

CHAPTER 16

MECHANICAL TOYS TO AID SHOOTING IN THE WIND

After all the thoughts on wind and how to shoot in it, now is the time to consider any possible mechanical aids which might help, rather than having to rely solely on wind flags. There have been several on the market over the years - some help, others don't. To evaluate the benefits you have to understand how they work and whether they'll work for your style of shooting.

The problem with relying on wind flags is that a lot of people are unable to see them through the rearsight - they tend to be off at an angle, away from the sight line and the bullet's path. This means you end up looking across at a flag, then back to the sights, possibly several times before releasing a shot in a twitchy fishtailing wind.

If your hold's good it may not matter if you release a shot while not looking through your sights, but obviously it would be better if you could actually have your chosen wind flag within your central vision.

Most people have 180-degree peripheral vision, but the core of your central vision is very small - about 5 degrees - therefore while you might pick up the flicker of a change in a wind flag, you still have to look directly at the flag to measure its position.

The closer an object gets to your central vision, the easier it is to see it; therefore being able to see wind flags alongside your sight line is probably an advantage - 'probably' because not everyone will react the same way; for example, some people may find that flags fluttering so close to their sight line cause a distraction.

People often remark that they've shot well while being able to see a wind flag in their foresight; some people have even shot with a flag fluttering across their target, only releasing a shot when they could actually see the aiming mark! That's not something to be recommended but it does indicate that being able to see a wind flag through your sights may be of some use.

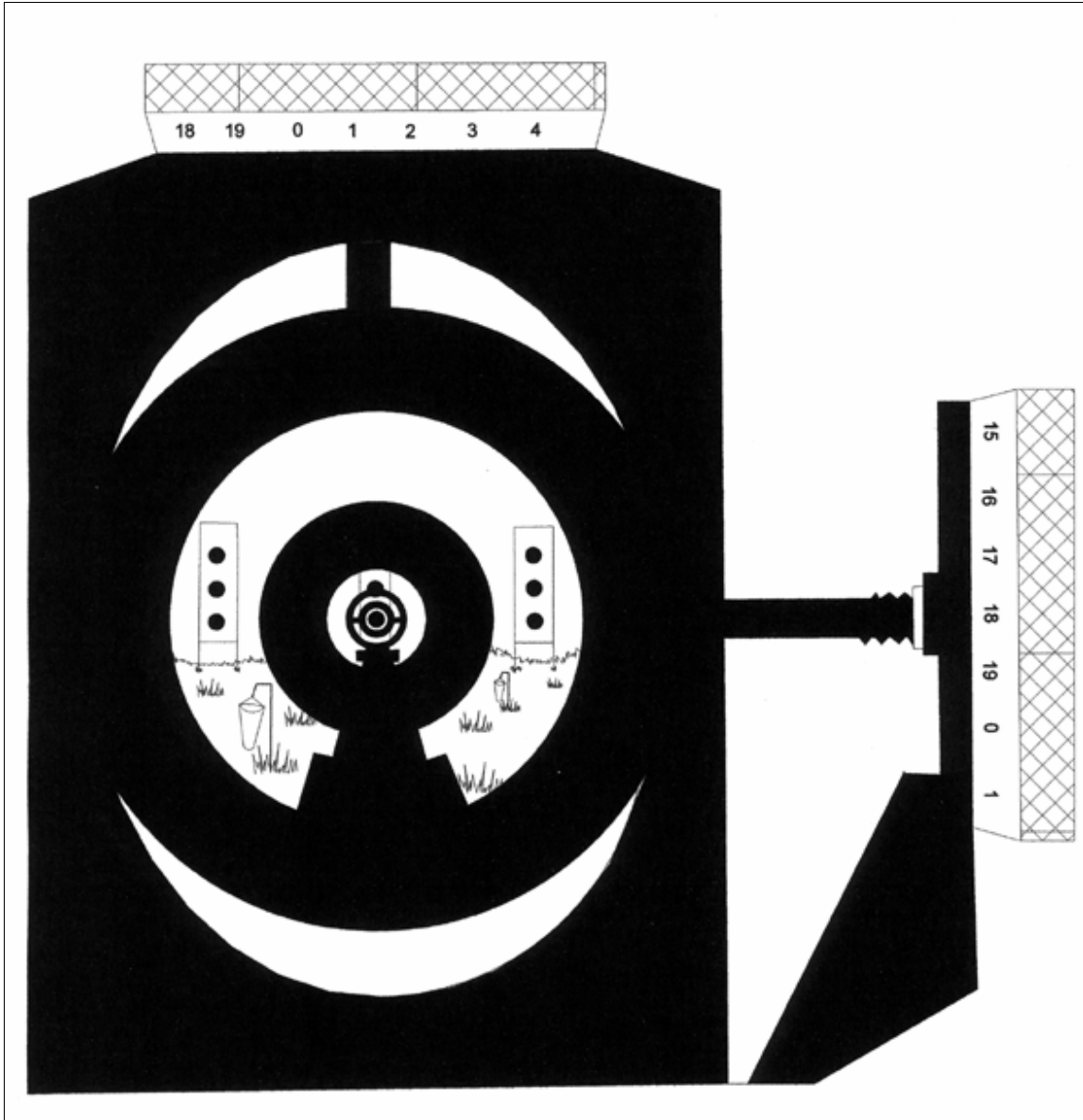


The *Gehmann* wind sight

The *Gehmann* wind sight may look fairly straightforward from the outside but actually using it requires a very different technique. The sketch below shows the view through the sight; the diameter of the ring can be adjusted by twisting the back half of the anti-glare tube, and there's a built-in polariser, which can lighten or darken the area around the ring by adjusting the front half of the anti-glare tube.

The actual ring itself is a tube, making it adjustable like the *Gehmann* foresights, so accurate head placement is essential; if the eye is off-centre the ring will distort and become oval.

Some people may find that the movement of point of impact of this sight is a little too coarse for their liking; it moves between 3mm and 3.5mm at 50 metres, compared with the old *Anschutz* sights which move 2.5mm, and the new ones which move 1.0mm; however, this needn't cause a problem, provided there's no backlash in the sights.



The view through a *Gehmann* wind sight

There's no provision for attaching coloured filters to reduce glare, but included with the sight is an adaptor which would allow you to fit a polariser and/or filter set; however, this would really negate the whole purpose of the sight because it restricts the view to a normal sight picture.

Shooting with this sort of sight will allow you to see wind indicators much nearer to the path of your bullet, and not having to look off to one side so much will help. The sight soon shows you if your head's not central because the back ring goes a peculiar shape, which is quite noticeable.

It will also help you decide whether the flag is pointing directly at you or away from you, something which can be a problem when you're looking at flags out of the corner of your eye.

However, before investing your hard-earned wages, try finding out if any of your club members have one and, if so, how they get on with it; if you're really lucky they may even let you have a go to see how you get on.

The next item which springs to mind is a specialist wind flag. At first glance this may appear inappropriate as personal wind indicators are not allowed in open competitions. However, if you aspire to the dizzy heights of shooting for your country, you may have to shoot under UIT rules, which dictate exactly the size and weight of the wind flags, as well as their location on the range.

If your home range doesn't have UIT wind flags (and very few do), it might be worthwhile getting the specification, making some up and practising reading them in various wind conditions. This is a fairly simply and inexpensive exercise which could help you cope on the big day.

Similarly, making up some windsocks like the ones used by the N.S.R.A., and practising with them beforehand could make all the difference when shooting the Bisley or Scottish national meetings.

As far as club and postal competitions are concerned, the N.S.R.A. rules don't specify what sort of flag should be used, so think about all the possibilities and design a flag which best suits you and your range conditions.

You may find that you pick out some colours easier than others, so experimenting with different colours may help you read the flags better. It's sometimes difficult to decide whether a flag is blowing away from you or towards you, particularly when you're only using one eye, but a two-tone flag could offer a change of colour when there's a change in wind direction.

In America, the bench rest shooters who rely heavily on their ability to read the wind, use a great variety of wind flags (including plastic windmills or swinging pendulums) to indicate wind speed; that may be going too far, but do keep an open mind. Experimenting loses you nothing, and much could be gained by having a wind flag which reliably and accurately allows you to read the wind's effect on a bullet.

The next possible aid to come up for consideration is the extension tube which fits over the muzzle, often referred to as a 'still air tube'. The theory is that the most critical time in a bullet's flight is when it clears the muzzle and is trying to stabilise itself in the first few inches of flight. By extending the muzzle using a larger diameter it's suggested that the bullet is provided with an area of still air in which to stabilise, so that by the time it meets the wind outside the tube it will be stable and less likely to be thrown off course.

It's a theory which must be worth closer examination, so let's take a look at what happens at the muzzle.

While travelling down the barrel, the bullet achieves its maximum velocity of 1000-1100 f.p.s. before it reaches the end. In front of the bullet is a volume of compressed air; it's difficult to determine its size or pressure, but it must be there because air is so easy to compress, and as the bullet accelerates from zero to its maximum velocity in a matter of about 15 inches, it can't possibly push the air out in front of it without compressing it to some extent.

Therefore, the first thing to exit the barrel is a cylindrical volume of compressed air (which contains all the powder residue from the previous bullet) travelling at around 1100 f.p.s. Immediately this air exits the confines of the barrel it expands in all directions until it meets the confines of the tube, when its further expansion is restricted. This effect is going to be slight because the internal volume of the tube is approximately 3.5 times the volume of the barrel, but it's still there.

The next thing to exit the barrel is the bullet travelling at the same velocity as the compressed air, and that will send a shock wave reverberating out into the tube.

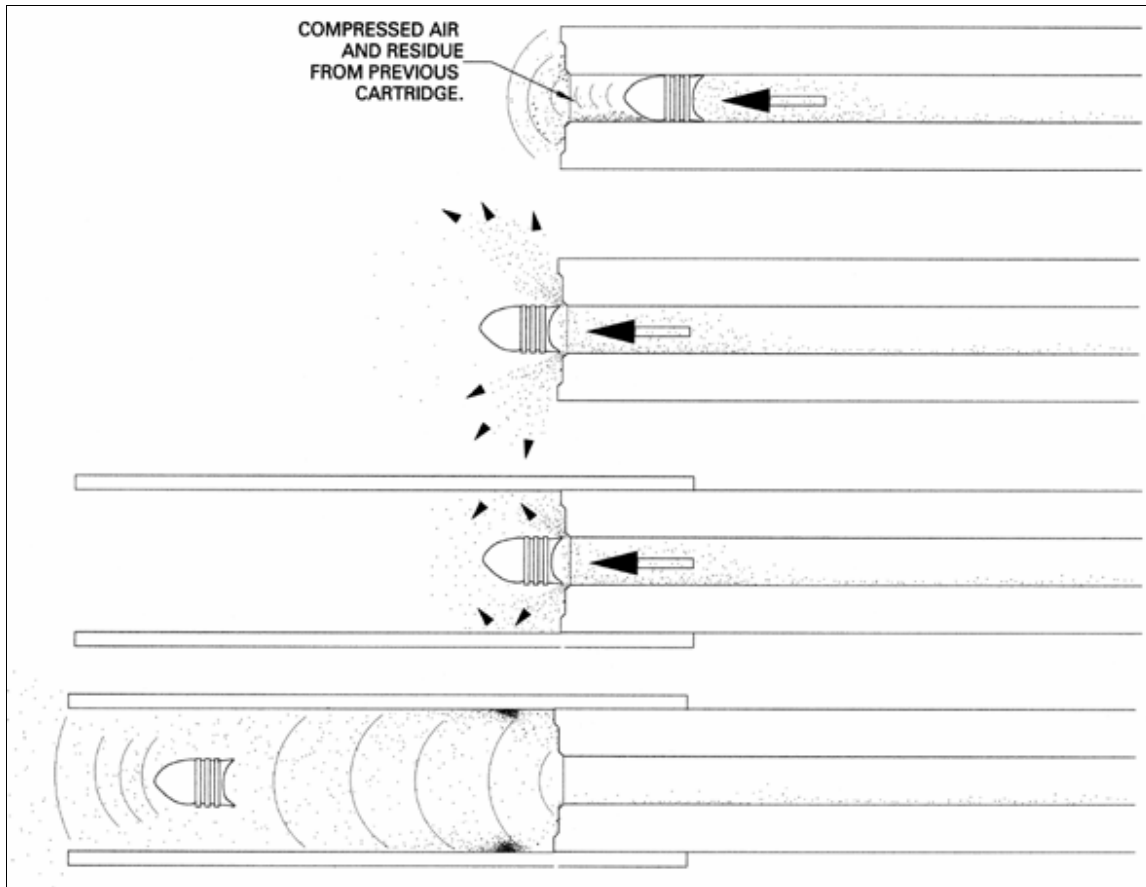
Following close on the heels of the bullet comes a blast of hot gas, and numerous particles which have resulted from the burning of the powder and priming compound in the cartridge case.

The moment the bullet clears the muzzle, it releases the high-pressure gas (which could be at 12,000 p.s.i.) travelling behind it. Because it's lighter than the bullet, it accelerates past it and expands in all directions until it meets the confines of the tube.

Its further expansion is directed down the tube, in front of, and around, the bullet, moving along at its comparatively low velocity of 1100 f.p.s. and slowing down all the time (see the diagrams below).

Because the gases contain solid particles, these will be flying towards the inside walls of the tube; most of them will have enough force to stick to the inside, but some may not, and these will be directed back into the path of the bullet. The tube walls will gradually build up a coating of residue from every bullet fired, without the benefit of the cleaning process which goes on inside the barrel (where every bullet clears out what the previous bullet left behind).

The build-up of residue inside the tube *could* be thicker at the back, (although that may not necessarily be the case) but what *is* certain is that it varies with each shot, which is not at all desirable, and which makes a case for regular cleaning of the tube.



A maelstrom of hot turbulent gases surround the bullet in a tube

So, far from the bullet being launched into still air, it is in fact being launched into a maelstrom of turbulent gases and particles, all trying to get past it and out into the open air.

Knowing that ammunition manufacturers test their ammunition by firing it down a tunnel, perhaps the theory is that the tube acts like a small tunnel; however, it would need to be considerably larger than the barrel, in fact it needs to be large enough to allow the gases to expand away from the bullet without being redirected back into its path.

If we examine what happens at the muzzle *without* a tube extension, it's fairly obvious that all the same things still come out of the barrel, but they're expanding in all directions *away* from the path of the bullet and very rapidly dispersing into the atmosphere.

The gas emerging from the barrel is going to be at a pressure of anything up to 12,000 p.s.i. Compare that with a 10 m.p.h. wind exerting a pressure of 0.65 p.s.i. on the bullet and you can see that, for the first few inches of the bullet's flight, it will be cocooned in a high pressure area expanding outwards, overcoming any disruptive influence of the outside elements, and by the time the pressure from the wind is greater than the dispersing pressure from the gas, the bullet will be well on its way to becoming stable.

All this doesn't particularly prove the case for or against extension tubes; the point about this - or any accessory which you can add to your rifle - is that, if it works for you then use it, but don't just accept blindly that the latest accessory will make you shoot better.

The only real way to find out whether the still air theory works is to 'bench rest' the rifle to remove as much shooter error as possible, shooting groups with the tube and without it, using the same ammunition.

So far, the main accessories available as 'mechanical' aids to shooting in the wind have been covered.

However, there are others which play a lesser role: for example, a telescopic sight can help you to learn how to shoot in a wind. These aren't allowed in most competitions, of course, but for practice there's a lot to be learned from a scope sight. It's amazing how easy it is to aim off in a wind when you can place the crosshairs on the target, and the confidence gained by aiming off with a scope could help you gain confidence with your iron sights.

It's been suggested that some batches of ammunition may 'buck' the wind better than others. There could well be something in that, because the wind deflection formula relates to the velocity of the bullet passing through the air; therefore, as batches vary in velocity it's possible that one batch may perform better in a wind than another.

The problem is that the batch which performs best in the wind may not be the batch that produces the best group size through your particular barrel, as this is often velocity-related as well, and the two requirements may not tie up.

If you have access to a test bench, or even just a heavy table which you can rest on, this can be a tremendous aid to learning how to cope with different wind conditions. By using the table to remove shooter error you can practise reading wind flags and seeing what effects the different wind speeds and directions have on your bullets.

Usually it comes as a surprise to learn that the wind doesn't have as much effect as you think; it might be responsible for the odd 'nine', where a shot's crept out of the bull, but rarely is the wind strong enough to push a shot as far out as the '7' ring, unless you totally misread a wind reversal, or unless a gust hits the barrel just as you're releasing your shot.

To sum up, then, all these things are worth investigating; find out from fellow club members what they think, use other people's experiences to reinforce your own and, above all, remember that it's important to keep an open mind.