

**JANUARY 2016**

### **Mistral's Windsurfing Division - The Phoenix Set to Rise**

We're back in charge of our Windsurfing Division after having been out of touch with it for some time, which permits us to hone our thoughts and our focus. But why enter the market again, with yet another design laying claims to greatness, when in fact, it's hard to quantify such claims.

Why embark on a come-back, unless we have something truly seminal and genuinely useful to present to the end-user; within an industry, which by all accounts went to sleep at the wheel some time ago. First and foremost, the end-users enjoyment and stoke has to be our primary focus and above all, our designs must have integrity in their claims.

A key area of board design which has been addressed and considered since the 1980s, concerns the notion of an adjustable degree of tail rocker, an adjustable width and even a flexible tail, all with varied end-goals from improving control, flat-line speed, smoothness of ride, speed of rising to the plane, increasing range of rider weight optimums and more besides.

From a technical standpoint, much has been written about the various offerings and arm-chair scientists are quick to offer a host of theories.

### **History Brings Mistral Full Circle**

The first flex-tail concept was invented and patented by Mike Tinkler in the 80s, known simply as the Tinkler Tail, which sparked our imaginations of what could be and why the sport needed such a system.

The patent for the Tinkler system, was subsequently acquired by Mistral, who created a production flex-tail with exchangeable tails, named the, Challenge Flex, in the late 1980s. It



featured a series of springs to cushion the ride and had a degree of adjustability and was available as an 8'8 and a 9'2.

<https://mistral.box.com/s/lrj7mwzby97vykrkf4v7dhamiaqr7ors>

Adjustable springs were located toward the rear of the flexible tail, permitting the user to apply pressure in varying degrees, to the rear rocker and thereby alter it. When set loosely, increased 'pressure' experienced during tight turns, high winds and over choppy waters,

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permitted rocker to increase. Set tight, nominal or no flex resulted in no change in rocker and a stiffer ride. The Challenge Flex Tune Up Hints or 'CF' as it was referred to, provided an extensive explanation of how the system was best optimised in relation to tightening and slackening pressure to the springs.

In 1989 Mistral stated, 'When we refer to our boards as high tech equipment, we are talking about the ultimate union of advanced construction systems and sophisticated design technology. When the two are put together, it's called the Challenge Flex.'

A 1988 WindRider Magazine review stated, '... the harder he pushed it, the better it turned ... the most interesting aspect for us, was that the board could be adapted to each sailor's style and weight, making it ideal for sharing as well as variable conditions. This board is fun for nearly any sized person.' While the idea was sound, cost and some issues with springs led to its demise. Regardless, the idea was firmly embraced.

A more recent adaptation, has been that of Cut-Outs, the primary purpose being to improve longitudinal pitch stability fore and aft, using wide tails, promoting early planing, at which point the hull progresses to a narrower planing surface - the thinner the 'cut' the truer this is, leading to potentially high speeds due to reduced drag. However, the system is still essentially fixed and offers only marginal levels of adjustment and still fails to address a host of issues, related to board trim, ride comfort and more.

Other shapers have made various attempts in different variations of the concept over the years, but they all disappeared on account of certain impracticalities. As recent as 2010, a flexible morphing tail was created by Bouke Becker, but this too, like other concepts, has never gained traction.

Nevertheless, the idea remains sound, only limited by technical difficulties of construction and a user-friendly solution in respect of ease of use which would elevate the concept from impractical, to a genuine seminal moment in the sports evolution. It should also look good and above all, avoid being overly complex.

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Thirty years on, Mistral is once again revisiting the concept, with the firm belief, the barriers to use have finally now been broken, by the use of advanced materials and simplicity of design which permits genuine adjustment options.

### **Optimum Angle of Attack**

‘The angle of the dangle’, as they say, is the difference between pain or gain. In the world of windsurfing, keeping the hull parallel to the water over the angle of travel, ensures a foot to the floor, pedal to the metal, flat-out angle of attack, ensuring an optimum planing angle. As the nose lifts under power and the forces on the sail act to work against the angle of travel of the board and the tail lifts, it inevitably leads to a loss of control and even potential stern-suction in angling downward, causing excessive drag.

The relative angle of the board, is determined by a multitude of factors, not least of which is rider body-mass and while wider tails offer more or even less stability under certain conditions, narrower tails offer less lift resulting in a never ending revolving door of compromises.

Cutouts offer what amounts to trickery in the transition between non-planing to planing phases, by building-in both wide and narrow steps, thereby attempting to offer the best of both wide and narrow attributes. Ultimately it seems to have manifested into something of a dark-art, remaining a clumsy solution which still results in an inanimate object.

### **Variable Rocker Trim System VRTS - Pat. Pend (protected)**

Designer and creator, Neil Scheltema of South African blood, now a converted Aussie living in Western Australia, has been in the windsurfing industry for a lifetime, the sum of which would add up, to two average lifetimes of casual interest. A maverick thinker and perfectionist, he is your quintessential designer who revels in problems for the sake of a solution, who has worked with the best of them in the industry.

‘Like art, the idea filtered through until it became what it is. All the explanations in trying to explain how it functions, detract somewhat from the countless creative collections of micro-

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evolutionary steps to get there. As for for my motivations, cut-out boards with flat rocker-lines were for me a possible over-simplification of a complex problem and from this it seemed to me, from an evolutionary perspective, windsurfing hull design was in fact not advancing in any real meaningful, practical way.'

Historically, the industry has encouraged ownership of one or two boards and a quiver of sails. Nothing wrong with this you say, save for the fact it misses the point and is fundamentally flawed on about as many levels as you care to look at it.



Differing body masses, differing wind strengths, differing sea surface states, differing sailing styles, all create limitations and optimums, so as the board performs for the most part, well below the designers intention. Much of this is due to the simple reality, a board is an inanimate object, incapable of morphing into anything more or less than it is.

But what if you could bring some degree of animation to an otherwise un-alterable shape, so as not only to create morphing in relation to conforming to the fluidity of water, but so as the rider could in addition, make micro-adjustments to alter performance in relation to body

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mass, wind strength, sea state and a number of other idiosyncratic riding characteristics, in order to have some control over external factors.

If it were possible, if were effective, if it were a reality, if it were here now, you would have to consider it a game-changer if it gave you control over your ride, your ground speed, your turning speeds, comfort and more besides.

‘Having created the system and through repeated testing, by myself and many other top level sailors here in Western Australia, the system absolutely works and from it other benefits have emerged. <https://mistral.box.com/s/s56839gelycgqjsmdr4464d6ybihpvt8>

## Introducing Mistral’s FreeSpeed VRTS Boards - Pat. Pend (protected)

It’s appropriate to stress our intended nomenclature and philosophical appraisal of where our FreeSpeed VRTS boards fit into the grand scheme of the world of windsurfing and why we have named them so.



**FreeRace boards** are loosely described as cross-over boards, falling between that of the FreeRide spectrum and that of the full-throttle world of the **Slalom** board. They are in short, de-tuned versions of

manufacturer’s dedicated Slalom sticks, where added user-friendliness and comfort, open up a wider market and appeal to the weekend warrior, so as GPS competition and even a chance to race are always on the cards. **FreeRide** boards on the other hand, offer Cadillac-comfort for the straight line, recreational sailor in flat to moderate waters, where hard turns at speed are neither the end goal or even radically achievable.



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Mistral's FreeSpeed VRTS boards, can be considered as an extrapolation of all idiosyncratic traits inherent in many Slalom, FreeRace and FreeRide boards. In short, they could be considered the Chameleon of the windsurfing world, where morphing from one expected level of performance to another, is now entirely at the hands of the end-user. The ramifications challenge the idea of the need for ownership of a FreeRace or FreeRide board, where one board can do it all and indeed go on to challenge the Slalom board head on, all in the one package.

The rocker line of the boards we have used, in combination with the adjustable plate, promotes early planing and have been considered holistically, so as board and plate co-exist in harmony. We've been able to maintain a reasonably wider tail for added control, stability and improved light wind performance aided by the rocker-line of the board and the extended planing area. <https://mistral.box.com/s/8cus71jeuyaj3uo90cfbsdbqq62lm4o2>



Four differing FreeSpeed VRTS boards will be initially offered (Vol based on blank weights / density calculations) 58 x 240 x 95lt, 64 x 243 x 105lt, 70 x 246 x 115lt, 76 x 249 x 125lt and you can expect x 3 differing size of FreeWave VRTS boards, currently in the pipeline.

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By comparison, Cut-Outs may reduce planing-areas, but make for flighty boards. Here we have a vastly improved and more user-friendly system. Our boards have continuous rocker, which promotes a much improved angle of attack, conforming better to the water surface, while the flex-tail takes care of the rest. Flatter-rocker lines with narrower tails, are slow comparatively to plane and ultimately have a severe angle of attack and Rooster-Tails are a sure sign of inefficiencies.'

## **Upwind Benefits**

Our Variable Rocker Trim System, acronymed VRTS, improves upwind performance on account of the tail flexing both torsionally and vertically in the troughs, making it easy to trim the board over each wave, so as you skim over the peaks rather than smacking into them. The end result, is a smoother ride for both board and body.

## **Extended Planing Time, Improved Ride and Smoothness**

Under full-power, tail-walking is all but eliminated. The trim-plate flexes (tensions) and releases (relaxes) pressure build up, encouraging extended planing time due to improved consistency of the laminar flow of water. Gybing smoothness and therefore speed, is greatly improved. Over choppy waters, it comes into its own, making for a much smoother cushioned ride, improving control, flat-line speed and of course, rider enjoyment.

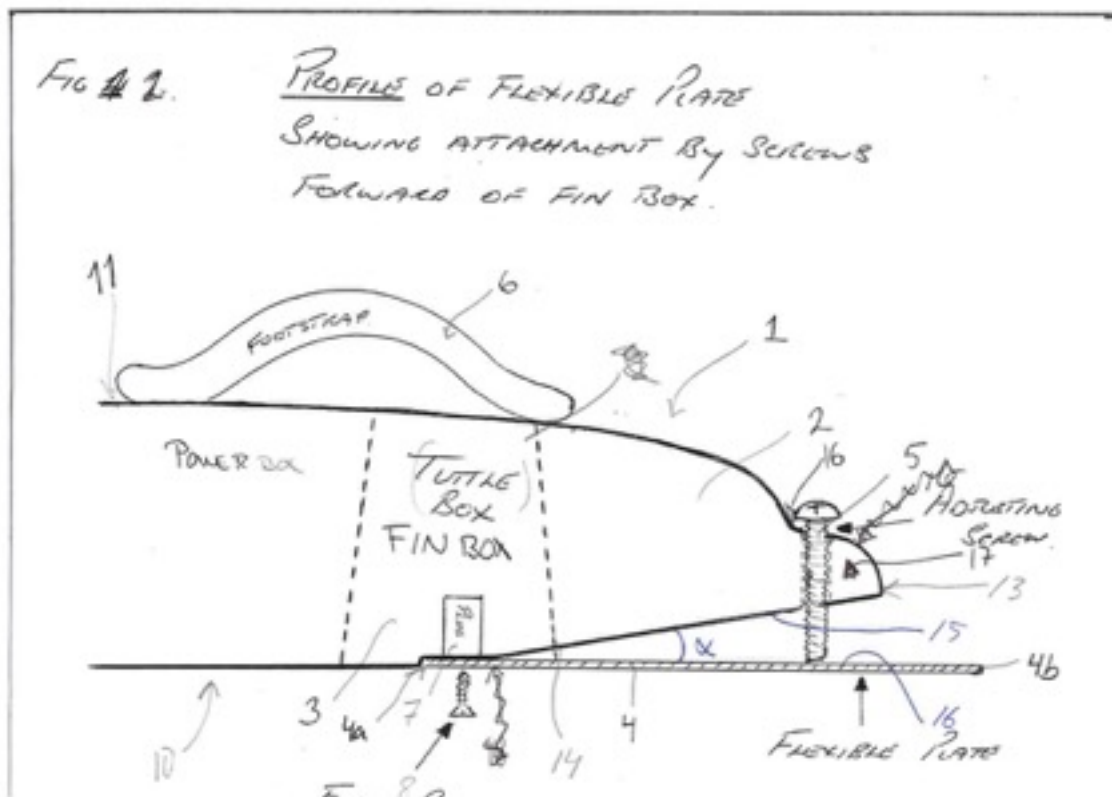
## **Reduced Cavitation Issues**

Ventilation is lessened and therefore cavitation, being as the flex-plate extends beyond the fin-box, inhibiting air suction downward from the surface.

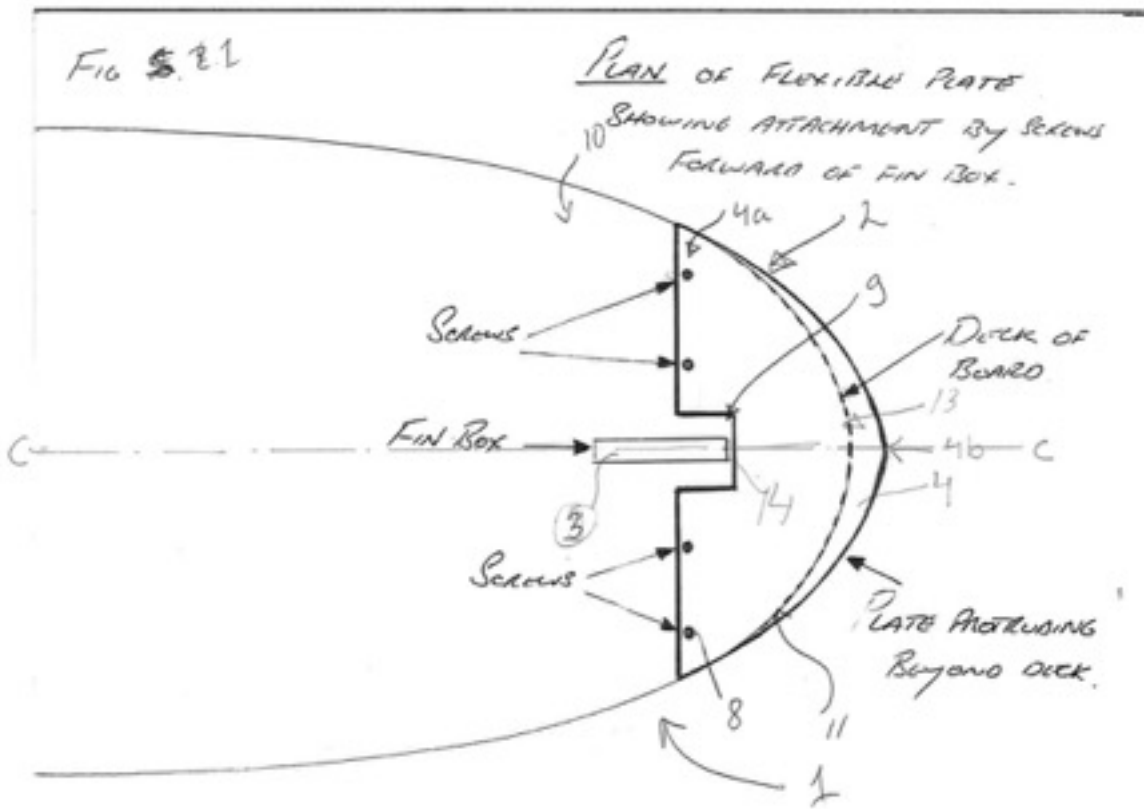
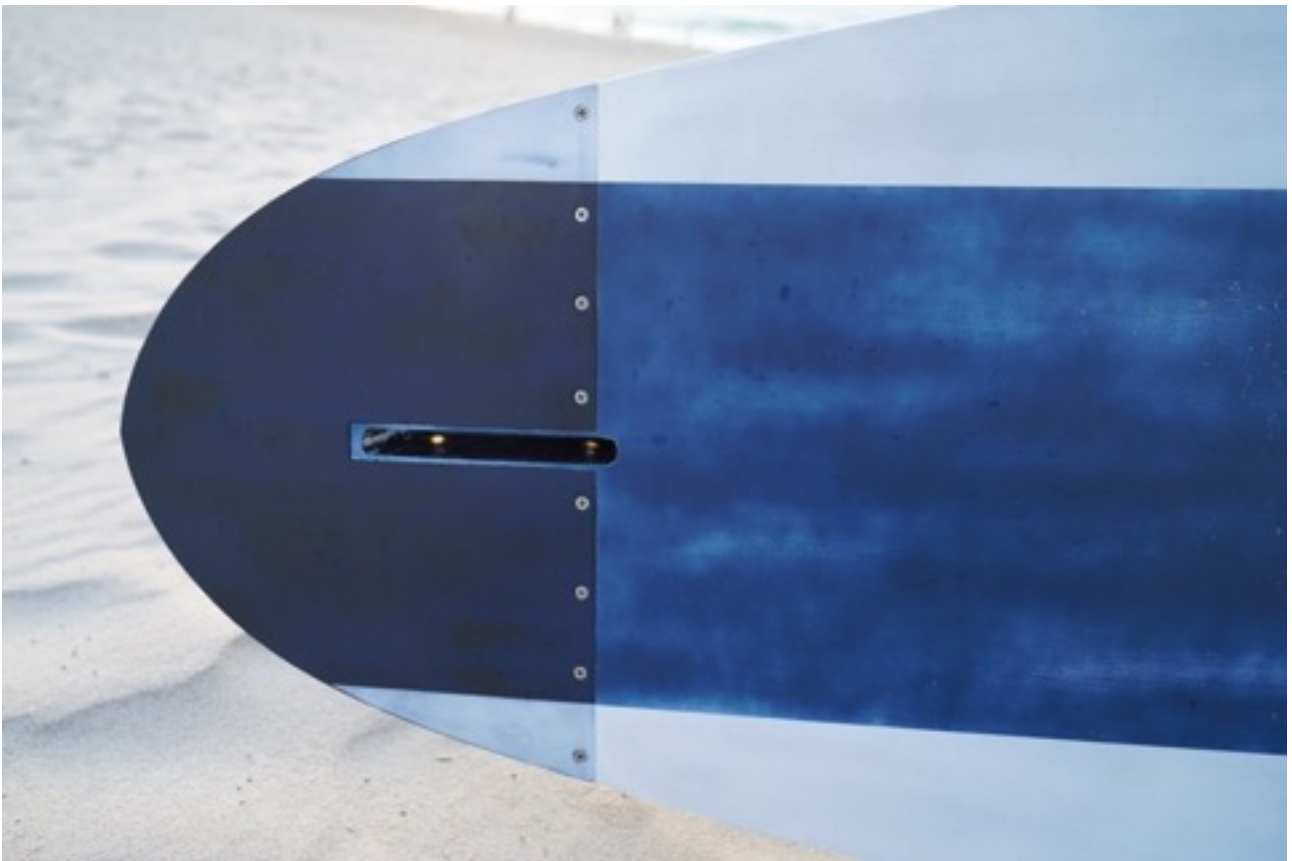
## **Tensioning and Winding Off the Tensioning Screw**

Winding off the screw in lighter winds, will permit the flex-tail to compress and spring back to shape over a great range of travel, acting as a shock-absorber, while also reducing the wetted-surface area, without fear of loss of control.





As wind strengths increase, tensioning of the screw downward, to either be in contact or just off from the plate, helps negate increased pitch (angle) of the hull as the board rolls-



back onto the tail as the nose rises with increasing speeds, increased foot-pressure and lift generated through force acting on the sail. As the plate flexes, it will meet the screw and its

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travel will be stopped. Tensioning the screw therefore, lessens the rocker line almost to neutral if you wish, encouraging early planing times and reduces incidents of stalling, so as the angle of attack remains optimum.

Conversely, should you feel you're being over-powered by too large a fin, you can wind-off the adjuster, so that it effectively de-powers or de-tunes the tail, so as to increase the boards angle of attack, soften the ride, increase control and give you the sensation, you are travelling using a smaller fin. You could perhaps think of it as Sports-Mode in a car or perhaps as Traction Control - where you have the ability by increments, to switch it on or off, resulting in varying degrees of looseness or stiffness, all with the turn of a screw.

The more flex you permit (angle of travel) of the flex-plate, the looser the board will become and vice-versa. It will also act to cushion the board over choppy waters.

Central to this, the critical element relates to the trim of the board and how the differing degrees of tensioning affects this - experimentation is the key.

For more images <https://mistral.box.com/s/8oopvbk04360qcj6ddzjbxjzrjtsf174>