

## SELECTING A SPOTTING SCOPE

The purchase of a suitable spotting scope becomes the personal choice of the individual, when taking into account many features. A scope is a tool and as such should be looked after, so that it may provide many years of faithful service, but it does need to be used to justify the purchase.

A scope should also not become as status symbol that is, you should not have to spend thousands of dollars just to have the best and most expensive scope on the shooting line.

Scopes do not become obsolete, they are simply a tool with which to see details better, so it can be worthwhile to spend the money to get a "decent" quality scope one that will serve you for many years, but not at the expense that, you have spent so much on the scope that you do not dare to use it except for special occasions and when the weather is fine.

Generally the more you pay the better the scope you can expect to get.

There is a wide range of scopes currently on the market of varying price ranges and quality, and so the following is a general guide for those seeking to purchase a suitable spotting scope for archery.

Some factors you should consider when selecting a suitable spotting scope are as follows.

- § Price
- § Magnification
- § Optical distortion
- § Chromatic aberration
- § Eyepiece (Fixed or Zoom )
- § Lens/prism quality
- § Weight
- § Objective lens size
- § Body construction
- § Others
  - Water proofing
  - Nitrogen Filled
  - Fine Focus
  - Straight or Angled eyepiece
  - Mounting offset
  - Carry case options

### **SOME OPTICAL TERMS**

Exit pupil	Distance the eye can be from the eyepiece with or without eye wear being worn.
Magnification/zoom	image size increase
Objective lens	primary lens at the front of the scope
Eyepiece	the lens you look through to view the magnified image

The ideal archery spotting scope, in my opinion, ignoring the price, would possess the following features;

- § Magnification to 60X, preferably zoom
- § Low optical distortion
- § No noticeable chromatic aberration
- § Approximately 80mm objective lens or less
- § High impact resistant case
- § Weather proofing
- § Nitrogen filled
- § Low weight
- § Usable without removing eyewear

Nice to have

- § Micro focus
- § Angled eyepiece
- § Mounting offset so that the an angled eyepiece can be rotated to the side in which you are standing. This can be negated using a tripod tilt head.
- § Carry case, if it hasn't got one, get one, especially if the scope is one of the expensive models.

## **MAGNIFICATION**

The magnification of a scope is proportional to the size of the objective lens. That is, the larger the front lens the more magnification that can be achieved.

The larger the objective the brighter and clearer is the image.

Focal length is however increased, so the scope becomes longer

## **CHROMATIC ABERRATION**

This is the optical effect/defect where lens and prisms produces dispersion of incoming light or diffraction. As light passes through an optical medium i.e. a glass prism, the light is divided up into individual colour wavelengths producing a rainbow effect on the other side. This effect can produce a defect in optical devices called chromatic aberration. The image seen through a scope is in the form of light, thus chromatic aberration can be observed to varying degrees.

This effect is best seen when viewing contrasting colours like black and white, but can also be seen on other contrasting colours. The edges which transition into the white areas, which reflect the most light into the scope, appear not as a sharp edges but as a soft focus rainbow (diffraction of Light) of its component colours. White light is composed of equal levels of all the colours of the rainbow, so for small detail images, like arrows on a target face at longer distances metres the actual colour of the shaft, nock and vanes, could be hidden by the rainbow colouring effects, thus making it difficult to determine your arrows by colour, from other arrows in the target.

If an arrow should land near a dividing line, a black line contrasting with other lighter colours, it would be difficult to distinguish the score or whether the arrow has broken the line when looking through the scope.

For gun users chromatic aberration is not so relevant as they are only trying to identify holes that they have made in their own target face. They do not have to worry about hits from other shooters, so they can easily get away with a cheaper scope.

The better the prisms and lens's incorporated in a scope, the less chromatic aberration will be produced and it will be easier to identify your arrows and where they have hit. But this tends to mean that scopes with low chromatic aberration are also more expensive.

## **LIGHT LEVELS**

On days or at times when light levels are low, the better the lens and prisms in the scope, the more light is transmitted to the eyepiece, and so the clearer the image.

Again a large objective lens has the advantage of collecting more light than a smaller one so the image will be clearer and it will be easier to identify your arrows. We cannot turn the weather on and off, so we must be prepared for all conditions.

## **TEMPERATURE**

Sudden changes in temperature mean temperature differentials with in the scope, much like a thermos retains its internal temperature hot or cold. If the scope has moisture/water vapour with in the gas/atmospheric medium inside the scope, or it is not environmentally sealed will take in moisture. When temperature changes i.e. warm scope on a cold day will cause the moisture within to condensate on the inside lens surfaces producing fogging of the lens'. This fog/condensation disappears/dissipates as the inside of the scope approaches the external ambient temperature.

This effect is avoided by;

- a) Maintaining the scope at the external ambient temperature prior to use.
- b) Full sealing/waterproofing so that water vapour is not absorbed.
- c) Selecting a scope that is sealed and nitrogen filled, which excludes water vapour.

## **HEAT**

On hot days, heat rising from the ground distorts light received by the scope. Over long distances this can be seen along flat and wide open spaces i.e. mirages, where the light from the sky becomes reflected off the ground and appears to an observer, to be water in the distance.

No amount of money can buy a scope that can see through this thermal optical effect, however the clarity of the lens and prisms can only optimise what you see.

## **RAIN**

We shoot all day, if in that time it rains we should be prepared with a waterproof scope or at least a waterproof covering.

The more expensive scopes tend to be waterproofed and sealed from ingress of moisture, although you may find the odd less expensive scope that has been waterproofed, but you should be aware that it is probably at the expense of optical quality. So be prepared if purchasing a low-end scope, that when it rains, it is time to cover or pack away your scope.

### **WIND**

It is not unusual to see scopes blown over during freak gust of wind. Naturally if it has been consistently windy or is expected to be windy during the day make sure you take the precaution of tying or pegging your tripod down so that it resists blowing over. Your scope however, should be selected of a robust construction so as to be able to absorb/recover from such accidents.

### **BODY CONSTRUCTION**

A serious knock on the body of a metal case can leave a permanent dent this will probably not affect the optical performance of the scope, depending on the severity. On the other hand a "plastic/fibre resin" body is lighter and shock absorbent to all but the hardest impacts, however impacts beyond this threshold, may cause permanent cracks, and so if a sealed unit would be subject to moisture absorption.

Many scopes now come with some or complete rubber armour to protect the scope from knocks. Most scopes are quite robust and able to take all but the hardest knocks, but take steps and precautions to avoid such situations in case of permanent damage.

### **PRICE & PORTABILITY**

As previously discussed, the larger a scope is, the better it tends to be, but the more expensive it will be. Larger scopes have lower portability. For example it may be too large to transport with your equipment, or it is so expensive that you do not travel with it, for the fear of damaging/scratching it.

So select the scope in the size range and price range that you are prepared to use it as it should be used when you need it without carrying it around as if it were a lead weight or made of "glass".

### **PURCHASING**

Check out [www.bintel.com.au](http://www.bintel.com.au) for all the good makes from Bushnell to Leica  
Good value from Sydney CBD approximately \$100 cheaper than anything in Hobart.  
Approximately \$30 Freight but consider overnight as it take 10days road freight from Sydney.  
Or try York optical in Melbourne (More expensive)