



Skiff Guide for Coaches

Rob Fox and Matthieu Debreucq, Summer 2011

Class-Specific Knowledge – Evaluation Criteria

Ability to communicate technical knowledge in at least one class (rigging, boathandling, boatspeed)

Ability to use basic sail theory and knowledge from one class, to learn other classes

Sources expert tactical/strategic input when the technical answers are not known.

This manual was written as a guide for Canadian club and provincial level coaches working with athletes in the Competition-Introduction and Competition-Development streams (usually 13-18 year old sailors from beginner to pre-national team level training and competing in the 29er, with application relevant to similarly rigged skiff-type asymmetrical spinnaker boats like the 49er, RS Feva, Vector, etc. While most of the instructions below apply to all skiff-type boats, they are based on the 29er, and may require slight adaptations for other types.

The manual is organized into sections as follows:

Rigging Guide

Communication and Roles in the Boat

Body Position and Trapezing

Boatspeed: Technique and Settings – Light, Medium & Heavy Wind

Boathandling – Tacking & Gybing

Other Boathandling skills – Bearing off, Heading up, Capsize Recovery

Start Line Acceleration

The manual is designed to help coaches give skiff-type athletes a strong base set of skills that they can then expand on with regional center and national team training groups.

It should be noted that styles and techniques sometimes change gradually over time, with equipment changes, and most significantly with changing body size/shape of sailors in this age range. It should also be noted that there are various styles and techniques that work for different people – the styles and techniques presented in this manual are simply one good proven version for beginner and intermediate sailors to build a base off. Any additions or changes to this manual are welcomed and may be included in regular updates of this manual.

Introduction to Skiffs

Introduced in the late 1990's, the 29er is one of the best platforms to learn the boat handling and agility that is required to sail the new generation of high performance boats like the 49er and the upcoming ISAF women's skiff class, and even RSX, foiling Moth and catamaran classes. The boat should be sailed with a combined weight of 280lb for optimum performance BUT can be sailed competitively in a range of 240lb combined and up to 320lb combined. Any combination of sizes that achieve this weight can be used, however if there is a big discrepancy between team member sizes, the taller of the two crewmembers should act as the crew with the other acting as helm.

Rigging

While sailing, skiffs are subject to high speeds and high stress loads. While the 29er is an incredibly durable boat, sailors must take care to regularly inspect their equipment to make sure it is rigged properly and in good condition.

Proper rigging and care is the basis of all boat handling and boatspeed, so as a coach take time to teach your students correctly the first time and get them into the habit of checking their equipment for problems regularly (at least once a week, if not after every day of sailing), and replace damaged equipment or fraying lines before they break completely. The spinnaker system in particular needs a lot of attention to make sure it is rigged properly and kept in good shape - if possible a test hoist on shore is usually a good idea before you go sailing.

In general, the factory rigging tuning guide is a good guide to follow and can be found at http://bethwaite.com/pdf/29er%20rigging_manual.pdf . Below are some additional modifications you will need to make for a race-ready 29er.

i. Taping up the bow eye, outhaul, and control hooks

It is very important to tape your split rings at the front of the boat. If you don't, there's a good chance that: a) the split rings will snag your spinnaker in a gybe and rip it; b) the bent split ring will fall out of the clevis pin, the clevis pin falls out of the bow eye hole, and your rig comes down (We HAVE seen this happen!). Taping the split rings before launching will save your spinnaker, your split rings, and your sanity.



We also recommend that you tape your control hooks. In the picture we see the out haul taped. You should also tape the cunningham and boom vang hooks. This way you are sure that you will always be able to adjust your controls without the hooks slipping out.



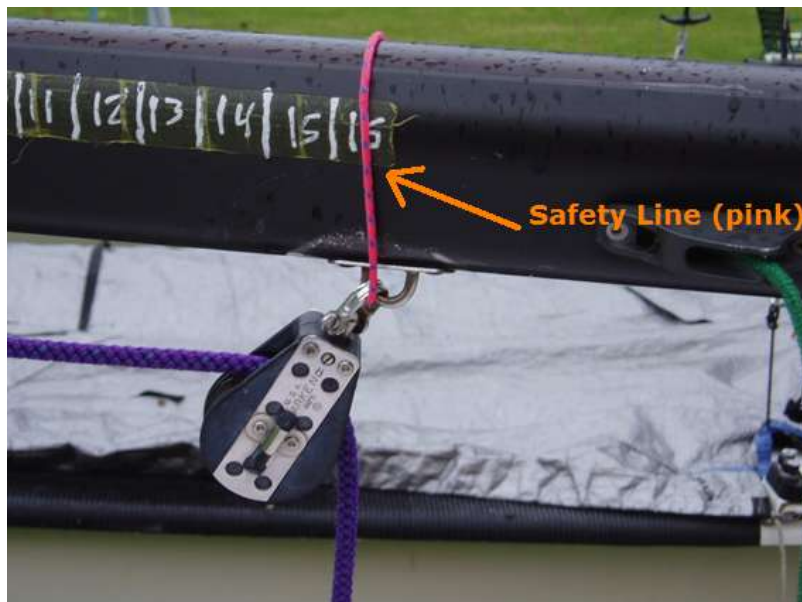
ii. Cover up or tape your shroud chainplates

Another good thing to do is to cover up your shroud chainplates. Some people like to use tape for that but you end up using a full roll every week. I recommend you use a bike tire inner tube and slip it over the plate. This will make the cockpit cleaner and avoids the spin sheets catching on the split rings.



iii. Safety lines on your mainsheet block and top mast spinnaker halyard block

Your boom blocks and spinnaker blocks need a safety line. This way you won't lose them if a rivet pops out and the fairlead breaks. The most important one is on the spinnaker block at the top of your mast. If the spin halyard block fitting comes off up there when your spinnaker is up, the spinnaker halyard (under pressure when hoisted) will tear a hole down the front of the mast....a safety line up there will prevent this. In the picture below the pink safety line is tied around the boom and through the mainsheet shackle, then tied off with a reef knot and taped. The spin halyard block at the top of the mast is more difficult as you cannot tie around the mast without getting in the way of the mainsail track.



iv. Spare tiller

Whether you use double tillers or a single tiller, its a good idea to have an extra one in your boom in case anything happens. You can see in the picture how to secure it. As a coach, you should get your athletes to practice switching it out on windy days.



v. Double tiller bungee

If you sail with double tillers you should have a bungee running at the back of your boat to make sure that your tillers stay close to you when you tack or gybe.



vi. Hiking straps

It's a lot easier for the skipper to find the hiking straps if you have the same set up as in the picture. The bungee will pull the straps tight and raise them off the cockpit floor.



vii. Help your spinnaker blocks stand up

To help your gybes you should have a tennis ball (or spring, or wrap them with bungee then tape) to hold your spin blocks upright in place. It makes it a lot easier for the crew to grab the spinnaker sheet in gybes and hoists since he/she can expect the block to always be standing the same way.



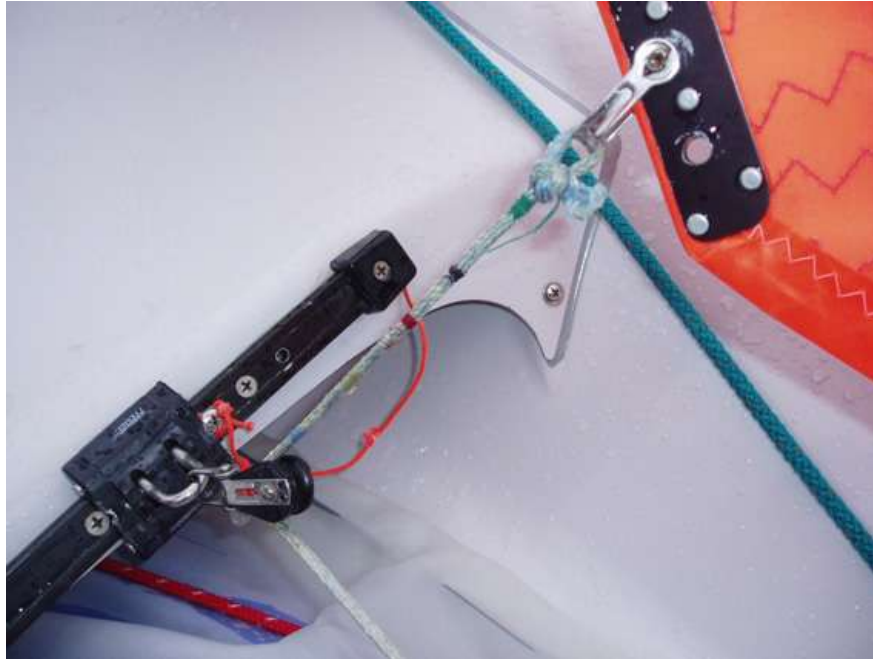
viii. Taping certain types of trapeze hooks

If trapeze hooks look like the ones below, it's a good idea to tape them to make sure that the crew hooks in on the correct spot.



ix. Jib Sheet

It is good to have a mark on the jib sheet to indicate how much jib sheet you have on. In the picture you can see a color code that your team can have. It makes it easier to talk about how much jib you put on with your tuning. You can also put these marks on the jib sheet where they come through the jibsheet cleat if marks are easier to see there.



x. Adjustable Race Bridle

The factory bridle that gets delivered with your boat is in all likelihood non-adjustable. As we will see later, it will be important to be able to adjust the height of your bridle depending on conditions. Remove the existing system and replace with an adjustable bridle.

xi. Spinnaker System

As mentioned earlier, the spinnaker system is one of the most important parts to get right during rigging as it is very difficult to fix on the water. We strongly suggest tuning the system on a light air day, and checking to see if the spinnaker system is rigged correctly and running smoothly by doing a 'practice hoist/practice gybe' before launching every day (as long as the wind is not too heavy on shore).

i. In tuning the pole, it's important to remember that:

-The tack line (one coming through the pole) will dictate how far the pole can go out and how close the spinnaker tack gets to the pole - it should be tight to the pole after hoists.

-The stopper ball on the tack line inside the pole will dictate how far back you can get the spinnaker into the spinnaker sock after a douse - if it's too short the spinnaker will be hanging out of the sock. The stopper ball also dictates when the spinnaker starts to leave the bag during the hoist (should be nearer the beginning) and when the pole comes in the douse (should be near the end). A good rule is if the white tip of the pole (the forward 10-20cm) is just outside the bow, and the

spinnaker head is just safely inside the sock, the stopper ball should be jammed up on the underside of the block on the front end of the pole.

-The line from the back of the pole, through the floating blocks and to the starboard gunwhale dictates how far back the pole can go after dousing. Again, only the front 10-20cm of white on the tip of the pole should be past the bow.

ii. Spinnaker retrieval system

As the spinnaker halyard is a continuous system, it is important to have a take-up system to remove slack during hoists and douses, otherwise the halyard gets kinked, twisted and knotted and the spinnaker will not hoist or douse. Below is the simplest system, rigged up with a piece of bungee and a c-clip that can be removed in very light air to get better sail shape.



iii. Douse preventer system

Finally, when you are dousing, you don't want the spinnaker halyard to re-cleat itself when you get going. The white and black bungee shown below tied between the starboard and center grab rails at the spin halyard cleat is a must to prevent this from happening.



Communication and Roles in the Boat (adapted from the DH guide)

Teamwork and communication are key themes in double handed sailing. Team members must understand their individual roles within the boat, and ensure communication between each other is positive and clear.

Roles in the skiff

Teams develop their unique role variations over time. However, with new athletes coaches should follow these general guidelines to help teams get off to a smooth start.

	Crew	Helm
Upwind	Mainsheet Vang and Cunningham Boat trim (fore/aft and heel angle) Overall racecourse management	Steering Jibsheet Limited / coarse adjust boat trim Close quarters tactical situations
Downwind	Spinnaker Sheet Communicating power in kite Boat trim (fore/aft, and heel angle)	Mainsheet & Steering Communicating sailing mode/angle Boat trim (fine tune for steering) Racecourse Management & close quarters tactics Providing a stable platform in manoevers

It should be noted that in light winds some of these roles may change.

Communication

How do teams communicate effectively? Each team must develop its own style of communication, because each team's personality differs. As a general rule however, communication should be factual, concise, and impersonal...in addition to being generally positive in nature.

Factual: Communication based on facts means that the team can focus on what is actually happening, such as "we're in a lull, the boat feels stalled" or "puff in 3 seconds, it should be a lift", rather than perceived themes such as "we feel slow."

Concise: This one is a given, especially if you've ever tried to communicate to your helm in 25 knots! Keep sentences short and consistent so that they are easy to understand. Short statements mean that the other person will need to spend less time deciphering the message. Consistent statements mean that the other person will always know what is being said. For example, if one crew consistently communicates gusts to her helm by saying "puff in five" and then one day says "pressure coming," the helm could easily be confused by this different message.

Impersonal: Communication between partners should be impersonal. This is difficult, especially during the heat of the moment. However, teams should constantly strive to communicate to each other in a professional and respectful manner, and this means avoiding criticism, blame, or other personal remarks. When training, remarks should be directed at performance, rather than at the individual. When racing, this becomes increasingly important, as emotions can run high and athletes can begin to blame each other for mistakes.

Body Positioning

Body and weight positioning in a skiff is the **key skill** for speed and control. Skiffs' design for speed – and their built in instability that results – requires sailors to have a keen sense of balance and agility with a strong foundation in body positioning. This section addresses correct body positioning for the 29er skiff.

Body Positioning Rule #1: Shoulders outside hips

The cardinal rule of any athlete sailor really is “shoulders outside hips”. This means that whatever weather condition you are sailing in, your shoulders must always be positioned above or outboard of your hips, and applies for both helm and crew.

There are several reasons why “shoulders outside hips” is always a good idea:

- 1) You are more stable, have a greater range of motion, and are ready to move.
- 2) Your head is higher up/more outboard and you are able to see more.
- 3) You are more comfortable and therefore able to concentrate better.

Body Positioning Rule #2: One person stable, one person mobile

While more experienced helms and crews will be making subtle body adjustments together, beginner teams should concentrate on having one crew member (usually the helm) stay fairly stable, while the other (usually the crew) take the primary responsibility for side to side boat balance. The reason for this is twofold: 1) beginner crews and helms tend to over-do body weight adjustments and when both team members over-trim their weight, the 29er becomes very unstable; 2) it is difficult for the crew to learn how to trim the mainsail with the helm moving around...the crew learns the “feel” of the mainsheet quicker if the helm maintains a consistent body position.

Note: In light conditions the roles will most likely change

Body Positioning Rule #3: Light air forward, Heavy air back

As breeze builds from medium to heavy wind, both crew and helm need to move back in the boat so that: a) the bow doesn't dig into the water, swamping the boat, and; b) to get the combined crew weight balanced over the flatter aft section of the boat, allowing it to plane.

As the breeze lightens up, it is important for the crew and helm to move forward in the boat so that: a) you can dig the sharper bow into the water a bit, using it as ‘second centerboard’ to maximize pointing upwind, and; b) to get the flatter, wider aft section of the boat out of the water so that it doesn't provide as much drag now that the boat is not planing.

One caution on this rule is that if you move too far back in heavy air you begin to lose the righting moment of the crew on the wire. This is because as the crew moves back, they get further away from the widest point of the boat (the shrouds), and will have to stand on a narrower section of the aft hull, essentially becoming ‘shorter’. In addition, moving too far back in heavy air causes the bow to pop up...while this is a good thing downwind to prevent pitch-poling, this is slow upwind if the bow pops up too much and the heavy wind begins to blow the bow off to leeward, which causes pointing and heeling problems.

Generally, crew and helm weight should be grouped together in the boat.

Body Positioning Rule #4: Flat is fast

Many types of boats like to be sailed flat, with no heel angle to windward or leeward. This is because when a boat is sailed flat, the Center of Effort (on the sails) and Center of Lateral Resistance (on the hull and foils) are balanced...providing maximum propulsion forwards and least drag backwards. A flat boat will also have the maximum sail area presented to the wind and maximum daggerboard/rudder area presented to the water, maximizing their efficiency.

Compared to traditional monohulls, skiffs like the 29er have flatter undersides, small daggerboards/rudders, relatively larger sail areas, and travel at higher speeds. As a result, even small deviations in heel from "Flat" tend to have bigger than normal consequences:

- the big sail area overpowers the small foils quickly (frequent with leeward heel)
- the high speed and chines can 'carve' the boat off quickly (frequent with windward heel)
- the flat bottom and small foils provide less resistance to sideways rolling, so when the boat does begin to heel, it continues to heel rapidly (frequent in light wind)

Skiff sailors will find that the key to fast ride is a "Flat" heel angle (deck parallel with the water). They will also find in turn, that the speed they generate with a "Flat" heel angle frequently makes the boat more stable as well.

An exception to this rule is in wavy/choppy conditions, where a little bit of leeward heel (no more than 5 degrees) keeps the bow out of the waves and allows the helm to steer through the waves with control.

Body Positioning – Trapeze (adapted from DH Manual)

Trapezing is one of the things that makes double handed sailing so exciting; it requires a fast and powerful boat and windy enough conditions to power up the rig. Trapezing is very simple: clip on and get your shoulders back. Trapezing well, on the other hand, is an art form. In order to trapeze effectively, the crew must be well balanced, agile, and able to balance his or her movements with those of the helm. The crew and helm must work together to keep the boat as balanced as possible and they must strive to move as smoothly as possible together.

Skill Breakdown: Clipping In and Getting out on the Wire (Skiff/29er)

- 1) Crew grabs wire above trapeze puck with front hand
- 2) Crew puts front foot up onto edge of windward gunwhale
- 3) Crew pushes body out with front foot – in a leg press motion – while hanging straight arm from front hand (if holding mainsheet crew will drag their aft hand along main sheet to keep hold of it so the main is not oversheeted as the crew moves out)
- 4) Crew brings aft foot out to windward gunwhale as front leg reaches full extension
- 5) Using aft hand (still holding mainsheet), crew clips trapeze hook into harness
- 6) Crew lets go of trapeze system and picks up mainsheet from helm (if they didn't go out with it)
- 7) Crew settles into proper trapeze form, trimming mainsheet for correct heel angle

It should be noted that first time and smaller crews will have difficulty holding the mainsheet while getting on the wire. It is common and acceptable for the crew to pass the mainsheet off to the helm while getting on the wire, then retrieving the mainsheet from the helm once they are settled in. This is especially so for 29er tacks, where the lack of space in the 29er cockpit make it difficult for the crew to carry the main through the tack without getting tangled.

The key with clipping in on the wire is to get out as quickly as possible. This is why it's important to teach athletes to clip in after they have pushed themselves out on to the wire. Clipping in from the gunwhale can be less smooth and may disturb flow over the sail and the foils. The smoother the crew becomes when pushing out and clipping in, the less he or she will affect flow over the foils and sails, and therefore speed.

Trapeze Form and Weight Placement

The whole concept of trapezing is that of using a lever to keep your boat flat. Proper form is all about the crew becoming the most effective lever possible while maintaining balance. A balanced crew will be able to move effectively on the trapeze so that he or she can maintain the overall balance of the boat.

Upwind: Generally, skiff crews on trapeze should be straight (as a coach you should be able to draw roughly a straight line from a crew's ankles to their knees, hips, and finally shoulders), with the head active looking upwind for puffs, other boats, etc.

Downwind: Many of the same rules apply to trapezing downwind, except crews should acknowledge they need to "ball down" on their trapeze system to lengthen their trapeze wires as they move to the back windward corner of the boat. Crews that do not "ball down" when moving back can expect to have their center of mass too high and they will feel unstable...the helm will also not have as much righting moment and will not be able to drive up high enough to generate power downwind off the asymmetrical kite. It is common for crews trapezing at the back of a skiff downwind to feel like they are being pulled forward, as their trapeze wire gets further away from the mast, and so need strong leg and core muscles to brace for this pull. Some 29er have footstraps, which help the crew brace against this pull. If their 29er does not have a footstrap, crews can place their aft foot under their helm's aft buttock.

Below are some guidelines to further help your crews achieve effective trapezing postures:

Feet: Together with toes pointed and facing forward or together and pointed with front foot forward and aft foot straight

Legs: Straight but knees unlocked, aft knee can be slightly bent for balance. Legs should not be splayed far apart

Torso: Fully extended with little to no bend at the hips unless light wind and the crew is high wiring. Torso should be facing forward so that crew can look to weather

Arms: Holding jib sheet (420) or mainsheet (29er). Avoid holding the trapeze puck.

Head: Looking to weather

Overall : Straight line from ankles, to knees, to hips, to shoulders, with head looking around

Ball Up or Ball Down?

The crew plays a critical role in keeping the boat balanced and moving in trapezing conditions. He or she can raise or lower his or her height on the trapeze by using the tackle on the trapeze wire. This is called 'balling up or balling down.'

Ball up: The crew should ball up if knees are constantly bent and the crew's waist is constantly below his or her knees.

Ball down: The crew should ball down if he or she is fully extended and the helm is frequently easing the main.

It should be noted that a common mistake with new crews is to try to ball up and down for every puff and lull. Get your crews to pick one moderate setting (between highest and lowest) for the average condition, have them fine tune heel angle with mainsheet and slight knee bends (keeping the upper body straight), and have them ball up or down only for significant changes in breeze strength.

Unclipping from the Wire

Again, it's important to emphasize that the crew must be smooth and light footed when unclipping from the wire and coming in. This is why it's important to unclip from the trapeze while still out on the wire, and then to straight arm hang in order to keep weight on the wire while stepping into the boat. Keeping the weight off of the crew's feet will help to keep the manoeuvre smooth and minimize any disturbances of flow to the sails and foils.

Skill Breakdown for Unclipping

- 1) Crew holds mainsheet tight with aft hand (or passes mainsheet to helm in a 29er)
- 2) Crew grab wire above trapeze puck with front hand
- 3) Crew lift hips to release trapeze hook from trapeze bale (crew is now hanging straight armed from puck)
- 4) Crew bends knees and steps into cockpit with aft foot first
- 5) Crew releases trapeze system and sits or stands on windward side (depending on breeze)

Tips for Teaching Trapeze

On land with wire system clipped to wall, have athlete clip in using straight arm technique. This way he or she will build muscle memory in a safe environment.

On water, pair athlete with an experienced helm and again practice clipping in using straight arm. An experienced helm will provide a smoother platform for the athlete learning to trapeze. If upper body strength is an issue, ensure that the front arm is kept straight as if in a dead hang

Trapezing video can be found at:

<http://www.youtube.com/watch?v=h2xgBKxxpa8&feature=related>

Related information for boat balance, Centre of Effort, and Centre of Lateral Resistance can be found in the Sail Theory module.

29er Boatspeed: Tuning and Technique

Below are control line settings, body position, sheet tension and techniques used to maximize upwind and downwind boatspeed in the 29er, as developed by Rob Fox and Matt Debreuccq in coaching the class in North America and Europe over several years. It should be noted that different crew sizes will need to adapt these settings.

Condition (Wind)	Light (0-5kts)	Light-Medium (5-9kts)	Moderate (9-13kts)	Full Trapeze (14-20kts)	Heavy (20+kts)
Key points/Focus Areas:	*Keeping leech and slot open *Keeping weight forward	*Playing 2" of mainsheet *Deep, hooked sails, little vang *Crew adjusting weight smoothly	*Vang/outhaul link is important *Drive jib and play main to keep boat flat	*Halyards hammered on *Keep speed up & boat unloaded (open leeches)	*Halyards hammered on *Keep speed up & boat unloaded (open leeches)
Upwind Technique					
Considerations: heel angle, body weight, main and jibsheet tension, vang-outhaul combo, waves/chop, cunningham, slot, leech return, sail depth	<ul style="list-style-type: none"> • slight leeward heel for max waterline and to keep boom to leeward • make sure vang is off • slot/leeches should be open (see leech ribbons) • crew body weight forward and together, sneak in sheets with pressure...but don't stall out! 	<ul style="list-style-type: none"> • slight leeward heel to track high • crew smoothly swinging in/out to keep heel angle, weight fwd (temporarily back with bad waves) • playing mainsheet from block-to-block to 2" off • vang and cunningham off/deep sails 	<ul style="list-style-type: none"> • crew trapping straight & toggling where appropriate • helm playing main to keep boat flat • vang on is very important to maintain sail shape with leech centreline, • drive to jib ticklers while keeping boat flat with main • boat flat to slight lee heel 	<ul style="list-style-type: none"> • crew trapping straight, may need to adjust toggle height up for waves, weight too far back allows bow to blow off • drive jib ticklers and play main to keep speed up and boat heel constant • important to keep slot open • Cunningham on to help keep boom centreline 	<ul style="list-style-type: none"> • crew trapping straight, may need to adjust toggle height up for waves, note: weight too far back allows bow to blow off • drive jib ticklers and play main to keep speed up and boat heel constant • important to keep slot open • raise bridle & ease vang
Downwind Technique					
Considerations: heel angle, body weight, wind angle, waves/chop, vang	<ul style="list-style-type: none"> • slight leeward heel for max waterline and to keep boom to leeward • vang and cunno off • don't drive the boat too low, err on higher angle in chop 	<ul style="list-style-type: none"> • slight leeward heel to flat (depends on sea state), • soak low in puffs • make sure vang is loose, but on, and cunno is off • trapezing mid-boat may be fast 	<ul style="list-style-type: none"> • flat boat • crew on wire (add slight leeward heel if choppy) • helm on rail and playing main to keep boat steady • steer around big waves 	<ul style="list-style-type: none"> • crew weight down, back and hiking hard • may need to choke/flog kite to slow down for bigger waves and avoid pitchpoles • mainsail control important 	<ul style="list-style-type: none"> • crew weight down, back and hiking hard • will need to choke/flog kite to slow down for bigger waves • mainsail control important
Settings					
Outhaul	more on	more off	balance with vang	balance with vang	more on (wave -dependant)
Bridle	up	up	down	down	up
Jib Halyard	clean jib entry	scallops	clean jib entry + a bit more	hammered on	hammered on
Tension (Pins)	180-200 on forestay	180-200 on forestay	220-240 on forestay	280+ on forestay	300+ on forestay
Jib Clewboard (track)	Top (inboard hole)	Top (inboard-middle hole)	top-middle (middle hole)	middle-bottom (mid-outboard)	Bottom (outboard hole)

Additional Boatspeed Notes

Keep it simple! The 29er is a lot more about boat handling than rig tension. You should have 3 settings : light, medium and heavy – 180, 240, and 300lbs on forestay tension. Finding these tensions will be different for every boat since the chain plate is really big and each boat is slightly different. Try to get as close as you can to them.

Light Wind

- Outhaul : one 'fist' from the middle of the boom to the sail.
- Sail in displacement mode, flat like any other boat. Go for pointing upwind and for depth downwind when you have the pressure to do so. Body weight placement is crucial – maximise your water line with your weight forward.
- Downwind you have to go for pressure as it will sometimes double your speed.

Medium Wind

- Cunningham: Use it to depower the boat upwind when needed. The more cunningham you put on, the more you depower BUT you need to keep the draft of your sail forward, so if you vang a lot you will need to compensate with a little cunningham. Outhaul : Keep it off for as long as you can handle it. If you need to dump the main, pull some in.
- Sail in planing mode, using sail trim and crew body weight to maintain a flat boat. Very important is that you minimise your down speed time by bearing off, easing the sail, getting back on a plane and then heading up when you get up to speed again. Remember that height will come from speed (and the resulting lift off the foils), not by pushing on the tiller.
- Downwind you want to have some weight on the trapeze and plane, BUT remember you want to go downwind so recognise the lulls and get off the trapeze before the boat heels to windward or the helm has to head up too much to keep you on the wire.

Heavy Wind

- Vang: Start to ease it a little when you get over powered and you need to dump more than 2 feet of main sheet.
- Cunningham, jib halyard: Don't be afraid to pull them on hard. You'll be driving off the jib, so need to make sure it is set up correctly. Outhaul: All the way in
- Upwind, put the pedal to the metal! Trapeze and hike really hard, keep the boat super flat and moving fast through the waves.
- Downwind, depending on the sea state you may have to choke the spinnaker (oversheeting it), or curl the front 1/3 of the spinnaker luff to slow down and avoid pitchpoling into some of the bigger waves. Do it smart - safety first.

Skiff Boat Handling

It is common for Canadian club coaches to work extensively on the tacking, gybing, and other skills that make up boat handling. Remember though that most of the race is spent sailing in a straight line, and that good boat handling technique is not possible without first entering the boat handling manoeuvre with proper straight line technique. Naturally, the boat cannot be sailed without knowing how to tack, gybe, head up or bear off properly (capsize IS the slowest point of sail!), however this manual encourages coaches to spend more time on straight line technique than in the past, to maximize boat handling technique and overall athlete development. Remember “entry often equals exit” when talking about boat handling!

Below are basic skill breakdowns for tacking and gybing skiffs – particularly 29ers. We will start off with a standard medium air manoeuvre and follow with adaptations for different wind conditions.

29er Tacking

Two tacking versions are presented below. The first is the version teams will need to use when the crew is on trapeze. The second is the version teams will need to use when the crew is not on the wire.

Simplified Wire-to-Wire Tack

Helm	Crew
1) Prepare for tack – “ready to tack?”	1) Acknowledge – “ready”
2) Drop jibsheet & take mainsheet from crew	2) Pass mainsheet to helm, unclip trap hook and straight arm hang
3) Push tiller and sheet on main	3) Swing in as boat turns, aft foot first
4) Cross boat with light steps and looking forward, releasing some mainsheet	4) Cross boat with light steps and looking forward, grab new trap wire
5) Do tiller-mainsheet exchange	5) Swing out, forward foot first and straight arm, clipping in as boat comes flat
6) Pass mainsheet to crew, pick up jibsheet and settle in to new tack	6) Take mainsheet from helm and settle in to new tack

Expanded Wire-to-Wire Tack (Helm)

- 1) In preparation for the tack the helm needs to do a quick check to see if they are clear to tack, may need to crack off the jib an inch (especially in windier conditions), and needs to get their feet ready to move (in light air - getting the feet tucked up under body, when hiking – removing back foot from hiking strap. Obviously, the helm needs to communicate with the crew their intention to tack.
- 2) Helm drops jibsheet and takes mainsheet from crew (crew should not have to stretch back to hand mainsheet off).
- 3) As the helm pushes the tiller to initiate the turn, they need to make sure the sheet the main in all the way to help steer the bow through the wind (using the “big rudder”). If the helm lets out the mainsheet, the boat will heel to windward and not want to tack.
- 4) Looking forward, the helm crosses boat with light steps as follows: Aft foot out of strap, shifting weight off bum and onto feet as boat unloads; old aft foot crosses boat first, preferably to far side of centre bar; turn facing forward and bring old front foot to new aft position. As you do this final step the helm releases some mainsheet, partially to facilitate the exchange (in the next step), but more significantly to control the heel angle exiting the tack (too much mainsheet on exiting the tack will cause excessive heel, slow re-acceleration, and a possible capsize. The amount of mainsheet released is breeze dependant (more eased in heavier winds).

- 5) Exchange by bringing old forward hand (loosely holding the mainsheet) back to the tiller, grabbing both the tiller and mainsheet with this new aft hand, then letting go of the tiller with the old aft hand to grab the mainsheet. Sit down and get feet under hiking straps.
- 6) When the crew is clipped in, the helm puts the mainsheet in the crew's outstretched aft hand. The helm then picks up, and if necessary re-trims the jibsheet. Adjust body weight as needed and settle into the new tack.

Expanded Wire-to-Wire Tack (Crew)

- 1) Check to make sure mainsheet is clear and you are ready to move, then let the helm know you are ready.
- 2) Pass mainsheet to helm, grab trapeze wire above puck with front hand and trapeze bale with aft hand. Take weight on front arm, lift hips, and clear bale with aft hand. Hang outboard with straight arm (a bent arm will require more effort and crews will tire quicker).
- 3) As boat turns, crew swings in with aft foot to (or over) the center bar. Swing in must match the rate of turn – coming in too quick will cause the boat to heel excessively to leeward for a slow tack, coming in too slow will get the crew stuck swimming in the water on the new leeward side.
- 4) Cross boat by letting go of old trapeze wire, ducking under boom facing forward, then crossing old front foot over old back foot to new windward side. Grab new trapeze wire with old aft hand.
- 5) Push off old front foot, move old aft foot to rail, ease body weight onto new trapeze wire (moving to straight arm) and swing outboard by pushing out (leg-press style) with new front foot. Bring new aft foot to rail, grab bale with new aft hand, lift hips and clip in as the boat becomes flat.
- 6) Looking forward, hold your aft hand out for the helm to put the mainsheet into. Take the mainsheet and make necessary trap height, body position, and sheet adjustments to settle into the new tack.

Simplified Displacement (non-wire light air) Tack

Helm	Crew
1) Prepare for tack – “ready to tack?”	1) Acknowledge – “ready”
2) Drop jibsheet & take mainsheet from crew	2) Pass mainsheet to helm, stand up windward side near mast
3) Push tiller and sheet on main	3) As jib luffs, pump boat to windward using the mast
4) Cross boat with light steps and looking forward, releasing some mainsheet	4) Cross boat stepping lightly over the jib tack line, looking backward
5) Do tiller-mainsheet exchange	5) When sails set on new side, pump mast and shroud to windward, easing body weight back in as boat flattens
6) Pass mainsheet to crew, pick up jibsheet and settle in to new tack	6) Take mainsheet from helm and settle in to new tack

Expanded Displacement Tack (Helm)

- 1) Same as wire-to-wire version.
- 2) Same as wire-to-wire version, except helm may already be holding mainsheet.
- 3) Similar to wire-to-wire version. Important to enter tack with the same heel angle the boat was carrying in straight-line mode. In rare conditions, slight leeward heel may be added to encourage the boat to head up into the tack.
- 4) Similar to wire-to-wire version. The lighter the breeze, the more the helm will want to delay crossing to the new side, to allow the sail to fill on the new side and a decent amount of new leeward heel to develop (to pump down on the new side). The helm will release 2-4 inches of mainsheet during the cross.
- 5) Helm may need to help the crew flatten out the boat on the new tack (at the very least they shouldn't be working against the crew). As the boat comes flat, the helm should sheet in block-to-block and may need to scooch their lower body back into the boat to avoid over-flattening.

Exchange is the same as the wire-to-wire version. Sit down gently with shoulder at shroud (sitting down roughly ruins momentum).

- 6) Helm hands mainsheet back to crew (or hangs on to it if preferred), picks up jib sheet and re-trims if needed. Adjust body position, controls, sheet tension and settle in to new tack. CHECK TO MAKE SURE TOP BATTEN HAS POPPED.

Expanded Displacement Tack (Crew)

- 1) Same as wire-to-wire version.
- 2) Pass mainsheet to helm, stand up with feet on rail and thwart and hands on mast.
- 3) Hold your position as the boat turns, as the jib luffs pump boat to windward using the mast
- 4) Looking backward, cross the bow of the boat by stepping lightly over the jib tack line with the front foot first, moving both feet to the new rail, moving one hand to the new shroud while keeping the other on the mast. The jib will also be crossing at this point – try to avoid disrupting it as much as possible. In really light air, the jib car will get stuck on the top of the spinnaker sock and the crew will need to use their foot to kick it over to the new leeward side.
- 5) Be patient to let the sails set on new side, then pump mast and shroud to windward, easing body weight back in as boat flattens. If coordinated well with the helm, this should pop the mainsail battens and give the boat a small pump for propulsion out of the tack.
- 6) Move gently to your crew position on the new side, take the mainsheet from the helm (if they want to hang on to it for better feel, take the jibsheet and re-trim as necessary), and settle into the new tack. IN LIGHT AIR, THE JIB LEECH LIKES TO GET CAUGHT ON THE FRONT EDGE OF THE SPRADERS – IT IS THE CREW’S JOB TO CHECK TO MAKE SURE IT HAS BEEN FREED.

Additional Tacking Tips:

- Both crew and helm should try to use fewer, bigger steps to cross the boat
- In waves, the helm should look to turn the boat in a flat spot
- Additional video support can be found:
 - On –water video:
<http://www.youtube.com/watch?v=S-ixlGi3AmI>
 - Shore drill :
<http://www.youtube.com/watch?v=A1fKay9LLkI>

29er Gybing

Two gybing versions are presented below. The first is the version teams will need to use when the crew is on trapeze. The second is the version teams will need to use when the crew is not on the wire.

Simplified Wire-to-Wire Gybe

Helm	Crew
1) Prepare for gybe – “ready to gybe?”	1) Sight new sheet and acknowledge – “Ready”
2) Pull tiller gently to initiate turn down with speed	2) Swing in and unclip as boat turns down, keeping tension on spin sheet
3) Pull mainsheet in as mainsail starts to unload, giving it a tug as leech crosses	3) As boom crosses, tug on old sheet, let it go and pull around the kite with the new sheet
4) Cross boat quickly, smoothly, and looking forward, letting 2-4 feet of mainsheet out	4) Cross under boom looking forward, with new aft hand holding new sheet and picking up new trap wire with new forward hand
5) Exchange tiller and mainsheet hands	5) Swing out straight arm, front foot first
6) Move back, get feet under hiking straps & settle in to new gybe	6) Move back, clip in with aft (sheeting) hand and settle in to new gybe

Expanded Wire-to-Wire Gybe (Helm)

- 1) In preparation for the gybe the helm needs to do a quick check to see if they are clear of other boats and needs to get their feet ready to move (removing back foot from hiking strap...also if using a long single tiller extension, the helm may need to “pre-gybe” the extension to prevent it from getting caught up in the mainsheet...this is done by pointing the outboard end to leeward before starting to gybe). Most important in the prep phase is for the helm to check that the boat is flat and going maximum speed, as a heeled or slow gybe has a greater chance of capsize. Obviously, the helm needs to communicate with the crew their intention to gybe.
- 2) To initiate the gybe, the helm will gently pull the tiller to windward (pulling the tiller too sharply will cause a very quick rate of turn and the boat will capsize). Different rates of turn work in different conditions – both crew members need to practice to get their timing right for each.
- 3) As long as the boat is moving at full speed entering the gybe, the mainsail will unload as the boat turns down. The helm will take up the mainsheet slack as this happens, then give the mainsheet a sharp tug at the moment the leech starts to invert – this will cause the boom to cross. This tug is critical to completing the gybe – without it the helm may have to turn too far to get the boom to cross, risking a death roll to windward, or a broach when the boat finally does gybe.
- 4) Looking forward, the helm crosses boat with light steps as follows: Aft foot out of strap, shifting weight off bum and onto feet as boat unloads; old aft foot crosses boat first, preferably to far side of centre bar; turn facing forward and bring old front foot to new aft position. As you do this final step the helm releases some mainsheet, partially to facilitate the exchange (in the next step), but more significantly to control the heel angle exiting the tack (too much mainsheet on exiting the tack will cause excessive heel, slow re-acceleration, and a possible capsize. The amount of mainsheet released is breeze dependant (more eased in heavier winds).
- 5) Exchange tiller and mainsheet by bringing old forward hand (loosely holding the mainsheet) back to the tiller, grabbing both the tiller and mainsheet with this new aft hand, then letting go of the tiller with the old aft hand to grab the mainsheet.
- 6) Sit down and get feet under hiking straps. Adjust body weight as needed and settle into the new gybe.

Expanded Wire-to-Wire Gybe (Crew)

- 1) Before the gybe, take a look at the new spin sheet on the windward side. It can get knots or pulled out of the boat with a wave. You may also want to sneak your aft hand up the old spin sheet a bit as this will help keep tension in the next step of the gybe. If you and the new spin sheet are ready to go, get your forward hand on the trapeze puck and let your helm know you're ready to gybe.
- 2) A) As the boat turns down, swing forward and in, pulling yourself up on the trapeze puck and entering the boat. This should automatically disengage your harness hook from the trapeze bale, but just to be safe every crew should get into the habit of brushing their forward hand down their stomach when they let go of the old trapeze wire – to check that they have successfully unclipped. Footwork will vary depending on the wind and wave condition, try to enter the boat smoothly, and get your feet spread apart early for a good base of support (and to help get under the boom). Make sure to enter with weight on the windward side as entering the boat too far to leeward causes the boat to heel to leeward and makes for a very difficult and dangerous gybe.
B) It is also very important for the crew to keep spin sheet tension taut when they enter the boat in a gybe – letting the sheet run out causes the spinnaker to lose power and fly out in front of the boat, causing two problems: 1) Losing spinnaker power loads up the mainsail and increases the chance of a capsize; 2) when the spinnaker flies out in front of the boat it has a greater chance of getting hour-glassed (twisted up) or filling at an opportune moment, causing a pitch-pole. To keep spin sheet taut the crew should pull the spin sheet over their head (with aft hand) when entering the boat, then when in the boat re-grab with the front hand lower down the sheet to re-grab with the aft hand for the final tug on the old sheet (next step).
- 3) As the boom begins to cross, get your old front hand on the new spin sheet, then give a good tug on the old spin sheet with your old aft hand. This causes the spinnaker to collapse and makes it easier

to control when bringing it around to the new side. Pull the spinnaker around with the new sheet as you move to the new windward side.

- 4) Depending on the breeze, you will cross and move back immediately to the new side before the sail fills on the new side (windy), or take 3 pulls on the new sheet before crossing (lighter). Try to cross under the boom looking forward, with new aft hand holding new sheet and picking up new trap wire with new forward hand. Footwork will depend on wind and wave conditions.
- 5) Hanging straight arm (front hand) from the trapeze, swing out on the rail while bringing the spin sheet with you in your aft hand. Be careful not to over-sheet the spinnaker as you swing out (you may have to let it slide through your aft hand a bit or let it out once you have clipped in on the new side).
- 6) Once both feet are on the rail, move back if necessary and clip in with aft (sheeting) hand. Make any spin sheet, trap height, or body position adjustment as necessary and settle in to new gybe.

Simplified Displacement (non-wire light air) Gybe

Helm	Crew
1) Prepare for gybe – “ready to gybe?”	1) Sight new sheet and acknowledge – “Ready”
2) Pull tiller gently to initiate turn down with speed	2) As boat turns down, stay on the old side ready to move, keeping tension on spin sheet
3) Pull mainsheet in as mainsail starts to unload	3) As boom crosses, tug on old sheet, let it go and pull around the kite with the new sheet
4) As boom comes over, cross boat smoothly and looking forward, and get your old forward hand on the mainsheet block or on top of the boom on the new side	4) As sails set on the new gybe, cross under boom with gentle steps and looking forward, with new aft hand holding new sheet
5) As the sails fill on the new side, jerk the boom to windward to pop the battens**, then let out 2-4 feet of mainsheet	5) Help helm flatten boat if needed, sliding in to new position as boat comes flat
6) Exchange tiller & mainsheet and settle in to new gybe.	6) Move forward and settle in to new gybe

Expanded Displacement Gybe (Helm)

- 1) In preparation for the gybe the helm needs to do a quick check to see if they are clear of other boats and needs to get their feet ready to move (in light air this means getting the feet tucked up under body). Most important in the prep phase is for the helm to check that the boat is going maximum speed.. Obviously, the helm needs to communicate with the crew their intention to gybe.
- 2) To initiate the gybe, the helm will pull the tiller to windward (slightly more than in trapeze conditions as the boat needs to get through “dead downwind” quickly to maintain momentum). Pulling the tiller too sharply is still no good as this causes the boat to stop, so you have to find the right medium amount.
- 3) As the boat turns down, stay on the leeward side a bit longer than usual to generate leeward heel on the new leeward side. Sheet in the sail a bit as it unloads.
- 4) As boom comes over, cross the boat smoothly and preferably looking forward. The key to this step is to get under the boom to the new windward side while getting your old forward hand either holding the top of the boom, or holding the mainsheet block on the boom on the new side (and still holding the mainsheet). How far over to the new side you go is wind-dependant, but you must make sure you have a stable enough base to pop the battens (as in the next step).
- 5) As the sail fills on the new side and the boat comes up to its new course, give a strong pull on the boom or mainsheet block to “pop” the mainsail battens for the new gybe, then let out the main 2-4 feet (remember you should still have the mainsheet in your “popping” hand). If the battens don’t pop the first time, wait until the boat settles in on the new gybe, then try again. Multiple back-to-back batten pop attempts absolutely kill valuable momentum/speed.

- 6) Exchange tiller as you would in the wire-to-wire gybe. Sit down gently (you will likely need to move forward in light air), make any necessary body position or sheet adjustments and settle into the new gybe.

Expanded Displacement Gybe (Crew)

- 1) Before the gybe, you will likely be sitting in a position on the thwart and near the mast. If so, smoothly without disturbing heel angle or sail shape, move to a position behind the thwart looking forward and in a wide-stance squat. Old aft hand should be holding the old spin sheet. Old front hand will be holding the new spin sheet with most or all of the slack taken out of it.
- 2) As the boat turns down, keep your weight on the old leeward side to help the turn and generate leeward heel on the new windward side.
- 3) As the boom crosses, give a good tug on the old spin sheet, drop it, then quickly pull the spinnaker through with the new sheet. The initial tug will help invert the kite and make it easier to pass through the space between the luff of the spinnaker and the luff of the jib. Your wide stance from step 1 should give you the confidence to stay on the old windward side longer in this step as it will allow you to move under the boom quickly and smoothly.
- 4) As the sails set on the new side, cross the boat smoothly by shifting your weight onto the foot that will be on the new windward side, then bringing the old windward side foot over to follow (rate and length of cross is wind-dependant). New spin sheet should now be in new aft hand. It is very important in this stage that the crew stays low as the helm will be “popping” the battens at this point – if the crew gets in the way the battens won’t pop.
- 5) The crew should be ready to grab the trapeze puck with their new (free) forward hand in case too much leeward heel develops and the helm needs help flattening the boat. If helping the helm flatten, be aware you will likely need to move back inboard as the boat becomes flat, so as to avoid over-flattening the boat.
- 6) Move forward, let out the spin sheet for power, and settle into the new gybe. Once stable on the new course, if the helm hasn’t been able to pop the battens, you may need to adjust your weight to help balance the boat for the second attempt.

***Note: Advanced crews may gybe in front of the mast to keep weight forward, but will be facing backwards and will have to juggle the sheets around the mast (as they are rigged behind the mast).

Bearing off (& hoist)

Bearing off is a key skiff skill and needs to be mastered with and without the spinnaker. The basic manouever is below, with adjustments for different wind conditions and a gybe-set hoist to follow.

Skiff Bear off (& hoist)

Helm	Crew
1) Switch jibsheet with crew	1) Switch mainsheet with helm
2) Keep boat flat while crew adjusts controls	2) Ease vang & Cunningham for rounding
3) Use mainsheet to keep boat flat or heeled to windward before rounding	3) Uncleat jib but keep tension on jibsheet. Trap hard with hand ready on trap handle.
4) Pull tiller to windward and sheet out main to round down	4) As boat rounds down, swing into boat, let out jibsheet and cleat it.
If hoisting the spinnaker add the steps below:	
5) Hike and adjust mainsheet as necessary to keep a stable heel angle while the crew hoists	5) Hoist spinnaker from wind-appropriate position
6) Adjust mainsheet and body position to crew, steer up to fill spinnaker, and settle into new downwind course	6) Grab spinnaker sheet, get into appropriate body position, and settle into new downwind course

Light wind adjustments to bear off and hoist:

- Crew will not be on wire, but rather will be at or in front of mast before the hoist. As a result in steps 3 and 4 they may be hiking out with their shoulders, then moving behind the mast as the boat rounds down.
- In light air the team will want to establish slight leeward heel is step 5 to keep the boom to leeward, allow the spinnaker to fill, and otherwise keep the boat tracking after the boat has rounded down. To achieve this, the helm may be standing or squatting inboard, and the crew may have one foot to leeward of the center rail, the other just below the windward rail.
- The helm will want to steer slightly higher than they do in planing conditions during the hoist (steering too low in light air causes the boat to lose all power and heel to windward).
- Both team members will have to move forward after the hoist.

Medium wind adjustments to bear off and hoist:

- As the hoist nears completion and the crew begins to go for the spinnaker sheet, the helm needs to give a clear command about crew position after the hoist (full trapeze, trapeze in the boat or sitting in). This is because in medium air the crew's weight distribution will have a big effect on the downwind angle the helm wishes to steer – to sail deep helms will need the crew to be more inboard, to sail high helms will need crews to be more outboard on trapeze.

Heavy wind adjustments to bear off and hoist:

- The boat will absolutely need to be flat or heeled to windward AND moving at full speed to give it a chance to bear away. If the boat is not flat or not moving full speed, it will heel to leeward and round up when the helm tries to bear off. So in preparation for the bear away the crew should be trapezing hard and the team needs to verbally check in to confirm they are flat and fast before starting the manoeuvre.
- Adjusting sail controls before the bear away will cause the boat to slow down as the crew leans in and the sail shape changes in the main. It may be safer and quicker to leave the vang and Cunningham on to maintain the speed before the rounding (then adjust them after the bear away), OR adjust them earlier before the bear away to allow time to re-build speed.
- To achieve a flat or windward heel angle, the helm can ease the mainsheet to lower the windward gunwhale, then pull it back in to maintain heel angle.
- As the boat bears away the crew will need to move aft on trapeze to prevent the bow from digging in, then swing in.
- The jib must be uncled before and eased during the bear away. In heavy winds a cled jib drives the bow down for an almost guaranteed capsize.
- Waves will be a significant factor and both team members will likely be as far back in the boat as they can get during the manoeuvre. The team may need to pick a wave to surf to initiate the bear away. The team needs to keep being aware of the bow relative to the waves as the hoist is started.
- The most common mistake in big breeze is for the crew to come in too early and go immediately for the hoist after bearing away, either causing leeward heel to develop and the boat to round up, or sinking the bow into a wave and causing a capsize. Often the crew needs to postpone their hoist until the boat is fully downwind, bow free of waves and in control.
- Another common mistake is for the crew to come in too fast or too far to leeward when they enter the boat, causing the boat to angle to leeward quickly, often causing a capsize. The crew needs to come in smoothly to match the rate of turn, then set up with bent knees and a wide stance to avoid falling all over the place due to waves during the hoist.
- The helm needs to steer low enough to allow the spinnaker to go up freely hidden behind the mainsail, but not so low as to pitch-pole (steering too high during the hoist will likely cause a capsize when the spinnaker fills, and often causes the halyard block at the top of the mast to jam,

or at least wear away). To achieve this balance, the helm needs to hike hard and aft while playing the main and tiller to avoid waves when sailing low.

- Crew can go immediately to wire once they have hoisted and have the spin sheet.

All-wind Hoisting tips:

- The priority is always: 1st - Bear away, 2nd - Hoist...make sure the boat is moving well on the new downwind course before going for the hoist.
- A good hoist often depends on the ability of the helm to provide a stable operating platform for the crew while they hoist.
- Very little rudder should be used in the bear-away if the heel angle is correct
- Good communication helps, especially the helm letting the crew know how far the spinnaker is up the hoist ("spreader"; "almost there"; "up!").
- If the spinnaker ever becomes "shrimped" (dropped in the water to act as a parking brake), the crew should head immediately to the trapeze while the helm immediately turns the boat up onto a luffing close-reach course. This will stop the boat in a controlled manner and take the water pressure off the spinnaker enough for the crew to pull it back into the boat.

Advanced: The Gybe-Set

A gybe-set is what you call rounding down, gybing, then hoisting. In a race with marks to port this would mean rounding on starboard and gybing to port immediately during the hoist. It is an important skill to have as a skiff sailor and follows most of the same steps as a regular hoist except the following:

- The helm and crew use the speed gained in the rounding to keep the mainsail unloaded and gybe right away. Bearing away, waiting, then gybing is more difficult as the boat slows down and the mainsail loads up, creating speed and capsize problems.
- The helm will be performing the steps as described in the gybing section earlier.
- The crew needs to stay very low during the hoist to allow the boom to cross over (and in light air gybe-hoists, the helm to pop the mainsail battens on the new side).
- The crew will need to shift weight to the new windward side during the hoist.
- The helm will need to steer the boat slightly lower than a normal hoist to allow the spinnaker to travel around the outside of the jib (and not get stuck in between the forestay and the mast).
- The crew will need to pull the spinnaker around the front of the jib to the new side.
- Ideally, the crew will start the hoist after the round down, but before the boom crosses to maximize the amount of time the boat will spend deep downwind (making it easier to pull up the spinnaker, and allowing the wind to blow the spinnaker in front of the jib). This is more difficult in windier conditions, where the crew will need to be ready to hit the wire when the mainsail fills on the new side - whether the spinnaker is hoisted or not!

Spinnaker Drop and Heading Up

Heading up is a key skiff skill and needs to be mastered with and without a spinnaker drop (or "douse"). The basic manouever is below, with adjustments for different wind conditions and a gybe-drop to follow.

Skiff (Drop &) Heading up:

Helm	Crew
1) Communicate timing of drop with crew	1) Acknowledge timing of drop
2) Keep boat flat while crew swings in	2) Swing in smoothly, keeping sheet tension
3) Adjust weight and mainsheet to compensate for decrease in power as the spinnaker drops	3) Take out retrieval line slack, uncleat spin halyard, and with quick, aggressive pulls, pull down spinnaker. As spinnaker loads up at mouth of spin sock, take 1-3 big strong pulls with legs to get spinnaker in the sock
If there is no spinnaker begin with the steps below:	
4) ONLY when crew is ready, initiate turn to head up. Follow turn with hand-over-hand mainsheeting	4) Cleat jib to close-reach course, grab trap wire with front hand and swing out to keep boat flat as boat turns up
5) Keep boat balanced as crew adjusts sail controls.	5) With boat on new course, adjust Cunningham & vang
6) Hand mainsheet to crew, pick up jibsheet and trim to close-hauled course. Adjust body position, sheeting, and clean up spin sheets as necessary, and settle into new course.	6) Take mainsheet from helm, make any body position adjustments necessary and settle into new course.

Light wind adjustments to drop & head up:

- As clean flow produces speed, movements must be very gentle during the drop so as not to disrupt airflow over the sails or water flow over the foils.
- Make sure to maintain a slight leeward heel through all parts of the manoeuvre.
- Allow an extra bit of slight leeward heel to develop at the start of the turn, this extra heel can be flattened by the crew and help to provide an extra squirt of speed at the end of the turn.
- When flattening the leeward heel, be careful not to over-flatten. The crew and helm will have to move back inboard when the boat approaches a "flat" heel angle.
- Cunningham and vang do not need to be put on after the rounding, nor does the crew need to go on the trapeze.
- Make sure both crew members move forward after the turn up (helm with shoulder at shroud, crew in front of shroud near mast on thwart).
- Helms may prefer to hold on to the mainsheet after the rounding.

Medium wind adjustments to drop & head up:

- Follow steps as outlined above. No adjustments needed.

Heavy wind adjustments to drop & head up:

- Very important to keep the spinnaker sheet taut, or even over-trim the spin sheet when the crew moves into the boat for the drop. Otherwise, the spinnaker flies out in front and can get tangled, or can cause a pitchpole if it fills again accidentally.
- Similar to the hoist, both team members need to be aware of waves relative to the bow. As with the hoist, helm needs to hike hard and play the main to avoid waves without throwing the crew around while they try to douse. The helm also needs to be proactive in yelling for the crew to come aft or hit the wire, if the helm thinks they will plough into a wave.
- The crew needs to have their weight on the wire before the turn up is begun. Otherwise, the boat will slow (and perhaps even capsize) as it heels to leeward in the turn. The objective should be a flat heel angle throughout the turn.

All-wind Dousing tips:

- Leeward marks come up quick, especially in windy conditions. Teams should be encouraged to err on the side of early vs. late spinnaker drops.
- The key to good spinnaker drops is often the helm's ability to keep the boat flat and stable, providing a good platform for the crew to do their work quickly. A common mistake is the helm heading up to early or trying to make a mark while the crew attempts to douse – this creates capsizes and causes the halyard block at the top of the mast to wear, and break.
- Good communication greatly helps timing – Helm: “Ready to douse”; “Go”; “Ready to Head up”; “Heading up”.
- The leeward marks are an area with a lot of traffic and poor visibility. Teams should anticipate problems with other boats before the drop and need to keep alert for other boats during the drop (with crews ready to leave the spinnaker to take emergency action on the trapeze at any time)
- If the spinnaker ever becomes “shrimped” (dropped in the water to act as a parking brake), the crew should head immediately to the trapeze while the helm immediately turns the boat up onto a luffing close-reach course. This will stop the boat in a controlled manner and take the water pressure off the spinnaker enough for the crew to pull it back into the boat. Pulling a “shrimped” spinnaker back into the boat at speed risks ripping the spinnaker.

Advanced: The Gybe-Drop

Teams need to be able to round both leeward gates coming from both port and starboard gybe. The “standard” drop and round up described above works for an approach on starboard gybe rounding to starboard and port gybe rounding to port (although the spinnaker needs to be pulled around the jib from the leeward side to the spin sock on the windward side when rounding to port). The gybe-drop is the manoeuvre used to round to a gate mark from the opposite gybe (port gybe rounding to starboard and vice versa). All the same steps apply as a regular drop except:

- Both helm and crew will follow the steps outlined in the gybing section to begin the manoeuvre. And switch to the steps outlined above in the drop section to finish the manoeuvre.
- Instead of gybing the spinnaker sheets, the crew will be dropping the spinnaker into the spinnaker sock. Rounding the left gate to port the crew will hold the old spin sheet on, which will cause the spinnaker to collapse into the jib and slide down into the spin sock easily. Rounding the right gate to starboard the crew needs to release the old sheet to allow it to float to the port side of the boat during the gybe so that it can be recovered in the spin sock on the port side.
- The crew needs to move to the new windward side in the middle of the drop to balance the mainsail loading up after the gybe. In windier conditions they may need to get a quick pump on the new trapeze wire to get the boat flat as they finish the douse.

Capsize Recovery

When skiffs capsize, they often go turtle quickly and can be difficult to re-right. In light-medium winds, it may be possible to re-right the boat with the mast facing downwind, but as the wind increases, teams will need to use the wind to help get the boat up, so the mast will need to face to windward during capsize recovery. Two methods are shown here: Light-Medium and “Scoop” method for windier conditions.

Light-Medium Recovery:

1. Make sure your team mate is O.K., that they are not tangled in any lines
2. If the boat is turtled, both stand on the windward gunwhale (it will be in the water upside down), hold onto the daggerboard and lean out until the mast is parallel to the water. Alternatively, one team member can hold onto the daggerboard while the other hangs off the first teammate (for stronger teams only).
3. When the mast becomes parallel with the water, have the heavier team member climb onto the daggerboard (to make sure it doesn't turtle again), while the other team member makes sure the spinnaker is doused and the jib is uncleated.
4. Both crew members will then be needed to stand on the daggerboard to get the boat upright. If necessary, one of the team members can hold onto a spinnaker sheet for balance to lean out a bit.
5. The boat will come up slowly at first, then quickly as the water drains off the mainsail. As the boat gets back up, make sure you communicate to try to get both team members in the boat at the same time (crew will go over the front to hang onto the mast as it comes upright; skipper will go over the back to grab the tiller). At least one crew member needs to haul themselves in as the boat comes upright, otherwise it will likely capsize again.
6. The first person in the boat should grab the tiller (it will often be tangled in the mainsheet and bridle), then pull the jib on a little to get the boat stable. If both team members are in the boat at the same time, the crew should stay at the mast to keep the boat balanced. If one crew member is in the water, the other helps them in. The easiest way to do this is for the person in the boat (holding the tiller and mainsheet loose, with small amount of jib on) to sink the windward gunwhale slightly into the water so the other team member can effortlessly float in, then the member in the boat can either sheet in or step a bit to leeward to lift them out of the water.

"Scoop" Recovery for windier conditions

1. Make sure your team mate is O.K., that they are not tangled in any lines. It will likely be difficult to hear each other with more wind, so you may have to shout.
2. In breeze, boat will most likely be turtled. Both team members step on the LEEWARD gunwhale this time, holding the daggerboard to bring the mast up to windward of the boat.
3. As the mast comes parallel with the water, have the lighter of the team members swim around, douse the spinnaker (if necessary), uncleat the jib, and ensure the tiller is not tangled in the mainsheet. The crew member on the daggerboard may have to juggle keeping weight on the daggerboard vs. weight on the mast (as the wind pushing onto the deck will want to re-right the boat prematurely). The team member in the water will fish the trapeze wire out of the water on the underwater side and hold it in their forward hand (if they want to get fancy they can fish out the tiller extension or jib sheet with their back hand as well).
4. When ready, the team member on the board leans on the board to get the mast tip out of the water. When the mainsail catches the wind, the boat will come up very quickly, but the crew in the water will be "scooped" onto the new windward side and will use their weight to keep the boat from capsizing over to leeward again – using the fished trapeze wire if necessary. The team member on the board, if very quick, can dance over the rail as the boat begins to right (watch your head on the boom!). Alternatively, the team member on the board can "San Fransisco Roll" by holding onto the daggerboard as the boat goes upright, then letting go of the board when underwater and swimming to the new windward side (always hold on to the boat in windy conditions otherwise it might drift away).
5. Once the boat becomes flat, the sails will be flapping, and the team member in the boat needs to quickly grab the tiller and put on a little bit of jib to stabilize the boat. They can then help the other team member into the boat.

***Note: In really heavy air even the scoop method will not work – one team member will need to be on the board, while the other will hold onto the bow while the boat is righted (mast first into the wind).

The team member in the water at the bow will act as a sea anchor holding the bow into the wind while the team member on the board needs to be quick over the rail as the boat comes upright, then gets the boat balanced and stabilized with tiller and jib. The crew in the water will then work their way down the windward rail from the bow to be helped in the boat.

***Note: It is common for 29er and 49er jib battens to break during capsize. This may be due to the violence of a pitchpole, but is often caused by the jib wrapping around the forestay while the boat is in the water. If at all possible, the crew in the water should try to keep some tension on the jibsheet to avoid this problem. On very windy days, a capsize will also often cause trapeze bungee to break.

Start Line: Accelerations

There are many skills to be learned on skiff start lines, among them double tacking, (legal) crabwalking, and bailing out of bad situations. At the basic level however, the coach must focus on start line accelerations – getting the boat moving from stopped to top speed as quick as possible. Described below is one technique for skiffs..

Acceleration Preparation – sitting in one place and in control

- Set the vang to its upwind setting. Make sure cunningham and outhaul are also set correctly for the conditions so you will not have to adjust them in the crucial 2 minutes after the start.
- Sit the bow pretty high into the wind (without being in irons) to avoid the vang engaging and pulling you forward over the line. The boat should be flat with crew weight centralised forward – at slow speeds any heel to windward or leeward, or excessive weight aft causes the boat to drift sideways and round up into irons, causing a multitude of problems.
- The helm will be standing half way between the transom and the mast with one hand on the boom or mainsheet block (and also holding the mainsheet loosely), and the other holding the tiller extension – depending on preference and wind condition the helm can have their forward hand on the tiller (steering behind the back), or their aft hand on the tiller (steering normally). The main should be luffing, with the helm occasionally inverting the battens to get the bow to fall off, or popping the battens to get the bow to head up.
- The crew will be squatting behind and to windward of the mast – low and forward enough to let the helm see clearly and manipulate the battens freely. The jib should be cleated for a close reach, which allows the helm to quickly bear off into the jib to move forward or acquire a little bit of speed. The crew should be ready to pull the jib car to windward if the helm calls for it (by pulling it from the windward side of the mast as opposed to pushing it from the leeward side of the mast). This will help get the bow back down to a close reach course if the boat is about to drift into irons.

Skiff Acceleration

<i>Helm</i>	<i>Crew</i>
1) Let go of boom (still holding onto mainsheet) and aggressively jam tiller to windward to get bow down and sails pulling.	1) Grab trapeze wire with front hand and move out as needed to keep boat flat
2) When boat starts moving forward, sheet in mainsheet hand over hand and head up to close reach	2) Clip in and let go of the trapeze wire
3) Hand mainsheet to crew and pick up jibsheet	3) Pick up mainsheet from helm and move to proper trapeze form for the wind condition.
4) Sheet in jibsheet while steering to close hauled.	4) Trim mainsheet to close hauled course
5) Make necessary body or sheeting adjustments and settle into new course	5) Make any necessary adjustments and settle in to new course

Acceleration tips for different wind conditions:

- In light air, leeward heel can be added by the team after step 1. This leeward heel will be flattened by the team for a speed squirt in step 2.
- Naturally in lighter winds the crew will not be on the wire. Instead for step 2 they can stand on the thwart or gunwhale and pump the boat flat holding on to the mast and shroud.
- In light air teams will flatten aggressively to flick leech and propel the boat forward, then will move inboard if necessary to avoid over-flatten. The helm will sheet in as boat becomes flat, and should beware of sheeting in too far before flattening, as when the team attempts to flatten the boat will only move sideways – a common mistake for new sailors.
- In light air, the helm will likely sit down after step 2. In heavy air the helm will sit down and get into the hiking straps before step 2.
- In heavy air, the jib may need to be cleated further out than a close reach and the crew may need to stand to windward to keep the boat level.
- In heavy air, the crew will need to move outboard before the helm turns the boat down, otherwise excessive leeward heel will develop.

Acceleration Tips for coaches:

- Coaches are encouraged to make sailors concentrate on looking forward...not messing around with controls or looking back, during the crucial 2-minute post-acceleration period.
- Once your sailors have the basic acceleration skills, have them practice being close to other boats either side of them during acceleration drills, as is the way with most big fleet starts.
- A reminder to get your sailors to flatten, then sheet shortly after the boat comes flat, not other way around!

Conclusion/Wrap-up:

Hopefully, this manual was helpful in aiding Canadian Club and Provincial level coaches to understand the important base technical skills required to sail skiff-type boats properly. Being able to transfer to your athletes a strong base set of skills will put them in a great position to enjoy their skiff sailing and potentially join a regional center training groups to further develop their skills.

Again, it should be noted that styles and techniques sometimes change with personal preferences, gradually over time, with equipment changes, and most significantly with changing body size/shape of sailors as they age. The styles and techniques presented in this manual are simply one good, proven version for beginner and intermediate sailors to build a base off. Any additions or changes to this manual are welcomed and may be included in regular updates of this manual.

Good luck with your upcoming training and feel free to get in touch if you have any questions!

Cheers,

Rob Fox (robwfox@gmail.com)

Matt Dubreucq (matthieudubreucq@gmail.com)

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