs and wheels which have to be disassembled and re-assembled in the correct order. You have been warned!

However, if you don't feel confident about tackling the job yourself, the manufacturers will completely overhaul and service any of their sights at a reasonable cost (compared with the cost of a new sight). Any good target shooting shop should be able to send it off for you, or you can contact the manufacturers direct.

You may feel that, to achieve the ultimate in versatility you want to fit all these goodies to your rearsight; by all means try them, but you could find that the increase in length reduces your eye relief considerably, and moving your rearsight far enough forward to compensate for this could interfere with the loading port on your rifle.

However, don't despair, you can shorten the clamping bars of the sight with the careful use of a hacksaw; in fact you actually only need one clamping screw on a typical *Anschutz* rearsight (the *Walther* rearsight only has one anyway). It's far better to have the right filter combination and eye relief than to worry about losing a clamping screw.

Some people find it necessary to fit anti-glare tubes to their rearsights, and if you find you're having a problem with too much extraneous light coming through the aperture, you'll find an anti-glare tube will help.

The idea is to fit a tube to the front of the rearsight so that only light from directly in front of the rifle reaches the eye. Most tubes are usually fairly small (approx. 18mm diameter) and have a rough or corrugated surface inside to stop any light being reflected off the inside of the tube.

Some anti-glare tubes have become quite sophisticated now, instead of just being a plain tube; *Gehmann*, for example, have produced a couple of tubes with novel features.

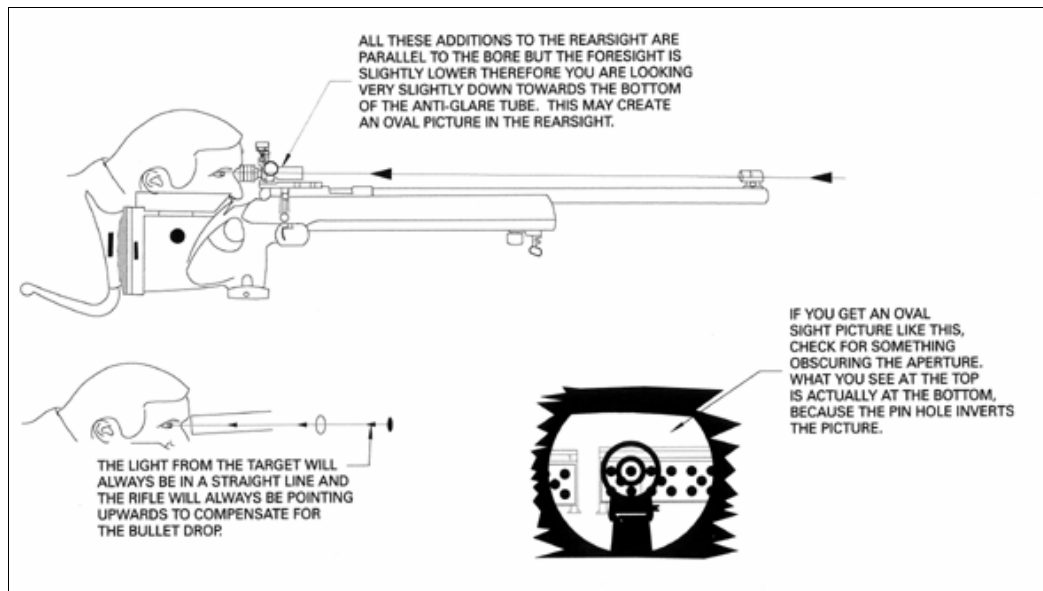
One has a built-in polarising filter, the other has an adjustable iris at the front end which is not intended to replace the iris in the rearsight, but is designed to cut down even more light. In fact, you can shut it down far enough to exclude any light, other than that coming from the target.

However, these anti-glare tubes do *not* turn your rearsight into a tube sight. The difference is that a tube sight is hinged at the front end, so as you raise the rearsight the front of the tube stays where it is. The latest *Walther* rearsight is, in fact, a tube sight, whereas the latest *Anschutz* model is a standard sight with an integral anti-glare tube.

A note of warning: adding all these tubes and things *may* interfere with your sight picture.

Firstly, it's fairly obvious that the centre of the foresight must be nearer the centre of the barrel than the rearsight, otherwise your bullets wouldn't reach 100 yards. Therefore when you look through your rearsight at the foresight, you're looking downhill very slightly.

If you're looking through a long tube at something which isn't exactly on the same centreline, it's possible for the bottom of the tube to interfere with your sight picture, and you may get an oval aperture.



Too much of a good thing

If you prefer to shoot with everything symmetrical, having an egg-shaped rear aperture is not going to be your cup of tea, but whether or not you get this effect does depend to a certain extent on the eye relief you prefer. If you shoot with a very short eye relief, obviously you have a greater field of view and this is when you may get interference.

If you've fitted an iris and filter set with a magnifying diopter at the back of your rearsight, and an anti-glare tube at the front, all that equipment is parallel to the centreline of the bore. The iris is usually the part nearest to the eye, so it's possible for the bottom of the front anti-glare tube to interfere with the sight picture.

Don't panic! Providing the anti-glare tube isn't too small, and the sights aren't bent the wrong way, most people won't be affected and, obviously, if the problem is going to occur it will be when the sights are set at 100 yards, i.e. at their highest.

Some people, rather than give up any of their accoutrements or change their eye relief, have actually bent their rearsight so that it leans forward very slightly to counteract the problem.

Some people have shot with an egg-shaped rear aperture without realising it, simply assuming that it was normal and that everybody else did it as well.

Because we're all individuals who see things differently, there's no such thing as a set of exact specifications laying out what we must see in order to get a perfect score, and sometimes we have the ability to shoot a good score with a less than perfect sight picture. This is what makes rifle shooting so exciting and challenging.

Don't be afraid to try some or all of these accessories; they're not produced without a great deal of thought, and there might just be something on the market that helps you cure a problem you didn't know you had.

There's always the possibility that by experimenting you'll hit upon the right combination for you, so don't ever accept that you're shooting as well as you're able - there's always something which could improve your score, all *you* have to do is find it.