

ARCHERY
AUSTRALIA

Archery



Insights

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In the September issue of Archery Insights I used the following photo in relation to an article on “Bow Cant Variations” by Dr James Park to demonstrate bow cant.



The photo is of Mr David Nguyen. I would like to clarify that Mr Nguyen personally and in his capacity as the YouTuber NuSensei was not associated with or responsible for the content of the article that appeared in Archery Insights. I did not intend to have any readers believe that Mr Nguyen was the source or author the article or have anyone interpret the use of Mr Nguyen image as a blatant attempt to exploit his growing popularity.

Mr Nguyen has a You Tube article on Bow Cant (Nu Sensei) that can be viewed via the following <https://www.youtube.com/watch?v=ymKNi3usBLg>

The article that appeared in the September issue was written by Dr James Park and I as editor used Mr Nguyen’s photo for the sole purpose to demonstrate bow cant.

I apologise to Mr Nguyen for using his photo without permission and meant no disrespect. I do offer my apologies to Mr Nguyen for the inappropriate use of his image and can assure him that no further images will be used in future publications.

Fiona Hyde
Archery Insights Editor

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BOARD NEWS

BOARD NEWS SNIPPETS

The Archery Australia Board and Staff hope all members and their families had an enjoyable and safe Christmas and wish everyone the all the best for the New Year

70th Anniversary

Archery Australia will be celebrating its 70th anniversary in 2018. The Archery Australia Board has decided that it would like to form a small working group of volunteers to look at ways in which we can celebrate our 70th birthday together with our members. We will be calling for interested people to volunteer to be part of this working group shortly.

Policy Changes

The Archery Australia Board recently reviewed suggested changes to the following policies and decided to accept those changes and that they will be coming into effect as soon as they are published.

The Policies were 1020 Heat Stress Policy [CLICK HERE](#) and 1026 Tournament Management Policy

These changes were improvements to the safe management of events and deal with managing high temperatures / humidity situations as well as time of high winds during Tournaments and Events.

Also 1031 QRE Policy has seen changes in regard to the recording of individual arrow values in Archers Diary from the 1/1/17. There has also been minor changes to the QRE Rounds and Event Verification Form

This will allow for these scores to be counted for ranking purposes at registered events. This

can be ideally done by the archers using IScored.today which will reduce any burden upon the event organisers.

Following the introduction of new target rounds and the removal of others a new list of Target Rounds is now available

SHOOTING IN YOUR BACKYARD

Safety is Archery Australia's highest priority. Archery Australia recommends that members use their club (or an approved tournament venue) to participate in and practice archery. Archery Australia's insurance policy only covers members who shoot at AA, RGB or club approved venues, approved events or approved programs, and the insurance does not cover you for any archery practice outside of this.

Rounds for Vet and Vet+ Women for 2017

The Archery Australia Board recently approved a motion from SQAS Motion that all Veteran and Veteran Plus Women categories who currently shoot the WA 60/1440 or WA 60/900, be provided with a commensurate reduction in distance similar to Veteran and Veteran Plus Men.

As from 1 January 2017 rounds for National and Australian Tournament Records and National Championships for Veteran and Veteran Plus Women shall be the Archery Australia 50/1440 Round

36 arrows at 50m (122cm face)
36 arrows at 40m (122cm face)
36 arrows at 30m (80cm face)
36 arrows at 20m (80cm face)

and AA 50/900

30 arrows at 50m (122cm face)
30 arrows at 40m (122cm face)
30 arrows at 30m (122cm face)

OFFICIALS COMMITTEE

JURY OF APPEAL

In the World Archery rules, Chapter 17 (Target) and Chapter 31/32 (Field) is a short chapter on Questions and Disputes. The content is found below:

17.1. Any athlete on the target butt shall refer any questions about the value of an arrow in the target face to a Judge before any arrows are drawn.

17.1.1. A mistake on the scorecard may be corrected before the arrows are drawn, provided that all the athletes on the target agree on the correction. The correction shall be witnessed and initialed by all the athletes on the target. Any other disputes concerning entries on a scorecard shall be referred to a Judge.

17.1.2. Should range equipment be defective or a target face become unreasonably worn or otherwise damaged, an athlete or Team Manager may appeal to the Judges to have the defective item replaced or remedied.

17.2. Questions concerning the conduct of the shooting or the conduct of an athlete shall be lodged with the Judges before the next stage of the competition.

17.2.1. Questions regarding any published results shall be lodged with the Judges without any undue delay, and in any event shall be lodged in time to allow corrections to be made before the prize giving.

If the Judges are not able to solve a dispute between archers, they are entitled to make an Appeal to the event's Jury of Appeal (see Chapter 19 printed below):

19.1. In the event of an athlete not being satisfied with a ruling given by the Judges, he may, except as provided for in [Article 17.1.](#) above, appeal to the Jury of Appeal according to [3.13. Jury of Appeal in «Book 2»](#). Trophies or prizes which may be affected by a dispute shall not be awarded until the Jury ruling has been given.

19.2. The decision by the Judge on the value of an arrow before the withdrawal from the target face is final.

19.3. The decision made by a Judge in the team event concerning the use of the yellow card (see [Article 15.3.1.](#)) is final.

19.4. The decision of the Jury is final it cannot be appealed.

Well, that's the Rules, but what procedures are to be followed?

Firstly, Organisers of any major event must have names of people who are going to be at the grounds during the competition and who are prepared to be part of the Jury, if needed. If the event spans several days, there may be up to 6 people needed, so that volunteers are not obliged to be there every day.

Ideally, the Jury members would have experience in archery. They may not be involved in the Organising of the Event, nor can they be a Judge at the event, as it is possible that the Appeal is against a decision made by the Organising Committee or the Tournament Judge Commission.

If an archer or Team Manager wishes to appeal a decision made by Organisers or Judges, the first step is to complete an *Intention to Appeal* form (usually available from the DoS or Chairman of Judges for the event) and lodge it with the Chairman of Judges within 5 minutes of the end of the relevant round. Registering your intention to appeal allows the Organisers to realise there may be a delay to the event and to locate the Jury members.

The actual Appeal Form must be completed within 15 minutes and handed to the CoJ with a fee (usually \$50), which is returned to the archer or Team Manager if the Appeal is upheld. The fee is to prevent random claims from dissatisfied competitors.

The Appeal must refer to the relevant Rule and state how the Rule was not followed, either by the Organisers or the Judges. The Jury's decision is binding for that particular event but does not set a precedent.

Both forms are available to archers from the Archery Australia website. [The Judges](#)

TECHNICAL & INNOVATION

Arrow wind drift in relation to arrow mass (and other factors)

It is useful to understand why our arrows drift in wind and what we might do to minimise the impact on our scores. While this is quite complicated to model accurately, a simpler model can tell us a great deal. This short paper provides that simpler model.

Assume (in order to simplify the problem, since a full calculation would be overly complicated for a short paper and a general readership) that:

1. The energy transferred from the bow to the arrow is constant.
2. The arrow takes a straight line path to the target rather than an arc.
3. The arrow velocity is constant.
4. There is a constant wind velocity at right angles to a direct line from the archer to the target.
5. The wind velocity is small compared to the arrow velocity.

(Those who want to skip the maths can go straight from here to the conclusions.)

The arrow velocity is given by: $V^2 = \frac{2E}{m}$

1 where V is the arrow velocity, E is the energy transferred to the arrow from the bow and m is the mass of the arrow.

The time of flight, t, is given by: $t = \frac{D}{V}$

2 where D is the target distance.

Hence, from equations 1 and 2: $t^2 = \frac{D^2}{V^2} = \frac{mD^2}{2E}$

3 The drag force on the arrow is given by: $F_{\text{drag}} = 0.5\rho AC_d V^2$

4 where ρ is the air density, A is the effective area of the arrow and C_d is the drag coefficient. (In practice, it is easiest to consider A and C_d for each part of the arrow rather than for the arrow as a whole).

The arrow tries to align its longitudinal axis with the resultant air flow direction. The resultant air flow direction is a combination of the arrow's velocity and the wind velocity. Consequently the angle of orientation of the arrow as it travels to the target, θ , is given by: $\tan\theta = \frac{v}{V}$

5 where v is the wind velocity.

The drift force pushing the arrow to the side, f_{drift} , is then, from equations 1, 4 and 5 (and remembering that θ is small):

$$F_{\text{drift}} = f_{\text{drag}} \times \sin(\theta) \sim 0.5\rho AC_d V^2 \frac{v}{V} = 0.5\rho AC_d \frac{2E}{m} \frac{v}{V} = \rho AC_d \frac{Ev}{mV}$$

6 The drift acceleration, using Newton's second law and equation 6 is: $a_{\text{drift}} = \frac{f_{\text{drift}}}{m} = \rho AC_d \frac{Ev}{m^2V}$

7 The drift distance, d, is then, using equations 1, 3 and 7:

TECHNICAL & INNOVATION

Arrow wind drift in relation to arrow mass (and other factors)

$$d = 0.5 a_{\text{drift}} t^2 = 0.5 \rho A C_d \frac{E v}{m^2 V 2E} \frac{m D^2}{4mV} = \frac{\rho A C_d v D^2}{4m} = \frac{\rho A C_d v D^2}{4m} (m)^{0.5} = \frac{\rho A C_d v D^2}{5.6(mE)^{0.5}}$$

8 This can be checked dimensionally to help ensure it is correct:

$$9 \text{ RHS dimensions} = \frac{\text{kg}}{\text{m}^3} \times \text{m}^2 \times 1 \times \frac{\text{m}}{\text{s}} \times \text{m}^2 \times \text{s} = \text{m} = \text{LHS dimensions}$$

(Start here if you wanted to skip the maths.)

Consequently, from this simple modelling, the drift of an arrow in wind is:

- Proportional to the air density.
- Proportional to the strength of the wind (a stronger wind means more drift).
- Proportional to the effective area of the arrow (for example, more shaft surface area means more drift, that is, a smaller diameter shaft is an advantage – a smaller diameter shaft also usually has more mass, which helps as well).
- Proportional to the effective drag coefficient of the arrow (for example, better arrow and arrow component shapes could help reduce the drift).
- Proportional to the target distance squared (that is, it gets much worse at longer distances).
- Weakly inversely proportional to the energy transferred to the arrow from the bow (so a higher draw weight will reduce the wind drift a little).
- Weakly inversely proportional to the mass of the arrow (so a heavier arrow of the same outside dimensions will give a small reduction in wind drift).

We do need to think about the impact of the above assumptions:

1. A more massive arrow does extract a little more energy from the bow. This means that a heavier arrow is a little more advantageous than shown above.
2. As the arrow gets heavier its path to the target gets longer (it has to travel on a higher arc). This means that a heavier arrow is a little less advantageous than shown above.
3. The arrow does slow down as it travels towards the target. This means that an arrow with low drag has an additional small advantage over an arrow with higher drag. That is, a smaller diameter arrow has an additional advantage.
4. Wind is generally gusty and from varying angles. The case above should be the worst, so drift will be a little less.
5. Most of the wind velocities are indeed small compared to the arrow velocities. The drift will be a little more than calculated above for stronger winds.

Hence, in general the assumptions are reasonable.

I have modelled these aspects of arrow behaviour in much greater detail, and removing all of those assumptions (and a few others) for both recurve and compound bows and for many arrow types in some of my other work, but that is too complicated to show here. Nevertheless the above results are reasonably representative of actual arrow behaviour.

Dr James Park
Chairman, Technology and Innovation Committee

CLUB NEWS

2017 AUSTRALIAN OPEN



Friday 3rd to Sunday 5th March, 2017, at Samford Valley Target Archers, Samford, Queensland.

The Samford Valley Target Archers invite you to Samford Valley to enjoy the competition amongst, and the companionship with, archers from all around Australia.

We are aiming to at least equal the success of the 2016 Australian Open, but are planning to improve on the performance.

The Club's grounds are located in the picturesque rural setting of Samford Valley. Samford is a village to the north west of Brisbane, and about 40 minutes from the Brisbane CBD. The club now boasts in excess of 250 members, who have 4 hectares of well-maintained grounds on which to shoot, and a 30 lane indoor facility.

In addition, the Archery Alliance of Australia will hold the Archery Hall of Fame dinner for 2017, at the Gaythorne RSL Club, 534 Samford Road, Mitchelton, Queensland on Saturday 4th March 2017.

Three archers will be inducted into the Archery Hall of Fame.

More information on this is available on the Archery Australia website, or by contacting Eric Creighton on 07 3256 3976.

We hope you can plan ahead and participate, and perhaps even stay for a short holiday in Queensland, as it should be a perfect time of the year. The Moreton Bay Region immediately to the north of Brisbane is a delightful location in which to stay and enjoy a few days exploring, www.moretonbay.qld.gov.au We look forward to seeing you on the line in March 2017 for this most prestigious and friendly event. More information has been placed on the club's web site www.samfordarchery.org

Early bookings are recommended – for the 2016 Open there were in excess of 120 archers on the line.



DIARY DATES

DATES AND EVENT REMINDERS



2017

- Australia Open - Brisbane, Queensland - 3-5 March
- Australian Field Open - Tuggeranong, ACT - 11 -12 March 2017
- Para and VI National Championships , Tuggeranong, ACT - 24-26 March 2017
- National Crossbow Championships - Adelaide ,SA - 2-9 April 2017
- National Youth Archery Championships - Morwell , Victoria 8-13 April 2017
- National Matchplay Final—TBA - May 2017
- National Indoor - Various locations - 22-23 July 2017

2018

- National Championships - Perth, Western Australia - 28 Oct - 1 Nov 2018
- National Youth Archery Championships - Morwell , Victoria
- Trans Tasman - Australia - Host to be determined
Para and VI Championships - Tuggeranong, ACT
- National Crossbow Championships - Host to be determined
- Australian Field Open - Tuggeranong, ACT
Australian Open - Perth, Western Australia
- National Indoor - Various locations
- National Championships - Host to be determined

2017 INTERNATIONAL EVENTS

- World Crossbow Championships - Adelaide, South Australia 2 to 9 April 2017
- World Masters Games - Auckland, New Zealand 21 to 30 April 2017
- World Cup - Shanghai, China 2 to 7 May 2017
- World Cup - Antalya, Turkey 6 to 11 June 2017
- World Cup - Salt Lake City, USA 20 to 25 June 2017
- World Cup - Berlin, Germany 8 to 13 August 2017
- World Games - Wroclaw, Poland 3 to 13 August 2017
- Summer Universade—Taipei, Chinese Taipei 19 to 30 August 2017
- World Para and VI Archery Championships - Beijing, China 12 to 17 September 2017
- World Target Archery Championships - Mexico City, Mexico 1 to 8 October 2017
- World Youth Archery Championships - Buenos Aires, Argentina 15 to 22 October 2017

Archery Australia are seeking Expression's of Interest to host a number of National Championships which are yet to be allocated.

Interested parties should contact the Archery Australia Office at info@archery.org.au for an information pack.