

# TANSW - Jib Sheeting Trial - First report.

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## Summary.

The proposed system of the new Ronstan Series 19 track, fairlead, ratchet block (cheek block) and cleat have been attached to the port side of the club Tasar of Balmoral Sailing Club (BSC) and will be subjected to comparative testing over the next few weeks following which the proposed system will also be attached to the starboard side (with a different ratchet block) for further testing.

The intention is that following this testing at BSC, this boat will be made available to those attending the NSW State Championships at Easter to trial before and after racing.

**Trial methodology** on page 3 details the approach being taken and reports on progress of these various points. **Rationale for the Proposed System** on page 5 is included as a reference.

I would like to formally note the support of Alistair Murray with this project, thank Derek Johns (Product Development Manager at Ronstan International) who responded very quickly to technical questions and Ronstan International generally for supplying parts gratis for the trial.

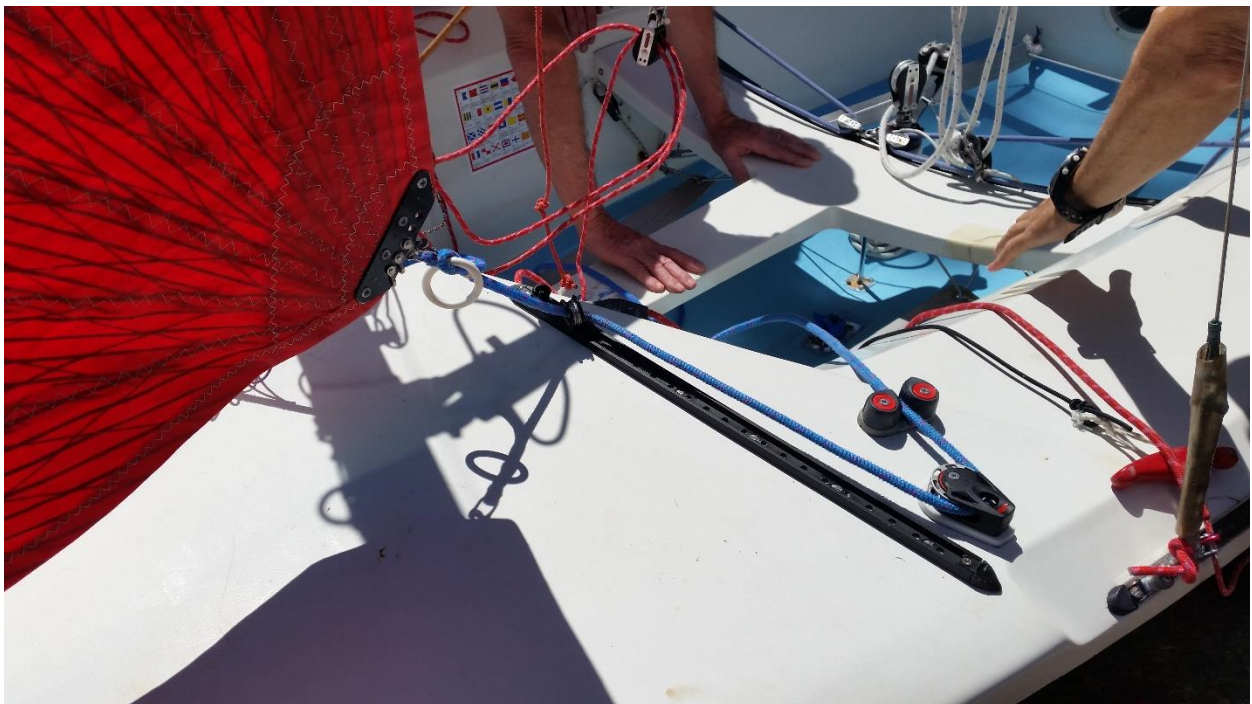
A practical point to report on is that as with attaching the current jib track system it is a long reach to the outer fastenings but fitting the ratchet block and cleat was achievable without inverting the boat.

Brad Stephens

20<sup>th</sup> February 2019



**Club Tasar at BSC with proposed system installed on the port side.**



**Jib hoisted, sheet through the system for the first time. Because the fairlead is moved outboard to set the whisker pole there may be no need for longer jib sheets.**

## Trial methodology.

The following represents the trial methodology as initially created and reports on activity for each point.

1. Measure the holding power of the ratchet block in the proposed system. (> 135 degree wrap on block for upwind sailing.) *//The model presented during the National Championship at Largs Bay was used as a test harness (see image on following page) to measure the holding power of the ratchet block in the proposed system. With a 6kg load on the sheeting side (not cleated) the block held at 31.5 kg on the clew side and slipped at 39kg. This represents a holding power greater than 5.25:1 but less than 6.5:1. The 39kg on the clew side is equivalent to a fully sheeted sail in a true wind speed of 20 knots.*
2. As a comparison only, measure the holding power of the ratchet block if it was placed at the current fairlead position. (Approximately 90 degree wrap on block.) *//With the fairlead car positioned to reflect installing a ratchet block on the current jib cleat plate and again with a 6kg load on the sheet side the sheet held at 7.3kg on the clew side but slipped with 14.8kg on the clew side. This reduced performance with less wrap on the ratchet block would be obvious to most, but it is good to put a number on it to substantiate the approach being taken.*
3. Validate the new Ronstan Series 19 system with respect to load when in use. (Appropriate Design Factor/Safety Factor to be applied.) *// Sheet loads were calculated from both standard empirical formula and Finite Element Analysis (FEA) via AzureProject, a sail design application. From these values the load on the fairlead car was calculated. This data, which was well below the MWL for the fairlead car, was provided to Derek Johns who responded that he was "...comfortable using this car on the Tasar.". He did have a concern regarding the S40 series block with the thought that a crew pushing out with their legs, on an already fully tensioned sheet may occasionally overload the block. This advice, together with the auto/manual functionality is a reason to test the S55 on the starboard side.*
4. Have Julian Bethwaite, as Designer, comment on the installation of a cheek block and cleat in the foredeck area aft of the jib track position. Are backing plates required or will the use of large washers be enough for what will be shear loads? Should the foam core be removed locally around the fastening hole and filled? *//This step has not been formally undertaken at this stage based on the advice of Chris Parkinson although he has indicated that Julian will be informed as and when the opportunity arises.*
5. The first on-water test would see the ratchet block and cleat mounted to the port side of a Tasar, use the existing fairlead on that side and compare in use to the standard system on the starboard side. It might be appropriate to use the club boat at Balmoral Sailing Club for this testing and the boat could be made available to sailors for trial sailing. *//I had thought initially to retain the current port side fairlead so as simply be a test of the ratchet block and cleat installation. As reported in the Summary the complete system has been installed on the port side to enable early examination of the fairlead and track in use.*
6. With what is hoped is a positive response from point 5 and assuming answers from points 1 ... 4 are positive move to a complete installation on the test boat. *//Next step following initial testing. On the port side, a Ronstan S40 auto-ratchet block has been installed. On the advice of Derek Johns, a Ronstan S55 series auto/manual ratchet block will be installed on the starboard side for comparison against the Series 40 block.*
7. Make the test boat available to sailors to trial and offer feedback. *//This will occur both at BSC and is intended to occur during the NSW State Championships at Easter.*



**The test harness for determining the holding power of the ratchet block.**

## Rationale for the proposed system.

If there was an off the shelf replacement part for the jib fairlead/cleat on the Tasar that offered the handling advantages of a ratchet block it would already have happened and Tasar crews would have benefited from the same improvements that have seen ratchet blocks replace the simple blocks for the mainsheet and traveler. That there is no off the shelf replacement part has always made improving the jib sheeting system on the Tasar problematic.

1. Adult female crews are generally strong enough to pull the jib sheet on as hard as necessary but controlled release in strong or gusty conditions can be problematic and active trimming (as helms do with ratchet blocks on travelers) represents some difficulty for the typical female crew of average to good strength.
2. Any modified sheeting system must protect the geometry of the existing fairlead with respect to sheeting angles (vertical and athwartship) although practically there was a minor change moving from the original Ronstan fairlead to the Holt-Allen, now Allen system.
3. A 2:1 purchase system can be (and has been) used from the standard fairlead position although it creates some handling issues with additional sheet length to take-up and keep clean (no tangles). A 2:1 adds mechanical advantage which fix's the issue in 1) with respect to controlled release of the sheet but adds complexity and is not a universal solution for all.
4. Adding a ratchet block at the fairlead position ( assuming current sheeting geometry is retained ) is unlikely to create enough wrap around the ratchet block to provide good holding power.
5. Boats that were similarly rigged to the Tasar in 1975 such as the NS14 have all moved to turning blocks (ratchet) and deck mounted cleats and other similar sized boats (470 & Fireball) have been able to introduce ratchet blocks into their jib sheeting systems.
6. Practically, the solution to an improved jib sheeting system for the Tasar, that is of universal benefit, is to mount a ratchet block (cheek block) and cleat on the side deck at the outboard end of the track and change the track/fairlead to a style that will protect the sheeting geometry. Note, a ratchet block allows for a controlled release and active trim through its holding power, but it does not provide mechanical advantage, which is considered unnecessary (see point 1.).