

## *Camber vs Rocker*

### **Introduction**

*Snowsports Industries America* reported that snowboard equipment sales for the month of February 2010 declined 7% in units and 4% in dollars, coupled with increases in carryover sales while most current season snowboard equipment sales have declined – except for rocker boards. Rocker snowboard sales have doubled since last season from 20,070 to 43,772 boards sold<sup>1</sup>.

Since 2007 this new rocker shape of snowboard has been making serious inroads into a market that was previously totally dominated by boards with a ubiquitous camber shape<sup>2</sup>. Back then it was perhaps possible to label the new rocker (or reverse-camber) design as a fad or marketing ploy, but no longer. In 2010 rocker boards have become an integral part of the snowboard market with all of the major companies (except [Bataleon](#)) offering reverse-camber

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<sup>1</sup> <http://business.transworld.net/34536/news/sia-reports-rocker-boards-helmet-sales-up-for-february/>

<sup>2</sup> [http://snowboardguru.blogspot.com/2010\\_04\\_01\\_archive.html](http://snowboardguru.blogspot.com/2010_04_01_archive.html)

boards<sup>1</sup>. Furthermore, traditional camber boards seem to be losing popularity fast: 4 of the top 5 selling boards this season are rocker boards<sup>2</sup>.

What does this amount to for the snowboard instructor? What do instructors need to know about these new boards? Should we encourage beginners to use a rocker board? What advice should we give to intermediates? Does our teaching need to change at all? This paper will attempt to answer these questions by comparing and contrasting camber and rocker boards from an instructor's point of view. They have been assessed across the central theme, intermediate riding, freestyle, powder and high performance piste riding. The aim is to evaluate how the boards ride in the different scenarios, not heeding the advertisement jargon and marketing hyperbole, but looking at the instructor's concerns and investigating how technical inputs and outputs might differ and how teaching focuses might need to change depending on the client's board. As there is an array of design variations and rocker/camber blends, this paper will take the archetypal rocker and camber templates (see glossary) as its subject matter.

## Central Theme

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<sup>1</sup> <http://www.documentsnowboard.co.uk/news/gear-news/what-to-expect-next-winter-trends-u-bends>

<sup>2</sup> <http://www.snowsports.org/SuppliersServiceProviders/Resources/PressReleases/SIAPressReleases/PressReleaseDetail/contentid/1087/>

### *Straight Running:*

Travelling in a straight line with a flat base should produce no significant difference between the two board profiles. There is no performance expected from the board other than its ability to slide. There are no technical inputs to warrant comparative outputs. The instructor's focus here is on developing good posture and balance.

### *J turns:*

Rocker boards make this exercise slightly easier. The contact point right under the front foot requires minimal movements to make it engage with the snow, meaning the board turns with little effort. However, if there is no weight on the back foot then the board will just pirouette around the front foot rather than turning. If this happens the instructor should address this by asking client to feel more weight on the back foot next time. From here there should be a careful focus on maintaining a stance with weight centrally balanced. The riders of camber boards might need to make fore movements to achieve the same result. Here, it is beneficial to focus on steering with the lower leg and knee to encourage fore movements as well as pedalling.

### *Side slipping:*

Common problems during this exercise arise from the pupil's weight being unevenly distributed along the length of the board. If their stance is not centred, pupils will often find that they veer off to one side as opposed to slipping directly down the fall line. This issue is exacerbated by rocker boards. As there is a shorter contact length to distribute their weight, the effect

(veering off to one side) of an imperfection in stance is more exaggerated. Compared to the camber board where the contact length is longer, uneven weight distribution is dissipated across a greater length, therefore having less dramatic consequences in this scenario. It could therefore be said that during this exercise the camber board provides a greater margin of error.

Another common fault is the pupil's inability to maintain an even edge angle along the length of the active edge. This is a result of the pupil not controlling the tilt of their feet evenly- one foot is less tilted than the other. This causes the board to torsionally twist and veer off to one side. Again, rocker boards compound this problem. If a pupil unintentionally causes an amount of twist in the board whilst side-slipping, the effect will be greater on the rocker board than on a camber board. This is a result of the shorter contact length providing less stability and more maneuverability, therefore requiring more precision from the rider.

#### *Diagonal side-slip:*

The focus here is on shifting weight from one foot to the other, side to side across the length of the board. Again, rocker boards will be more sensitive and require less range of movement than camber boards due to the narrower contact points, making this exercise easier to get right: A rocker... has a very loose feel. Whenever you shift your weight off of a foot, that end of the board will lift, releasing the edge from that end of the board. This is great for beginners<sup>1</sup>. Children and less athletic clients might benefit from a rocker board from this point on because it is less strenuous when the fore and aft

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<sup>1</sup> [http://snowboardguru.blogspot.com/2010\\_04\\_01\\_archive.html](http://snowboardguru.blogspot.com/2010_04_01_archive.html)

movements are confined to a shorter range.

### *Floating leaf:*

With a focus on pedalling, some clients may prefer the sensitivity of the rocker board, while others may benefit from the stability of the camber's wider contact points. For those clients on camber boards, leaning back can be a big hurdle to correct here. Once the board has swung into the fall line, fear may cause the client to shift their weight to the back leg. If this happens it is unlikely they will be able to steer the board across the slope and slow down again. For those clients on rocker boards, they may still be able to steer from this aft position, but the instructor should look out for this and try to focus on achieving a centred stance, as it will hinder technique as the rider improves.

### *Basic + Standard Turns:*

Once it comes to changing edges, the riders of camber boards might catch an edge more often: Cambered boards tend to catch edges more readily than reverse camber boards and don't offer the buttery feel associated with reverse camber boards<sup>2</sup>. Typically, this happens during the initiation phase of the turn when the rider accidentally allows the outer contact point to engage too early. The instructor must make them mindful of the area of the board that extends beyond the front foot, because this is where the contact point is located. To avoid these edge catches, focus must be placed on progressive timing of the fore and pedalling movements. An emphasis on knee steering can be helpful to achieve this. The rocker riders might improve

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<sup>2</sup> [http://www.snowboard-review.com/snowboard\\_guide/basics](http://www.snowboard-review.com/snowboard_guide/basics)

more quickly at this exercise because of their board. Since the area of board that extends beyond the front foot is bending up off the snow, they are much less liable to catch it in the same way and will therefore sustain fewer falls: Since the tip and tail are off of the ground when your weight shifts, it is almost difficult to catch an edge<sup>1</sup>. With the contact points right under the feet, minimal pedalling movements are enough to steer the board, leading many to believe that the rockers are easier to ride at this level<sup>2</sup>. Furthermore, the narrower contact points produce a tighter turning circle that makes it easier for the client to control their speed through the turns.

### **Intermediates**

If the rider learnt on a rocker they should definitely give a camber board a try and make their own mind up as to whether or not they like it. As an instructor, this train of thought should be encouraged in the clients. It is a good idea for them to be at a skill level where they can perform at least standard turns with confidence before they switch boards, as this is the basic watershed. The first thing the rider will notice is that the board feels less loose: reverse camber... boards have a 'loose' feel to them compared to one with camber<sup>1</sup>. This may be experienced in a positive or negative light depending on the rider. It feels less loose because they suddenly have more board to control on account of the wider contact points. If the rider continues to use exactly the same technical inputs on the new board, they will be

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<sup>1</sup> [http://snowboardguru.blogspot.com/2010\\_04\\_01\\_archive.html](http://snowboardguru.blogspot.com/2010_04_01_archive.html)

<sup>2</sup> <http://www.popmag.com.au/8123/tech-specs-reverse-camber-snowboards/>

<sup>1</sup> [http://snowboardguru.blogspot.com/2010\\_04\\_01\\_archive.html](http://snowboardguru.blogspot.com/2010_04_01_archive.html)

inappropriate. It may be found that the board doesn't turn as easily, and the rider falls inside the turn a lot because the board hasn't followed their body's path. The rider will be used to pedalling across to the new edge with the front foot whilst making very little fore movement. On a camber board this technique will cause too much of the new edge to engage at once, creating what would be a long drawn out carve-like turn. Since the rider will not be expecting this, their body weight will be too far inside the turn, and they will flip the board over. The instructor's major teaching focus should be on sufficient fore movement so that the rider hits the contact point of the new edge when pedalling. Once the contact point can be hit, the board will pivot into a turn of a similar radius to that which they are expecting.

Alternatively, if they have reached this stage in their riding without using a rocker they should be encouraged to give it a try so that they can decide for themselves. The rocker will feel loose in comparison to the camber board. The rider will find that the requirement of fore movement is greatly reduced and that it takes less effort to initiate basic and standard turns. This is on account of the contact points being under the feet. With just minimal pedalling movements of the front foot, the contact points will engage and initiate turns with ease. It is this that has lead rocker boards to be described as having a skateboard-like feel<sup>1</sup>, because on a skateboard the turning mechanism is below the front foot and steering occurs with a simple pedalling action. Problems are likely to be encountered after the turn has been initiated though. It is common to see the client pivoting the board under the front foot, without the tail end gripping effectively; usually a result of having too much of

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<sup>1</sup> [http://www.snowboard-review.com/snowboard\\_guide/basics](http://www.snowboard-review.com/snowboard_guide/basics)

their body weight over the nose. (Although prevalent, this issue is slightly less pronounced on a camber board because it has the extra grip at the rear provided by the camber pressing the board's tail end into the snow). To compensate for this, many riders will ride 'back seat', with their weight over the tail in order to ensure grip once the turn has been initiated. It is possible to steer a rocker from a reasonably aft position because there is still enough weight over the fore contact points to initiate a turn by pedalling alone. However, on a camber board it would be very difficult to initiate the turn from this position because the fore contact points are too far up the board for them to be controlled from the back seat. For this reason it could be justified in saying that a rocker allows the rider to get away with bad habits. Back seat riding should be discouraged at this point, as it will be detrimental to higher end riding as the client improves. The instructor's focus here should be on the client's weight distribution, giving them exercises to find the centre of the board so that they can grip with the entire edge through the turn.

## **Powder**

The camber board will float less in powder snow than the rocker. The camber shape presses the tip down into the snow making burial of the nose a common occurrence. To avoid this, many riders adopt one of 3 tactics:

- 1) They lean back, supporting the majority of the body's weight over the back leg to prevent the nose from sinking.
- 2) They change the stance settings on a day when powder snow is going to be ridden by removing the bindings and replacing them a few notches aft.

3) They ride a different board altogether on a powder day. Traditional camber powder boards are usually significantly longer than the rider's usual board in order to enhance float by increasing the board's surface area. They are also 'directional', in that they have a longer nose than tail to avoid burial of the nose.

All of these options have major downfalls. Option 1) is uncomfortable and quickly leads to muscle fatigue. It also hinders correct technical performance as insufficient fore movement can be made and steering occurs mainly from the back of the board. Options 2) and 3) can work fine as long as the rider has no desire to ride switch. The short tail will exacerbate all the problems of nose burial when being ridden backwards, thus massively hindering performance in the field of backcountry freestyle, where switch riding is as important as natural riding. This is a serious weakness as backcountry freestyle is an integral part of elite snowboarding. To cope with switch powder riding, switch landings from air rotations such as 180s 540s 900s etc, and switch take-offs, riders have traditionally ridden longer camber boards with centred stances. The problem here is that longer boards are more cumbersome and don't spin in the air as easily, leaving the rider with a compromise between maneuverability and float. Most falls in freeriding start from the nose of the board, you either go over the bars in powder or the nose gets caught under a weird crust and tosses you...Rocker eliminates most of these falls by moving your front contact point closer to your front foot and allowing you to swivel the board side to side without the tip catching on the snow surface<sup>1</sup>, Jeremy Jones.

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<sup>1</sup> <http://www.jonessnowboards.com/boards/flagship/designs>

Using a rocker board eliminates these problems. The concave profile, like the hull of a boat, encourages it to rise and plain on the surface (depicted in diagram 1 below).

QuickTime™ and a  
TIFF (Uncompressed) decompressor  
are needed to see this picture.

Diagram 1, taken from [Jones snowboarding](#)

There is no need to set back the stance or sit on the back leg to prevent the tip from burying. *The Angry Snowboarder* agrees: First and foremost anything that is anti-camber is going to give you added benefits in powder. That's a given, you just don't end up having to fight against the camber to get the nose above the snow<sup>1</sup>. The rider is therefore able to make adequate fore movements without burying the board. Furthermore, the reverse-camber boards that can provide the same float in powder are much shorter than their camber counterparts, thus improving maneuverability and agility in the air. Rocker allows a centred, freestyle friendly stance on a shorter board, providing equal float and performance when riding switch. This view is

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<sup>1</sup> <http://www.angrysnowboarder.com/?p=4461>

manifested in the new [Jones snowboarding](#)<sup>2</sup> line, a company manufacturing powder specific boards.

### **Advanced Piste**

There will be a noticeable difference between the two boards in the technical inputs employed during high performance turns such as those performed when at high speed or on steep slopes. These turns require an early edge change, and high levels of grip and drive all the way through the turn. When initiating one of these turns the rider will move fore and pedal across to the new edge, hoping to apply pressure to the new edge at a point as close to the nose as possible. It is advantageous to engage the new edge at a point as close to the nose as possible so that the board can begin to grip and initiate the next turn as soon as possible. It also means that as the turn comes to completion and the rider has moved aft, the entire effective edge has been used, from nose to tail, to grip the snow and manage the centripetal pressure. During such turns the camber board works best: Traditional camber is still the right shaping solution for a precise, competition type performance, which is why we've kept it in some key models in our line<sup>1</sup>, (Paul McGinty, [Ride](#)<sup>2</sup> Board Engineer). The shape is pushing the extremities of the effective edge into the snow, adding pressure to the nose and tail contact points. This aids massively during the initiation and completion of the turn described

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<sup>2</sup> <http://www.jonessnowboards.com/boards.aspx>

<sup>1</sup> <http://business.transworld.net/29582/snow/ride-snowboards-201011-snowboard-preview>

<sup>2</sup> <http://ridesnowboards.com>

above. When initiating the next turn, the camber helps engage the new edge right near the tip of the board, because this is where the contact point is being pushed into the snow. As the turn comes to completion, the rear contact point is being pushed into the snow, allowing the rider to achieve high levels of aft grip along the portion of edge that extends beyond the back foot towards the tail.

A rocker board does not yield as high performance with the same inputs. During turn initiation, the part of the new edge that ideally should be engaging first is bending up out of the snow. It therefore requires more fore and pedaling movements to pressurise it the same and get it to engage. Furthermore, since this part of the board is already bent up it is liable to buckle if too much force is driven through it, throwing the rider out of control. During the completion of the turn the rider is in an aft position, requiring the tail-end of the board right the way up to the rear extremity of the sidecut to be gripping. Again, due to the fact that this part of the board is bending up and away from the snow, it will grip less than the camber counterpart, which is pushing down into the snow. For this reason, the rider will be forced to perform more aft and pedaling movements to achieve the same performance outputs. If the rider fails to do this, the edge will lose grip, leading many to label reverse-camber boards as less stable at speed.

A further disparity exists between the boards when transitioning out of one turn and into the next. Whilst riding a camber board through a high performance turn, the camber shape reverses to match the arcing turn shape and stores energy like a strung bow. This means that as the turn is completed and the rider unweights the board it will rebound to its natural shape providing

a spring into the next turn. A rocker board is already bent into the shape that it forms during a turn. This means that as the board is unweighted there is significantly less rebound, making it feel less lively: you don't get the lively feel you get from a cambered board<sup>1</sup>. For this reason it is more difficult to achieve the same high performance outputs on a reverse-camber board.

## **Freestyle**

The shape of a rocker board makes it much easier to press and butter than a camber board. Much less fore or aft movement is required to lift the end of the board, as the rider is working with the flex of the board rather than against it: Rocker boards are a park lover's best friend. The rocker design requires that the boards are pre-pressed, which obviously makes pressing easier<sup>1</sup>. On a camber board the flex is working against the press, requiring a greater range of fore and aft movements, making the press or butter position more strenuous to hold. The rider of a rocker board is also at an advantage when pressing features in the park. Since less range of movement is required it is more likely that the centre of mass will stay above the base of support. The camber rider will have to move the centre of mass further to the limits to achieve the same results. This disparity becomes amplified when pressing features that are at angles, such as down rails. This is a double-edged sword though. The advantage soon becomes a disadvantage when it comes to ollies and nollies. The *Angry Snowboarder* agrees: Rockers have advantages but

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<sup>1</sup> [http://www.snowboard-review.com/snowboard\\_guide/basics](http://www.snowboard-review.com/snowboard_guide/basics)

<sup>1</sup> <http://www.snowboardgo.com/2009/12/rocker-banana-reverse-camber-wtf>

the biggest sacrifice though will be pop<sup>2</sup>. When performing such a maneuver the rider is looking to harness the natural springy flex in the board by moving fore or aft and bending the board, then using the rebound, known as 'pop', to achieve extra height when jumping. A camber board provides more pop because when it is bent into an ollie-ready position it is bent against its flex pattern, therefore storing more tension than a rocker board. A rocker board is already naturally bent in that direction and so provides much less pop as it recoils to its natural shape.

## **Conclusion**

Should we teach beginners to ride on rocker boards? The conclusion of this paper is yes. Although there are some difficulties resulting from the reduced stability of a rocker board, they are outweighed by the benefits of fewer edge catches that often plague early beginners. Snowboarding is made easier by rocker boards; therefore beginners should be on them. Anything that aids the process of learning to turn has to be a good thing since this is the goal of beginner lessons. Why draw that process out unnecessarily? It's like learning to ride a bike with stabilisers: If rocker shapes reduce the likelihood of falls due to edge catches then people will be less scared during the learning process and be able to concentrate on technique rather than worrying about their next fall.

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<sup>2</sup> <http://www.angrysnowboarder.com/?p=4461>

A common counter argument is that a rocker board may allow a rider to get away with bad habits. It is true that when a rookie rider who has only ridden rockers rides a camber board for the first time their technique may cause them to catch edges and fall a lot; but a session with an instructor could easily help them to refine their footwork, weight distribution and range of movement to solve this. If problems are encountered when transitioning to camber boards and more instruction is required, this should not be seen as a bad thing, but as a natural step in the learning process.

The official press release from the International Trade Fair for Sports Equipment and Fashion (ISPO) quotes the upsurge in rocker technology as the following:

They forgive errors and are easier to turn than ever. Thanks to negative pretension (rocker) the nose and tail of the boards are bent slightly upwards which creates more lift, makes them easier to turn and they are very forgiving, no matter whether on groomed runs, terrain, in pipe or park. Thanks to the easy riding characteristics of rockers this technology has become standards in the majority of new boards<sup>1</sup>.

Despite all the good points, instructors should be wary of singing the praises of reverse-camber too liberally as it has been shown that it has disadvantages depending on the rider's level and desired outputs. For example, the reverse-camber shape improves certain elements of freestyle, but at the expense of ollie pop this might not be a worthy sacrifice. The increased powder float of a reverse camber board might not be worth the lack

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<sup>1</sup> <http://www.documentsnowboard.co.uk/news/gear-news/what-to-expect-next-winter-trends-u-bends>

of stability at high speeds on piste. It all depends on the individual rider's needs.

The area where camber boards look like they will continue to excel is high performance piste riding. The characteristics that make it slightly less easy to turn at low speeds are precisely those characteristics that allow it to excel during higher-level riding. The increased liveliness, grip and drive will be attractive to riders of an intermediate level and above. Indeed, the kind of lively high performance edge change that is expected during BASI level 3 technical assessments is certainly possible on a rocker board but these outputs are actively facilitated by riding a board with camber.

There is no one perfect snowboard. Any board choice, whether it is rocker or camber, will be a compromise in some way. The important thing is that instructors are up to date with the latest board designs, understand their client's needs and can adjust their teaching accordingly.

## **Glossary**

### *Camber.*

Camber describes the shape of the board as seen from its side profile. When lay on a flat surface the board will rise up in the middle as long as it is not mounted. The two points where it rests on the surface are known as the contact points. The contact points are wider apart (nearer to the nose and tail) than the bindings. When the board is mounted it will be pressed flat, but the camber shape will focus pressure not just under the bindings but out to the contact points as well. See *Figure 1*.

QuickTime™ and a  
TIFF (Uncompressed) decompressor  
are needed to see this picture.

*Figure 1. A camber board's side profile when stationary, on a flat surface and dismounted.*

*Rocker / reverse-camber:*

Rocker describes the shape of a board as seen from its side profile. Also known as *reverse camber* and *anti-camber*, a rocker board will rise up from the centre when at rest on a flat surface as long as it is not mounted. When mounted the board will be pressed flat between the bindings, with most pressure focused towards the middle of the board. From the bindings out towards the nose and tail the board rises up off the surface. The contact points in this case refer to the points where the board rises up off the surface (when it is mounted) and are located under the bindings. The contact points are significantly closer together on a rocker board than on a camber board. See Figure 2.

... (snowboard) assembly  
are needed to see this picture.

*Figure 2. A reverse-camber board's side profile when stationary, on a flat surface and dismounted.*

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