Dart Sails and Covers

HUNTER IMPALA 28 OOD

TUNING GUIDE

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INTRODUCTION

The Impala is now over 40 years old, and we have been involved with them for over two decades. Both directors here have won the Impala National Championships, and four of the team members here have owned an Impala. Sean won 4 National Championships and various other regattas in the early 2000's and Dom won the 2022 National championships as well as numerous regattas with Impulsive. The vast amount of time on the water and development over the years means we are confident that we can supply the best Impala sails on the market and hopefully pass on some useful tips. This guide is designed to be as ''all purpose'' as possible. It provides you with information on boat preparation, tuning tips, and other helpful guidance to help you get the most out of these fantastic boats.

BOAT PREPARATION

The primary goals of boat preparation are to increase acceleration and top speed. One of the easiest and cheapest ways of doing this is to remove as much excess weight from the boat as possible. This will lighten the boat improving acceleration. It will also make the boat float slightly higher reducing the wetted surface area which will help to reduce drag. Try to get as much weight out of the ends and if possible, keep everything low and central around the keel. This will help to reduce the see-sawing over waves.

DECK LAYOUT

For windward leewards in particular, you want to try and get all 6 of your crew to be helping with a manoeuvre at the same time. Consider rearranging or moving cleats/clutches/halyard exits if you find your pit person is forever wrapped up in halyards/sheets with a queue of people waiting for the coachroof winches. As we know that the windward mark should be a port rounding it is possible to set the boat up to assist with port roundings. (We know that you may want to Gybe set but it's not usually as fast as a straight set with an early gybe). Of course, Windward/ Leewards may not be your primary concern so some of this may not suit your sailing, if you sail shorthanded for instance then some of this won't be practical. If you sail around the cans 5-6 up, then I'm confident that some of this will help you.

- **Spin halyard** should come out of the starboard side of the mast with a jammer on the mast allowing the sail to be hoisted from the side deck/mast if needed. Leave the halyard routed back to a clutch, the halyard can be tailed back later or left coiled up on the deck.

- **Kicker** – does that need to come back? How about a swivel Jammer just behind the base of the mast for mast person to deal with from either side of the boat.

- **Outhaul** – same as kicker leaving it forward gives it to the mast person to do instead of pit. We had ours come out of the bottom of the boom and onto a jammer, so it was adjusted from the front underside of the boom.

- **Uphaul** on a swivel jammer on the starboard side of the boat next to the kicker Jammer.

- **Antal Genoa turning blocks** have a spring-loaded Jammer that can hold the genoa sheet. They can help on spinnaker hoists as they can hold a genoa sheet for a while freeing up a primary winch which the spinnaker sheets might need or be using. They really are a beautiful thing and highly recommended.

- **Mainsheet system** – We recommend a 4:1 Coarse tune with a 16:1 fine tune. Can the driver easily use and manage the mainsheet? We fitted a swivel mainsheet jammer behind the main track with a fine tune in front of the track. This made playing the mainsheet far easier, which also means it gets played more often.

- **Harken windward sheeting mainsheet system**. If budget allows these things are ''better than sliced bread'' That comes from the Class captain Ben Meakins too.

HULL

Now that the Impala is 40 years old many have an excess build-up of old antifoul on the bottom. Lumps/bumps and craters from years of build-up/flaking paint will only add drag and reduce the boat's performance. Ideally removing all of the old antifoul, re-fairing the hull and applying a couple of smooth coats of antifoul would be best. But it's a lot of work and speaking from experience if you have the old AF removed via shot blasting it takes a huge number of hours to fill, fair and sand back. In the winter, some wet and dry on a sanding block would work wonders and help to stop building up lumps and bumps. A few pairs of hands and a few hours here and there would make a reasonable difference over the winter period.

There is much help and advice online about sanding and fairing a hull. There are also professionals who can help with this if the budget allows for some assistance with this.

STEPPING AND TUNING THE MAST

Most Impalas use 6mm 1x19 or 6mm Dyform shrouds. The class rules allow smaller 5mm shrouds, but these will stretch in stronger winds. We recommend 6mm Dyform, our rig tension guide is based on this.

CENTRE THE MAST

It is important to have the rig upright and centred in the boat from port to starboard. To check this, set the upper shrouds to 20 on the loos gauge and the lower shrouds hand tight. Attach a tape measure to the genoa halyard and hoist it to the top. Measure down to a fixed point on the port and starboard side of the boat; adjust the upper shrouds until you get the same measurement either side. Chainplates and stanchion bases are pretty good places to use for these measurements. Then adjust the lower shrouds to bring the middle of the mast into column, sighting up the back face of the mast is the best way to check this.

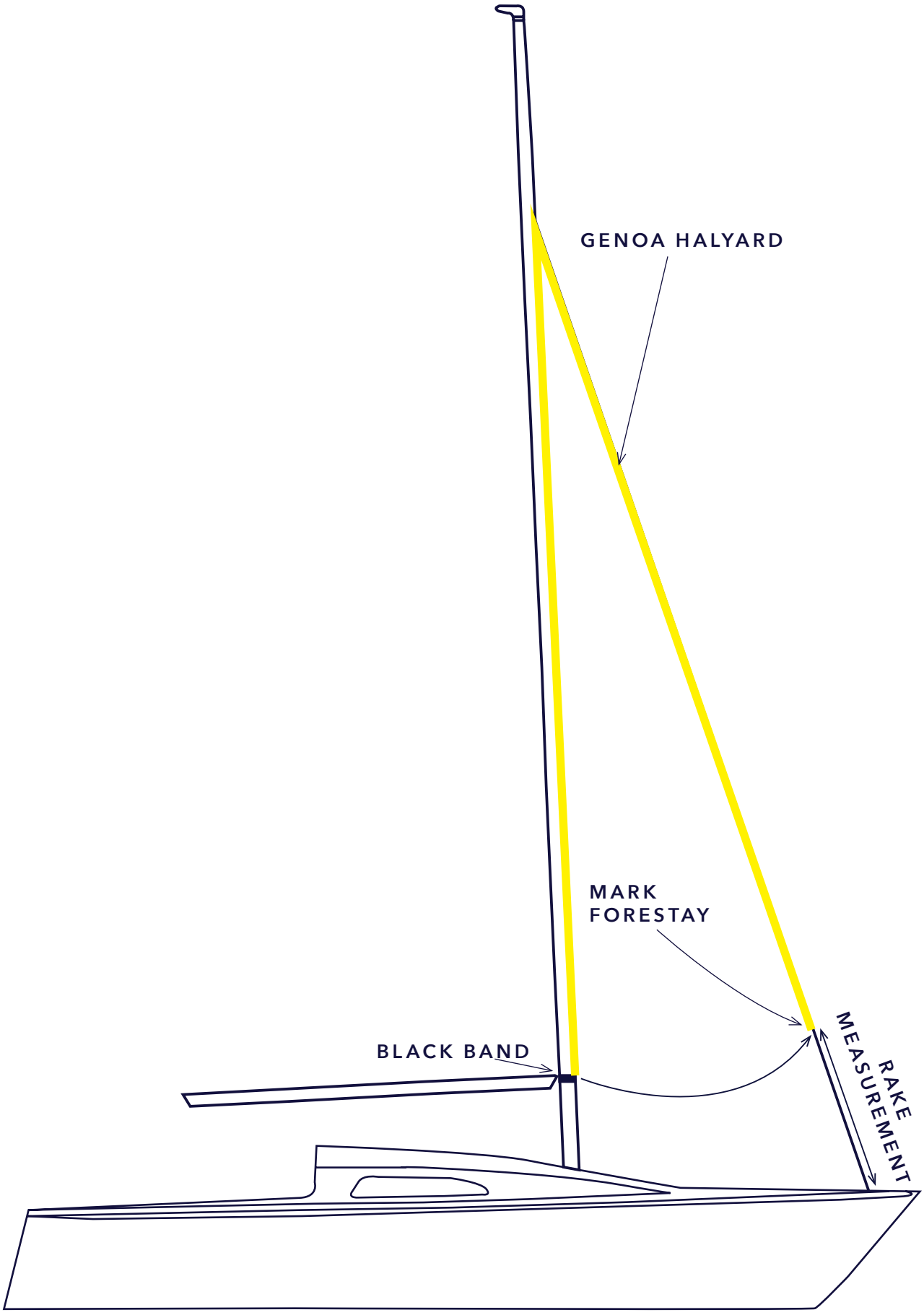
You should now have the mast upright in the boat and straight. It will still be quite slack, but this is needed before you can move onto checking the rake.

**Avoid using the main halyard to check the left/right measurements as the top of the mast may be off to one side until the lower shrouds have been adjusted and the mast is straight.*

MAST RAKE

Once the mast is centred and tensioned as above it's now time to measure and check the rake. For this ensure that kicker, backstay, and mainsheet are off. Take the genoa halyard and have it so the end of the closed snap shackle is in line with black band at the gooseneck; cleat/jam off the halyard so it is set at this point. Arc the halyard forward to the forestay and mark the forestay where the snap shackle lies under the same tension as it did when setting the halyard to the black band. Now measure from that mark on the forestay down to the forestay point where it intersects with the bomb doors. The regular rake should be 1.8m's. Something that is worth considering is having a 5 cm in length toggle that sits at the bottom of the forestay. For lighter winds we recommend shortening the forestay/rake measurement to 1.75m's, the easiest way of achieving this is to have a toggle in the systems so that when it is removed it shortens the forestay by 5cm achieving the 1.75m measurement.

**For one setting does all we recommend 1.775m which is halfway between the two. If you find you need a little more height, then increase to 1.8m. If you find that you have good height but lack a little speed, then drop this back to 1.75m. More rake = more pointing ability. Less rake = more speed. With the rake set to 1.8m we found that the boat had fantastic height but when trying to lean onto the sails for a little more speed or fetching it was reluctant.*


GENOA HALYARD
MARK
FORESTAY
BLACK BAND
RAKE
MEASUREMENT

SHROUD TENSIONS

For the best performance in each wind range, we adjust the shroud tensions by adjusting the rigging screws. Shroud tensions control the forestay sag and mast bend. The uppers control the Forestay tension and the lowers control the mast bend. As the wind increases, we want to increase the forestay tension to remove forestay sag and flatten off the Headsail. The lowers are used to control the mast bend balancing the forces of the Uppers and controls of the boat

LOOS GAUGE MODEL PT-2				
WIND SPEED KNOTS	UPPERS TENSION	½ TURNS FROM BASE	LOWERS TENSION	TURNS FROM BASE
0-6	20	-9	SLACK	-6
6-10	25	-6	10	-3
10-18 - BASE	33	0	17	0
18-25	37	+10	31	+13
25+	39	+13	32	+14

LOOS GAUGE MODEL B				
WIND SPEED KNOTS	UPPERS TENSION	½ TURNS FROM BASE	LOWERS TENSION	TURNS FROM BASE
0-6	24	-9	SLACK	-6
6-10	31	-6	15	-3
10-18 - BASE	36	0	25	0
18-25	41	+10	35	+13
25+	42	+13	36	+14

**Please check the turns between rig settings on your boat as your rigging screws may have a different thread pitch to the ones used when this was written. If different please start at base and work up and down from this counting the half turns to the desired tension on the gauge and use this as the turns between settings.*

***If one setting is to be used for all then we recommend using the 18-25 setting on the uppers with 10-18 on the Lowers. ''Imelda'' was set this way and won two national championships... (We know this contradicts our Tuning guide). This sacrificed some speed for height in the light winds and sacrificed some height for speed in the breeze. If you want one setting does all this is the one we recommend. If you are happy to play with the rig a little, then a good compromise would be to have the lowers set on 10 -18 knots and only move the uppers. Changing the uppers only between 10-18knots and 18-25knots. Effectively having 0-18 knots and 18knots+ uppers setting.*

LIGHT WIND TIPS

UPWIND

Acceleration and momentum are crucial in light winds. Impalas don't accelerate terribly well so it will help if you can carry some speed through the tack. Do NOT ever let the headsail back! Make sure the sheet is ready to go and have someone help it around if needed but don't force it around. A little rudder and making the turn slowly will help to keep some of the speed, definitely don't slam the helm down fully and throw it through the tack; it's super slow. Focus on boat speed, the top boats have the helm doing the mainsheet too. If you give this to two people, then the least that the mainsheet trimmer can do is focus on boat speed. Communication between the driver and mainsheet is crucial. It's important to find and learn the acceleration gear and speed gear in the light. Stay in acceleration gear until the boat speed has reached at least 70% of the boat speed you're looking for. Go for a sail before the race and get some rough numbers on boat speed. Then you'll know what speed you are trying to work towards. i.e. if top speed is 5.1 knots make sure you get to 3.6 before you pull the sails fully in. Stay in the slightly eased acceleration mode until the speeds are achieved before moving to strapped in height mode.

MAIN

Main twist is your friend in the light! Have the traveller at the very top of the track with the mainsheet eased lowering the boom onto the centre line. Use the kicker to set the maximum twist you ever want so you can't accidentally ease the mainsheet too much and over twist. With rod kickers/boom struts it is very easy to have too much force pushing the boom up and creating too much twist. Once the boat has accelerated apply a little more mainsheet bringing the boom slightly over centreline, this will bring the top batten of the mainsail in from around 10 degrees off centre to 5 degrees. Don't focus too much on the top tell-tale streaming.You'll be there all day trying to get it to fly and I'm not convinced it's any faster when it is flying.

GENOA

The Jury is out regarding genoa lead position in the light and appears to be different between boats and helm driving styles. We prefer putting the car forward a couple holes so that the leech would touch the spreader before the foot touches the chainplate, leaving about a 2-4'' gap at the foot. Then ease the sheet so that the leech is about 2'' off the spreader tip. We never pulled it in beyond this point. This contradicts every sail trim guide you'll ever read about the importance of getting the slot right and matching the genoa and main twist settings. Most guides will recommend bringing the genoa car position back a couple holes to twist off the genoa and match the main. I've seen both work and tended to find that in flat water the twist setting was best. But with a bit of chop the car forward forcing some additional shape into the genoa helped

the boat punch a bit of chop. Sorry! You may have to play with this but for 99% of the time we ran with car forward a couple holes. I've seen boats with car forward and car back around me and there was nothing in it. Interestingly it was an inboard boat that preferred car forward and an outboard boat that preferred car back.

DOWN WIND

A light weight 0.5 ounce or 0.6 ounce VMG spinnaker helps no end here. Keep the crew weight as forward as possible. Bow should be sat in front of the mast. Mast can sit by the leeward chainplates. Tactics leaning back against the boom. Trimmer stood forwards so they can see the spinnaker and the driver as far forward in the cockpit. Hotter angles down wind are needed to keep the boat speed up. The class rules only allow for a small spinnaker for the size of boat so you can't 180 degrees run it as it's incredibly slow. Make sure someone is looking back and spotting wind coming down and ensuring that another boat isn't trying to sit in your lane slowing you down. Having someone sitting on the coach roof looking back enables them to keep an eye on what's going on behind and they can look back in line with the Windex to see if the lane is open or if another boat is in line with your Windex. In which case you want to defend this by working up into clean wind, soaking into clean wind or gybing out.

MEDIUM WIND TIPS

UPWIND

As with the light wind tips, boat speed is crucial. Either the mainsheet trimmer or driver should be keeping an eye on boat speed. Target numbers are a great help, too slow and you need to ease sails or lean on them a bit to build speed. Too fast and you can grab some more mainsheet or genoa sheet to help point a little higher. Always try and go for a little sail before the race to check numbers and how you're doing against any competition out practising.

DOWN WIND

Exactly as light wind tips. Crew weight forward ''in the middle of the boat''. They don't tend to love sailing 180 but if you need to, then try a little windward heel. 165-170 is far better but if you need to soak to keep a clean lane or to avoid gybing for the leeward mark then it's OK short term. It is best avoided though. A spinnaker 5 Sqm's bigger is needed to be able to sail 180 efficiently, this is worth exploring if one design isn't your main concern and you're racing in a handicap or rating.

HEAVY WIND TIPS

UPWIND

Hike, hike and hike some more. Once you're up to top speed feather/pinch to maintain that speed. On a windward leeward course, we recommend dropping from the #1 Genoa to the #3 Jib at around 18knots. The increased speed in pulling the number 3 in and reduced healing moment means you can drop down to it sooner if you're crew is light, or you feel over pressed. In the 2019 Nationals one of the races was definitely number two weather, 16-18knots and a bit of sea. Most of the fleet went for a number two, only two boats hoisted a number 3, and they were both in the top 3 to the windward mark. However, and this contradicts everything we advise. Whilst competing in an Impala open in Ireland I noticed a competitor ''Alcyone'' with a reef and a number two. She went off like a rocket, although I'm unsure about this set up it does have its benefits. The reef makes the mainsheet easier to handle, if you have a poor mainsheet system then a full main will be hard work. If you have to reef to make the mainsheet manageable then the boats go really quite well with that and a number two. Personally, I've never had a number two onboard at an event. I opted for dropping the main down the track and pulling the mainsheet harder. I'd rather hold onto a full main for the additional sail area downwind.

Boat speed is still crucial. Either the mainsheet trimmer or driver should be keeping an eye on boat speed. Target numbers are a great help. Too slow and you need to ease sails or lean on them a bit to build speed. Too fast and you can grab some more mainsheet/backstay/genoa sheet to help point a little higher.

DOWN WIND

Downwind in 20+ Knots in an Impala is reasonably exciting. Not in a clouds of spray planning exciting. More IOR rolling whilst trying to keep the bow out of the water and rudder working kind of exciting. The reason the Impala rates so well under IRC is because she doesn't do fantastic numbers downwind so you're not being penalised for a boat capable of doing 16knots downwind. She is more than happy doing 6 knots upwind and quite happy doing 7.5 downwind. But that's about it! We've tried, believe me! 28 gusting 32 full main, full-size kite, wind at around 155-160 and we maybe touched 8.5 knots for a few seconds. They do slide down big waves though so you may get lucky with some big rollers. The Laser 28 will do them down wind, but they rate 15-20 points higher, you can't have it all. Low 20 knots true 180 deg is OK, bit of windward heel and she's golden. High 20's the 180 highway is pretty exciting and best avoided. Heat it up a little, they're much faster upright rather than upside down.

SAIL TRIM

NUMBER 1 GENOA

This starts by setting the car/lead position in 8-10 knots true. Set the sail so that the leech and foot touch the rigging at the same time. This is the default setting to work forwards or back from. It should be 7 holes from the back of the tack. The rule of thumb is, car forward forces additional shape into the sail, car back twists off the sail which is great for acceleration and de-powering when over pressed.

We found that we liked it in the one place (default) for most wind conditions, 7-8 knots +. As the wind increases it twists off a little by itself without moving the car as it's harder to get the leech in when it's got some pressure in it. Please see light wind trim in this guide for some (slightly mixed) helpful tips.

JIB

This is super easy, 3 holes showing from the front of the Jib track. Sheet eased a little until top speed is reached then winch it in as hard as you can. This should set the sail so that the leech and foot look evenly trimmed.

At around 25knots true it's worth dropping the jib car back one or two holes to twist off and de-power it. If you've gone to it early and feel a little under powered or the wind has dropped, then move the car forward 1 hole. 1 hole makes a huge difference on a small high aspect jib.

SPINNAKER

We have a few different spinnaker designs and recommend taking 3. A 0.5 ounce VMG, a 0.75 ounce AP and a 0.9 ounce heavy. All three are at class maximum area. The VMG is tall and thin without shoulders, the AP is a little shorter and fatter, taking area from the bottom and putting it out into the shoulders. The Heavy is actually the VMG design in a heavier weight fabric.

If you want a ''one does all'' then we recommend our VMG design in 0.6 ounce or 0.75 ounce.

In the light, lower the pole slightly to help support the front edge of the sail. As the breeze increases raise this to have the clews at the same height. Always have it eased so the top of the front edge is just flicking slightly as this shows it's eased enough.
In breeze consider some leeward tweaker to keep the top front edge back. Rolling downwind is caused by an imbalance in sail areas on either side of the boat. You have 39 square meters of spinnaker out one side and 21 square meters of mainsail area out the other.

As a starting point and to settle the boat down drop the pole forward putting the centre seam of the spinnaker in line with the forestay. This will put half of the spinnaker area on either side of the boat. Then work out from that bringing the pole back and easing the leeward tweaker off as your confidence, crew work and ability increase.

MAIN

This depends a little on your mainsheet system and size of the person pulling the mainsheet. We recommend getting a mainsheet swivel jammer fixed behind the main track and having a fine tune in front of the track. We fitted the mainsheet jammer to a piece of aluminium box section, filled with Delrin and bolting it to the underside of the main track. Originally the mainsheet was on the main traveller itself but when you ease the traveller in a gust the mainsheet disappears to leeward with it.

With a mainsheet swivel and fine tune you get 4:1 coarse tune and 16:1 fine tune. The fine tune enables more force to be applied which closes the leech and helps the boat to point. The other benefit of the 16:1 fine tune is that it's much lighter and easier to handle than the coarse tune so it's far easier to adjust. This also means it will get adjusted more often and will reduce the chances of the boat rounding up on a gust. I once eased the mainsheet on a 6:1 mainsheet in a gust and the mainsheet went with such force that it pulled me in and launched me to the leeward side, I had a hole in my knee that took weeks to heal.

CREW TASKS

DRIVER

- Drive
- Mainsheet
- Backstay
- Traveller

GENOA TRIM

- Trim Genoa
- Trim Spinnaker (Some prefer to have the tactician trim, we preferred to have the tactician looking around and working on the strategy down wind and looking for the best way on the next upwind).
- Checking performance against other boats (talking to the driver to find a higher or faster mode).

PIT

- Launch Spinnaker from cockpit bag
- Recover Spinnaker on drops
- Spinnaker Guy
- Genoa Halyard
- Tweakers in the Gybe

TACTICIAN

- Strategy
- Track wind direction/Shifts
- Call pressure/gusts
- Monitor boat speed/height against other boats
- Coordinate with driver to navigate around traffic
- COMMUNICATE! Ensure messages from the front or back of the boat reach the other end.

MAST

- Pole Uphaul
- Kicker
- Outhaul
- Pole Downhaul
- Cunningham
- Pull spinnaker around on hoist
- Human Guy for a windward drop

BOW

- Call Start
- Call waves
- Watch for traffic out of the front of the boat (Between the Driver and the Bow most of the leeward side of the boat is visible)
- Hoist Spinnaker from Mast (we preferred to have the bow put the pole up and step back onto the halyard leaving the mast person to move from pole uphaul to assisting with getting the guy around/easing kicker allowing the boat to bear away).

RATING OPTIMISATIONS

We believe it's worth sticking with the one design set up and sail plan. These really are fantastic boats that are okay in the light, fantastic in 10-18 knots and pretty good in 18+ knots.

We've helped a couple of boats in the past change the sail plan to suit their sailing and environment, so we are happy to discuss this further if you'd like to pop in, ring or drop us an e-mail.

What I will say is that it is definitely worth having the boat weighed and measured. These boats are all over 40 years old now and very unlikely to be at original weight. The additional weight will do the boat no favours, but it does appear to go a long way with most rating systems. Measuring bow and stern overhangs is essential too! ''Checkmate'' has been one of the most competitive boats in the last few years; Steve Goacher has claimed 3 National Championship victories at the helm. Yet despite this, ''Checkmate'' rated as one of the slowest in the fleet on IRC. Buying ''IRC optimised'' sails over getting the boat weighed and measured is like stepping over pounds for pennies.

Regarding IRC optimised headsails, we are not in favour. Reducing the rating by 2 points but making the boat 5 points slower is not an optimisation.

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