



produced by the

International 420 Class Association

in cooperation with Nikos Drougas



Performance Improvement for Coaches and Sailors

www.420sailing.org

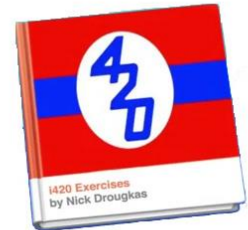
e-Book
Exercise



International 420 Class Association Exercise e-Book

Sailors are always looking for ways to improve their sailing techniques, improve manoeuvres and get the most out of the time spent on the water.

420 TO THE MAX - In 2011, the International 420 Class Association took a significant step in providing online training and development support, with the launch of “420 TO THE MAX” – a free online video resource. The series of videos introduce training techniques – for beginners and experienced sailors - in various wind strengths, demonstrating how to master the techniques in different wind and sea conditions and what to consider when undertaking manoeuvres. Available in English, French, German, Spanish and Japanese, the videos have attracted in excess of 200,000 views – clear evidence of the worldwide appetite for online training.



420 EXERCISE BOOK - The next step in our training resources is the launch of the 420 Exercise Book, which is specifically targeted at coaching techniques with structure, direction and purposes. The International 420 Class Association recognizes the valuable role coaches play in sailors' development and want to provide equal opportunity to coaches around the world to access training. The Exercise Book provides step by step instructions, clear explanation of the purpose of the training technique, details of equipment required, video, commentary and guidance on how to evaluate performance for sailors of all abilities.

The International 420 Class Association has partnered with Nikos Drougkas to produce both “420 TO THE MAX” and the “420 E-BOOK”. My thanks to Nikos for his commitment to the project and vision in helping the 420 Class to develop our training resources.

I would also like to thank the 420 Class Vice-President Joaquim Malhao, who is responsible for the project, former Vice-President Jose Massapina who initiated the project and all members of the 420 Executive Committee for their support; Jurgen Cluytmans, Dimitris Dimou and Catherine Dodds.

On behalf of the International 420 Class Association, enjoy the 420 E-Book. We welcome your feedback to office@420sailing.org

Nino Shmueli
President, International 420 Class Association



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Born on November 9th 1975.

Has sailed Optimist, 420, 470, J24, Mumm 36, Farr 40 and ILC 40.

Coaching since 1997 in Optimist and Team Racing, 420 and 470 classes during which time his athletes have won several titles in World and European Championships.

He is a member of and acting general secretary of the Greek Coaches Union.

He is a certified National Measurer in Dinghy Classes since 2003.

The International 420 Class has selected Nikos to organize and perform several development events around the world, including their cooperation in the development of the educational DVD **"420 TO THE MAX"**.





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Debriefing




nautivela


Performance and Passion since 1961



International 420 Class Exercise Book




5



combined: 2
similar: 12,14,18,25,26,28

Boat Handling

1 BASIC TACK



Level 1 - Basic

How to tack

L-60 min M-50 min

A – THEORY



Helm:

1. Say "Tacking"
2. Start pointing slowly
- 3b. Pointing on maximum
4. Cross to the other side
- 5a. Sit down while you change hands
- 5b. Trim in the main sail
5. Look at the top batten to see if the leech has the proper tension

Crew:

2. Unhook
- 3a. Get in the boat
- 3b. Uncleat the jib
4. Cross to the other side while picking up the new jib sheet *
- 5a. Trim in and
- 5b. Get on the trapeze
6. Look at the jib to see if it needs additional tuning

*There two main different techniques for Tacking

- a) cross at once (most popular)
- b) tempo tacking



B – ACTION



- One rib (for 5-7 persons)
- One 420 dinghy
- A video camera



1. How to teach the crew the movements
2. Coordination between helm and crew



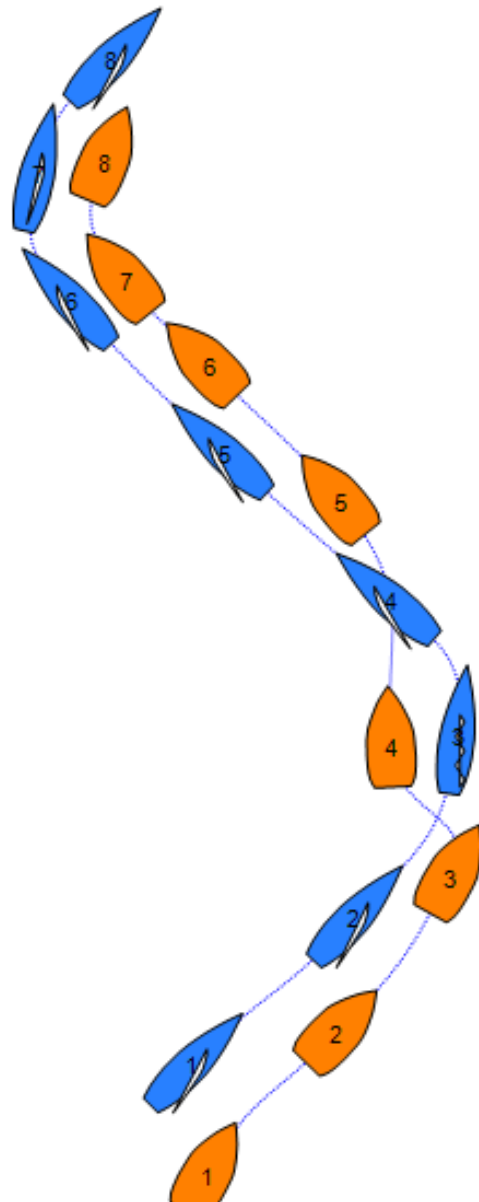
- On the water, we follow the boat and we whistle to them to tack, each time.
- In the beginning we ask them to execute the manoeuvres in slow motion. We tell them to focus and follow the steps, one by one.
- After approximately 20 tacks, we replace the team with another one. We use only one boat on the first day, making sure that they learn the exercise in a proper correct way. When the sailors are ready, we push them to execute the tack much faster. We need to stop them several times and correct their mistakes.



Make several videos. After the third day, mix the crews to make sure that everybody has the same level of technique.



- Mention to helm and crew their good moments and point out to them which ones they have to improve
- Ask them to keep notes from the training





International 420 Class Exercise Book



combined: 1
similar: 13,15,16,24,27,29,35

How to gybe

L-45 min M-35 min

Boat Handling



GYBE IN

MEDIUM

CONDITIONS

Level 1 - Basic

A – THEORY



There are two different styles of gybe

- Tiller between the legs or
- Hold the tiller extension

Gybe 1 – LIGHT

Helm:

1. Say "Gybe" and uncleat the jib sheet
2. Grab the leeward spinnaker sheet and start bearing away slowly
3. Stand up and place the tiller between your legs
4. Grab the windward spinnaker sheet
5. Roll the boat to gybe
9. Sit down by passing the leeward spinnaker sheet to the crew

Crew:

2. Uncleat the windward spinnaker sheet
3. Trim the guy
5. Roll the boat to gybe by pulling the main sail using the boomvang
6. Pump the main sail gently
7. Set the spinnaker pole to the windward side
8. Cleat the guy
9. Sit down and get the leeward spinnaker sheet



Gybe 2 - MEDIUM

Helm:

1. Say "Gybe" and uncleat the jib
2. Grab the windward spinnaker sheet
3. Stand up with the tiller extension in your hand
4. Bear away to gybe
5. Grab the leeward spinnaker sheet

- 7a. Sit down by passing the leeward spinnaker sheet to the crew

Crew:

2. Uncleat the windward spinnaker sheet
3. Balance the boat
5. Gybe by pulling the main sail using the boomvang
6. Set the spinnaker pole to the windward side

- 7a. Cleat the guy
- 7b. Sit down and get the leeward spinnaker sheet

B – ACTION



- One rib for 5-7 persons
- One 420 dinghy
- A video camera



1. Helm and crew movements
2. Control of the tiller during the gybe



1. If, several times, the helm forgets to follow the steps one by one or misses one, stop the manoeuvre and ask the team to repeat the gybe from the beginning.
2. Write down, on masking tape, all the necessary steps with bullet points and stick it in a place on the boat so the helm can see it (suggestion: on a side tank).
3. The helm normally has difficulty in keeping the spinnaker full (see exercise 7 – Keep the Kite Full).
4. The crew needs to balance the boat most of the time.



For the first day use only one boat for all teams



Ask them to write in their notebooks all the procedures of the gybe, and help them to understand their mistakes.



International 420 Class Exercise Book



combined: 36

How to set up the boat



Boat Handling

 **BOAT SETUP**

Level 1 - Basic





International 420 Class Exercise Book



Recovering a capsized boat



Boat Handling

GET THE
BOAT
UPRIGHT

Level 1 - Basic





International 420 Class Exercise Book



combined: before
all exercises
similar: 5, 21

Warm up your body

L-10 min

M-8 min



Warm Up
**TACKING
AND
GYBING**

Level 1 - Basic

A – THEORY



Draw the exercise on the whiteboard and explain to the team that this is not just an exercise for warm up but it also helps both helm and crew to improve the synchronization between their movements while tacking and gybing.

B – ACTION



- One rib
- Two marks with anchors



How to round close to the mark



Course: Set the 2 marks at a distance of 30 metres, up to 4 boat lengths.

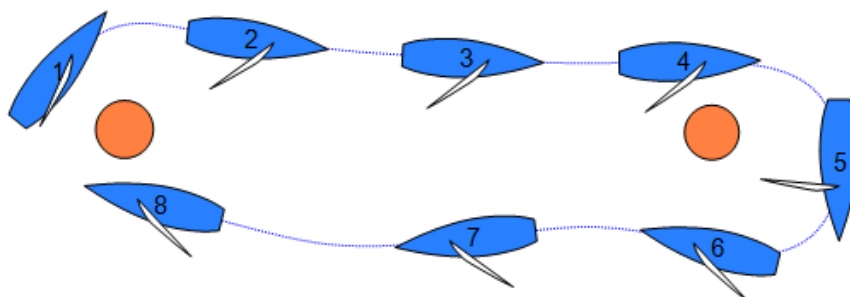
Rule: While you start bearing away for the mark rounding, make sure that you are not on a collision course with other boats and avoid any other boat even if you have right of way (good to hail).



If it is too windy and the skills of the teams are not that good, increase the distance between the marks to avoid any damage.



- The higher the level of boat handling of the team, the closer you set the marks to make the exercise more difficult.
- Reverse the way the boats round the mark so teams practice on both tacks and gybes (port to starboard and starboard to port).





International 420 Class Exercise Book



combined: 12, 14, 18
similar: 22

How to line up the team
fast and easy



Warm Up

**RABBIT
START**

Level 1 - Basic

A – THEORY



Line up the teams using the “Rabbit Start” for either :

1. Tack or
2. Sail upwind

The faster the teams line up, the more time effective is the training.



Draw the exercise on the whiteboard and explain the distance the teams have to keep before sailing behind the “Rabbit” boat.

B – ACTION



- One rib
- Three or more 420 dinghies



For the “Rabbit” (leader) boat understanding when to start and for the rest of the team how to coordinate with the “Rabbit” boat.



Ask one boat to be the “Rabbit”. While all the boats are on the same tack, the “Rabbit” starts bearing off to reach away from the rest of the boats for a distance of approximately 50-70 metres. Then she tacks and sails upwind. In the meantime, the rest of the teams start reaching towards the “Rabbit” by keeping between them at least one and a half boat lengths distance. When they approach the “Rabbit”, they must pass astern and sail upwind. Two boat lengths after the last boat passing, the “Rabbit” must tack.



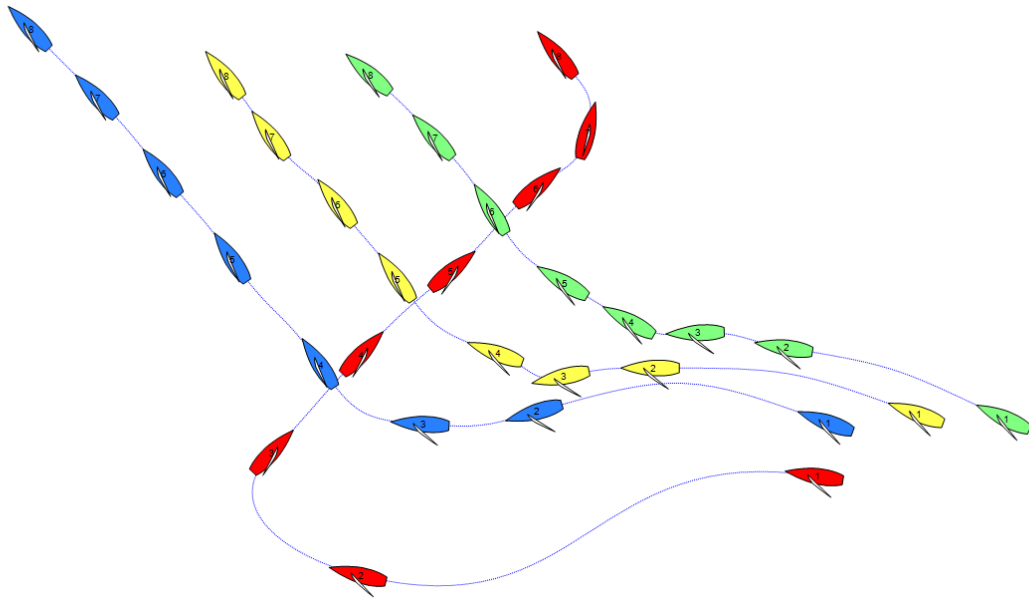
1. The Rabbit must start when all boats are ready to sail
2. Distance between the boats



On the first day of practicing the rabbit start, be patient!




Show them several videos of the day with good examples of the Rabbit Start Exercise.






International 420 Class Exercise Book




5



similar: 2


Valuable Exercise



**KEEP
THE
KITE FULL**

Level 1 - Basic

Improve the control
of the spinnaker during gybe



M-25 min

A – THEORY



B – ACTION



- One rib
- One 420 dinghy for each team
- A video camera

Teaching the helm how to keep the spinnaker full and the crew how to set the pole is the main difficulty of this exercise.

- Ask the helm to stand up and gybe without sitting down. The helm should hold both of the spinnaker sheets in his hands all the time.
- The only thing the crew has to do is to change the spinnaker pole after each gybe. The helm has to bear away slowly and trim the windward spinnaker sheet by releasing the leeward sheet. He should repeat this movement a couple of times until the boat is totally dead downwind. Then, the helm gybes and the crew has to change the pole by pushing it forward smoothly but fast (and not vertical to the side).



- Position yourself, follow the boat from the back and try to be in one line with the windward spinnaker leech and the helm so you can see what he can see.
- Ask him to gybe slowly. It is important to remind him of all the steps and of steering the boat with his knees, keeping the tiller in control (or holding the tiller extension).
- Repeat several times to the helm that he must look at the windward leech of the spinnaker at all times.

1. Keep the spinnaker full at all times
2. Balance during the gybe

- This exercise can be executed by either holding the tiller extension in your hand or by keeping the tiller between your legs.
- If you have additional time for training ask the crew to hold both of the spinnaker sheets while gybing.
- Apply the same exercise techniques without the use of spinnaker pole.

Mention to the sailors the moves that were improved during the exercise and which details they must focus on for future gybes.



International 420 Class Exercise Book

Boat Handling Mark

ON TOP MARK

combined: 9
similar: 10, 32

Improve mark rounding
from upwind to downwind

M-100 min

Level 1 - Basic

A – THEORY



Analyse step by step the mark rounding.
There are several ways and techniques for this manoeuvre.

Helm:

Crew:

Before Mark

3 boat lengths

1. Raise the spinnaker behind the jib

2 boat lengths

2. Ease the boomvang

1 boat length

On the Mark

3. Bear away

4. Stand up

5. Hoist the spinnaker

- 6a. Grab the spinnaker sheets

- 6b. Flying the spinnaker full

- 7a. Sit down (first)

- 7b. Pass the spinnaker

3. Unhook

4. Ease the jib and balance the boat while you move in

5. Set the pole

- 6b. Cleat the windward spinnaker sheet

- 7b. Sit down (after helm) and grab the spinnaker sheet



8. Raise centreboard
9. Trim the jib
10. Look up at your leech

B – ACTION



- One rib
- Two or three marks
- One 420 dinghy for all teams



- Ask teams to execute the mark rounding very slowly step by step. It will be very helpful if you remind them of all the steps of the exercise at the beginning. After a couple of mark roundings, let them perform the exercise alone and afterwards let them know if they forgot something.
- Set a short course so the teams have enough time to hoist the spinnaker, do a gybe and a leeward mark rounding.



Beginners' main problems are:

1. Before mark rounding:
Helm: to ease the boomvang
Crew: to unhook at the right moment

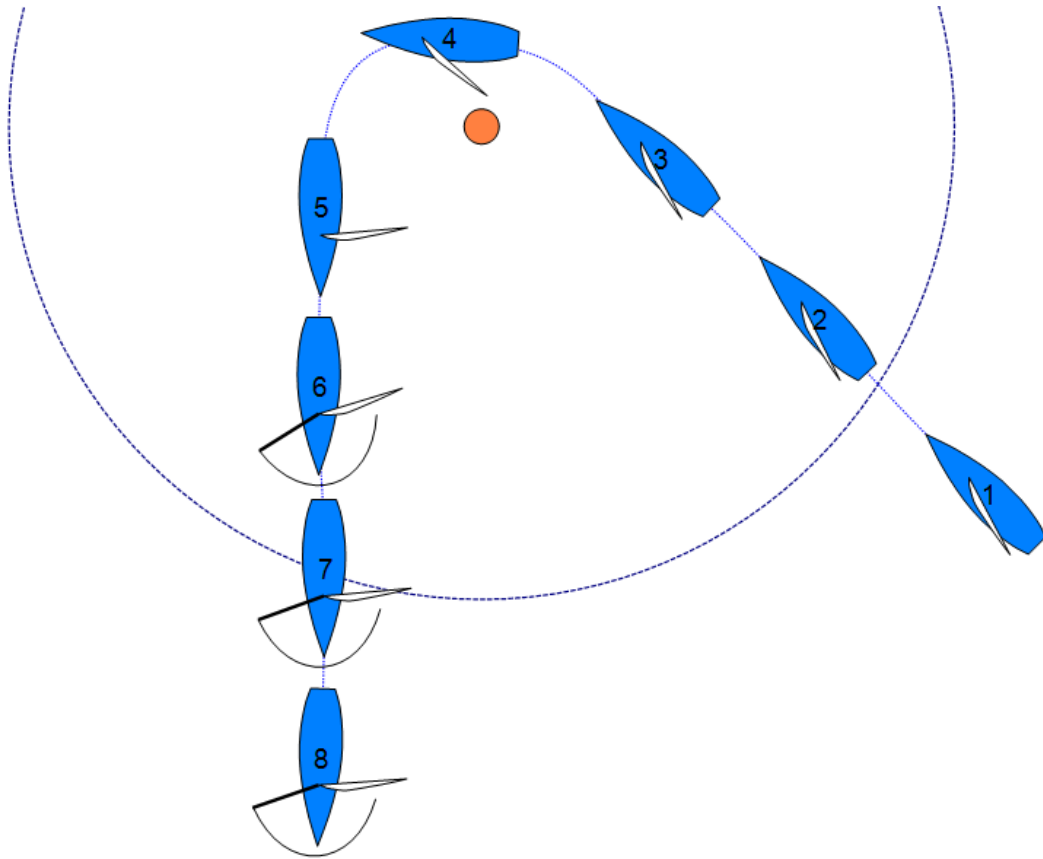
1. After the mark:
Helm: steer the boat in conjunction to the angle of the wind
Crew: slow to set the pole



- As they execute the manoeuvre correctly, ask the helm to try to steer the boat faster by getting the maximum pressure from the main sail and spinnaker.
- Use only one boat on the first day, so you'll be sure that everyone gets the proper education!
- After you complete a full round with all sailors having been in the boat, upgrade the exercise by shortening the course or set an additional leeward mark in between.




- First mention the good moves and advise them how to improve the wrong ones.
- Ask them to write down their mistakes and set the goals for the next one.








International 420 Class Exercise Book



combined: 8

Improve mark rounding
from downwind to upwind

L-100 min M-100 min



Boat Handling
Mark

AT
LEEWARD
MARK

Level 2 - Racing

A – THEORY



Helm:

2. Centreboard down (can be the first movement or the last thing before the mark rounding)
- 3a. Grab the spinnaker sheet and stand up (by holding the tiller extension or placing it between his legs)
- 3c. Grab the windward spinnaker sheet and take the slack
- 5a. Pull the windward spinnaker sheet
- 5c. Drop both of the spinnaker sheets
Release the spinnaker halyard

Crew:

1. Calculate the time and distance to the mark and call for the “drop” of the spinnaker
- 3b. Uncleat the windward spinnaker sheet, hand it over to the helm – stand up
4. Stand up and remove the spinnaker pole
- 5b. Start collecting the spinnaker
6. Drop the spinnaker and place it in the bag



Next to the mark

7. Trim in the main sail

7. Trim the jib

B – ACTION



- One rib
- Two or three marks
- Two 420 dinghies, one for each team



1. Calculating time and distance to the mark
2. Synchronization between helm and crew



Follow the sailors and remind them any step or move that they might forget.



1. Rounding the mark as closely as possible
2. Keeping the boat balanced around the mark (see exercise 21 – Boat Balance around the Mark)
3. Keeping the spinnaker full without the spinnaker pole (exercise 7 – Keep the Kite Full)



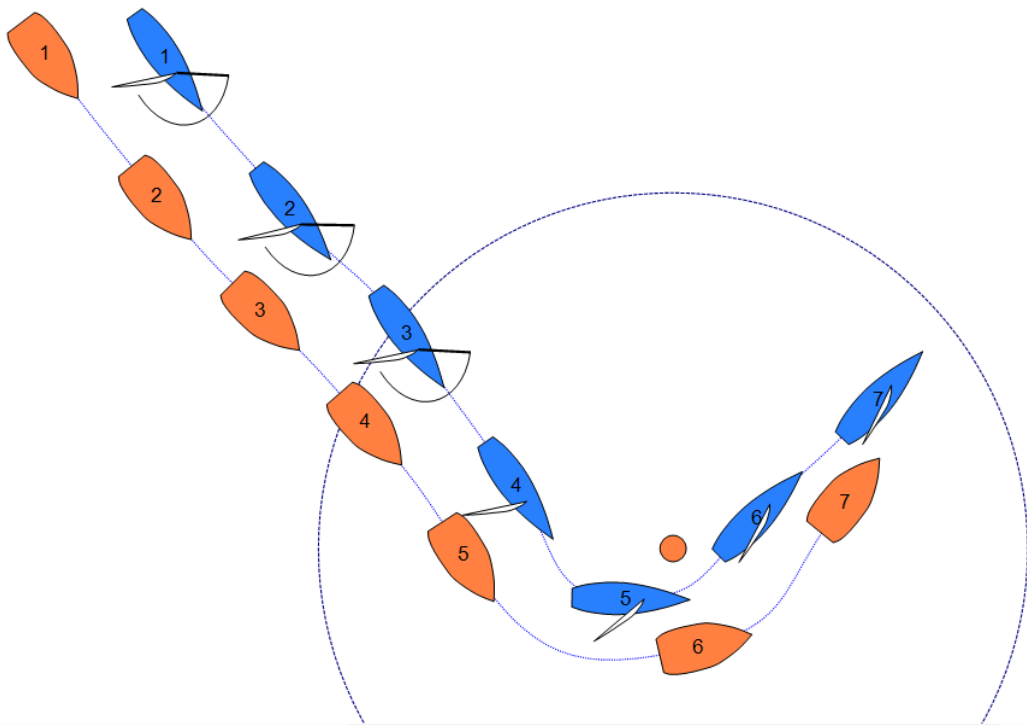
In the beginning of the exercise:

- Always stay next to the team and remind them of any step that they may forget
- Ask them to execute the exercise slowly and start the procedure to drop the spinnaker way earlier BUT FOLLOWING THE STEPS ONE BY ONE

As the time passes ask them to drop the spinnaker closer to the mark. If they drop it earlier, start loudly counting the seconds after they dropped it, up to the mark, (and 1, and 2, and 3 ...)




Several notes and videos will be needed for detailed discussion at the debriefing.






International 420 Class Exercise Book



combined: 9
similar: 8, 32

Improve mark rounding
from upwind to downwind

L-100 min





combined: 9
similar: 8, 32

**Boat Handling
Mark**

**MARK ROUNDING
IN LIGHT
CONDITIONS**

Level 2 - Racing

A – THEORY



Helm:
Before the mark

2. Two **boat lengths** raise the spinnaker 60cm
3. One **boat length** ease totally the slack of the boomvang

On the Mark

4. Bear away and ease the main sail
5. Hoist the spinnaker
- 6a. Grab the leeward spinnaker sheet
- 6b. Sit down
- 6d. Hand the spinnaker sheet to the crew
7. Raise the centreboard
8. Trim the jib
9. Look up on your leech

Crew:

1. At three **boat lengths** start setting the spinnaker pole

4. Ease the jib
5. Pull the windward spinnaker sheet and cleat it

- 6c. Sit down
- 6d. Get the leeward spinnaker

B – ACTION



- One rib
- Two marks
- Two 420 dinghies, one for each team



1. Make the team coordinate their movements in a gentle way
2. Raise the spinnaker fast and fly it full



- Advise them to move in the boat gently otherwise they affect a lot the wind flow on the sails
- The coach should stay close to them, making sure they follow the steps in the proper order



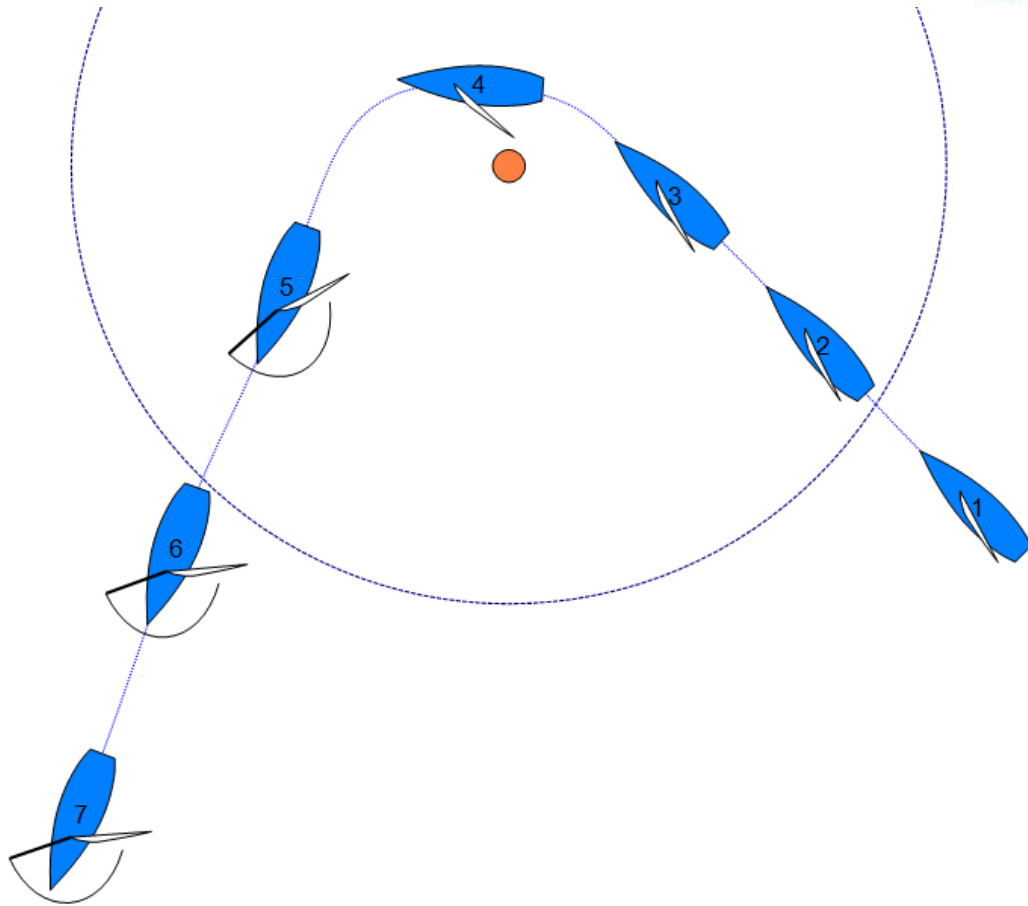
The main problem is the inclination, which affects the boat speed.



- Make several videos
- Ask them to stand up to hoist the spinnaker fast




Show the video and mention what they should focus on more next time.






International 420 Class Exercise Book




7



combined: rolling gybes
similar: 12, 14, 18, 25, 26, 28

**Boat Handling
Manoeuvre**

ROLLING TACK



11

Level 2 - Racing

Perform a rolling tack

L-40 min

A – THEORY



Helm:

1. Say "Tacking"
2. Start pointing slowly

- 3a. Roll the boat on windward
- 3b. Pointing on maximum
4. Cross to the other side

5a. Balance the boat

5b. Trim in the main sail

6. Look at the top batten to see if the leech has the proper tension

Crew:

2. Stand up
3. Roll the boat on windward

4a. Sit on new leeward side

4b. Trim in the jib

6. Look up at the jib leech to see if needs any adjustments

B – ACTION



- One rib (for 5-7 persons)
- One 420 dinghy
- A video camera



Coordination between helm and crew for rolling the boat.



- On the water, we follow the boat and we whistle to them to tack, each time.
- In the beginning we ask them to execute the manoeuvres in slow motion. We tell them to focus and follow the steps, one by one.
- After several tacks, replace the team with another one. When the sailors improve their synchronization, we ask them to execute the tack at the correct speed.



Difficulty of the crew to roll on the proper moment.

Ask the crew to:

1. Follow the rolling movements of helm
2. Support his body while rolling to tack with the foot under the centreboard case



Use only one boat on the first day, making sure that they learn the exercise in a proper way.



- Mention to helm and crew, their good moments and point out to them which ones they have to improve
- Ask them to keep notes from the training



International 420 Class Exercise Book

6

combined: 15
similar: 1, 14, 18, 25, 26, 28

12

Boat Handling Manoeuvre

TEAM TACK

How to tack under pressure

L-60 min M-50 min

Level 2 - Racing

A – THEORY



- Write down all the steps needed for a tack
- Remind each team of the mistakes they made during the tack procedure
- Ask them to execute the “Rabbit start”, which makes line up easier before the team tack
- Mention to them several times before they tack that they need to look to their windward side to see if there is room to tack

B – ACTION



- One rib
- One 420 dinghy per team
- An assistant to film the exercise



There are no particular difficulties with this exercise other than to avoid any collisions between boats.



- Hundreds of tacks will be needed to master the manoeuvres properly in each wind condition and a couple of days to memorize the tack through reflex.
- It is very important to ask the helm to tack slowly in the first manoeuvres.
- Remind the sailors that they must check for boats to windward each time before they tack.
- **For team training:** After 8-15 tacks you may need to stop the exercise and line them up again to continue.

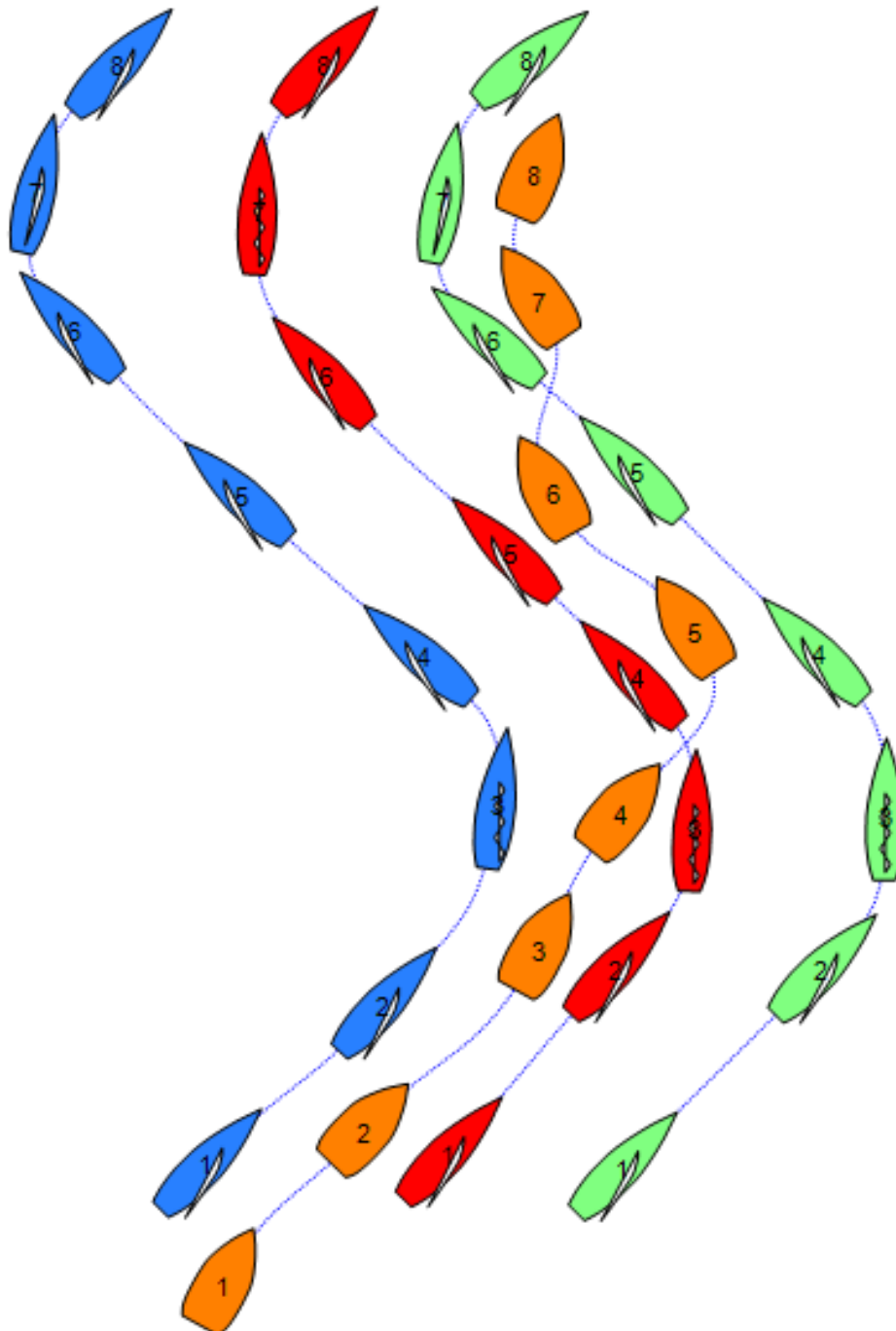


1. Bad performance in tacking, from one team (or more), might delay the progress of the rest. At that point, you should consider separating those teams from the rest of the group and start helping them to improve before joining them with everyone again.
2. The rest of the team should keep tacking “in auto” (after



completing a tack wait for 30 seconds and tack again).

Mention to the sailors the moves that need improvement during the “TEAM TACK” and on which details they must focus.





International 420 Class Exercise Book



combined: rolling tacks
similar: 2, 15, 16, 24, 27, 29, 35

Perform the gybe

L-40 min M-30 min

Boat Handling
Manoeuvre

13

GYBE IN
LIGHT
CONDITIONS

Level 2 - Racing

A – THEORY



There are two different styles of gybes

1. Tiller between the legs or
2. Hold the tiller extension

Gybe 1 – LIGHT conditions, Tiller between the legs

Helm:

1. Say "Gybe"
2. Grab the leeward spinnaker sheet and start bearing away slowly
3. Stand up and place the tiller between your legs, keep bear away until you gybe
4. Grab the windward spinnaker sheet
5. Roll the boat and the spinnaker to gybe
6. Keep the spinnaker full at all times

Crew:

3. Uncleat the windward spinnaker sheet
4. Trim the guy
5. Roll the boat to gybe by pulling the main sail from the boomvang
6. Pump the main sail gently on the new tack
7. Set the spinnaker pole to the windward side
8. Cleat the guy



8.1 Drop the guy

9. Sit down by passing the leeward spinnaker sheet to the crew

9. Sit down and get the leeward spinnaker sheet

Gybe 2 –MEDIUM conditions

Hold the Tiller extension

Helm:

1. Say "Gybe"
2. Grab the windward spinnaker sheet
3. Stand up
4. Bear away to gybe
- 4.a. Grab the leeward spinnaker sheet
5. Roll the boat and the spinnaker to gybe
6. Keep the spinnaker full at all times

Crew:

3. Uncleat the windward spinnaker sheet
4. Extend your hand to pass the spinnaker sheet to the helm
5. Roll the boat and pull the main sail from the boomvang
6. Pump the main sail gently on the new tack
7. Set the spinnaker pole to the windward side
8. Cleat the guy
9. Sit down and get the leeward spinnaker sheet

8a. Drop the guy

9. Sit down by passing the leeward spinnaker sheet to the crew

B – ACTION



- One rib for 5-7 persons
- One 420 dinghy



- Helm and Crew Movements
- Control of the tiller during the gybe



Onshore: Demonstrate to the crew how to set the spinnaker pole.

On the water:

- Ask them to gybe slowly
 - Insist the helm looks at the spinnaker at all times
- Rotating the teams you give them the opportunity to understand their mistakes, by watching the others



1. Several times the helm forgets to follow the steps one by one or misses one. Stop the manoeuvre and ask the team to repeat the gybe from the beginning.
2. Write down, on masking tape, all the necessary steps with bullets and stick it in a place so the helm can see it (suggestion: on a side tank).
3. The helms normally has difficulty in keeping the spinnaker full



- (see exercise 7 - Keep the Kite Full).
4. The crew has difficulties in setting the spinnaker pole correctly.
- For the first day use only one boat for all teams
 - Mix members from different teams, if you think they might perform better gybes. In that way, you can achieve better gybe demonstration and consequently team spirit is improved

Ask them to write in their notebooks all the procedures of the gybe, and help them to understand their mistakes.



International 420 Class Exercise Book



combined: 15
similar: 1, 12, 18, 25, 26, 28

Perform tack under pressure



L-65 min M-50 min



Boat Handling
Manoeuvre

14

GYBE IN

LIGHT

CONDITIONS

Level 2 - Racing

A – THEORY



Line up the teams and after approximately 30 seconds, ask them to start tacking like a “domino” from the windward boat to the leeward. When the last boat completes the tack (now it is the windward one), tack again after 30 seconds and so on. Ask them to line up again after 15 tacks.

B – ACTION



One 420 dinghy for each team



Line them up and ask them to tack one by one. Each boat has to wait for the previous boat to complete the tack and then start tacking. This exercise gives the coach the opportunity to observe each tack performed by all the teams, so he can take notes and video the details that all teams must improve.



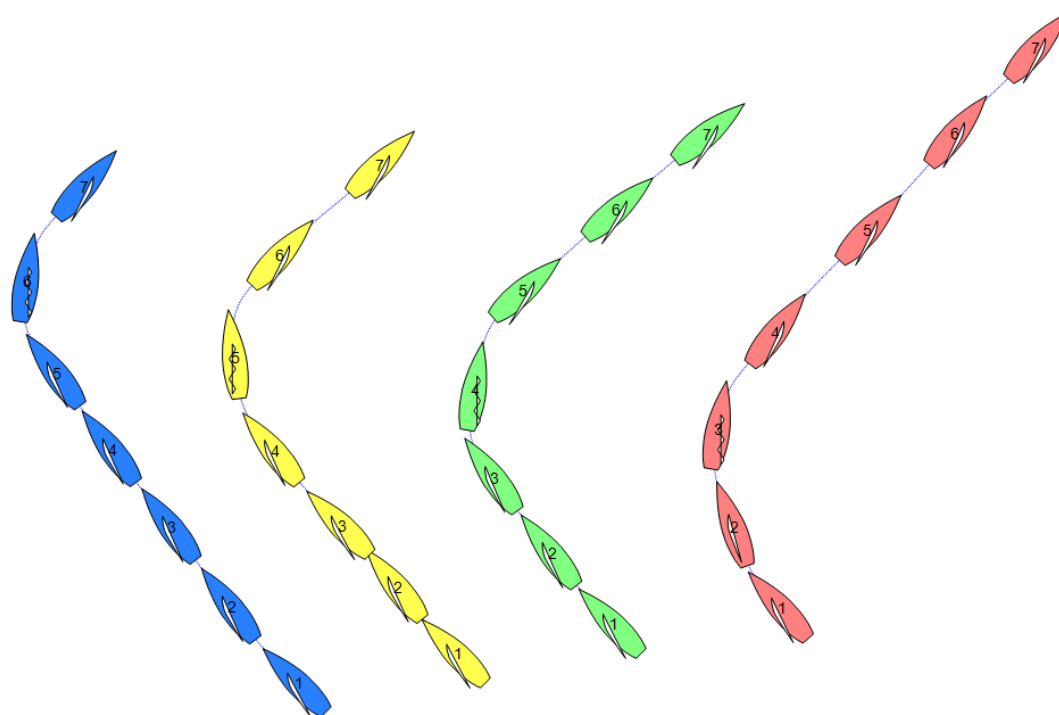
Make sure that you keep a safe distance between the boats and your rib, so you can easily take your notes.



Make several videos. If there is a crew that forgot a specific movement, write it on masking tape and stick it on the side tanks or on the boom.



- Mention the good things that happened during training and the mistakes that teams need to improve.
- Ask the crew to take notes.





International 420 Class Exercise Book

6

combined: 14
similar: 2, 13, 16, 24, 27, 29, 35

15

Perform the gybe

L-50 min M-40 min

**Boat Handling
Manoeuvre**

**DOMINO
GYBE**

Level 2 - Racing

A – THEORY



Draw on the whiteboard the distance they must keep between the boats and the procedure they must follow so you can follow all of them while gybing and correct their mistakes.

B – ACTION



- One rib
- One 420 dinghy for each team
- A video camera



1. Synchronize helm and crew
2. Keep the spinnaker flying (during the gybe)



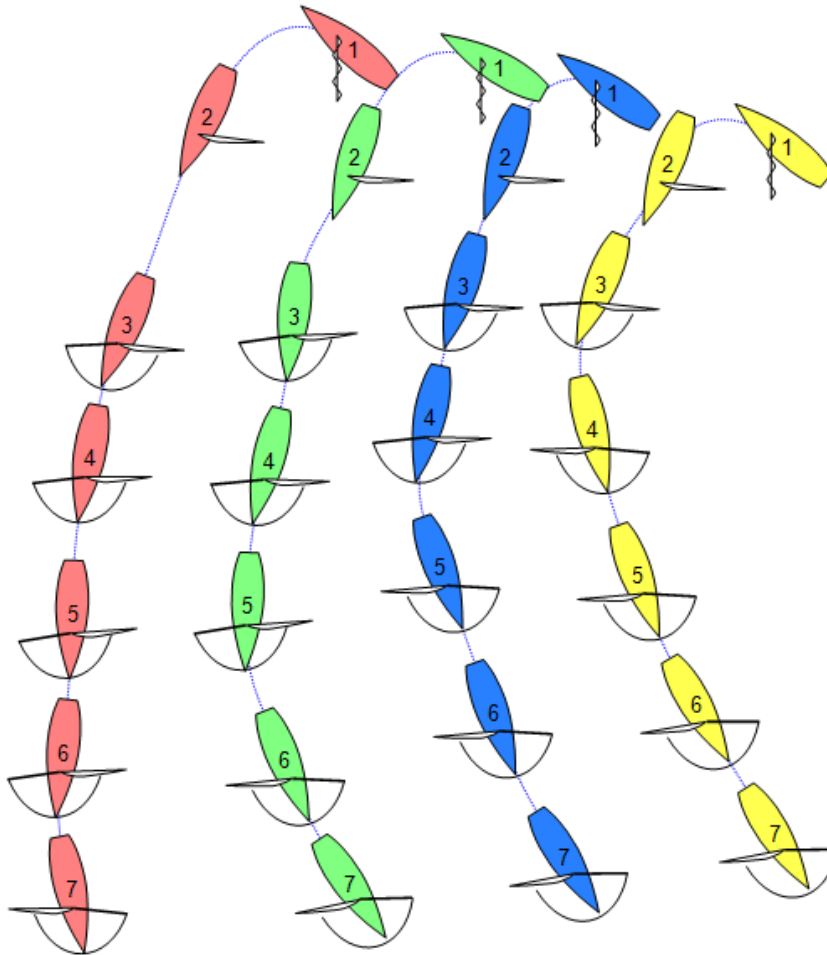
- Line up the boats downwind. Afterwards ask them to start the Domino Gybes.
- The leeward boat gybes. After her gybe, the boat which was to windward gybes too and so on. When the last boat completes her gybe, wait for 30-40 seconds and start the gybing sequence again.



- The coach is able to monitor all teams by following them from behind and observe each of them
- Keep track of the time which each team needs to complete the gybe



- Ask the sailors to point out the good and bad moments of the day
- Project several videos of each team to point out to them the things that they forgot





International 420 Class Exercise Book



combined: upwind tacks
similar: 2, 13, 15, 24, 27, 29, 35

Perform gybe in heavy wind



H-20 min



Boat Handling
Manoeuvre

16

GYBE IN
HEAVY WIND
CONDITIONS

Level 2 - Racing

A – THEORY



WHITEBOARD

Helm:

1. Say "Gybe"
2. Grab the leeward spinnaker sheet and start bearing away slowly
3. Stand up and place the tiller between your legs
4. Grab the windward spinnaker sheet
5. Bear away to gybe
8. Sit down by passing the leeward spinnaker sheet to the crew
9. Trim in the jib

Crew:

1. Uncleat the windward spinnaker sheet
3. Trim the guy
5. By pulling the main sail
6. Set the spinnaker pole to the windward side
7. Cleat the guy
8. Sit down and get the leeward spinnaker sheet

B – ACTION



- One rib
- One 420 dinghy



- Helm and Crew Movements coordination
- Control of the tiller during the gybe
- Balance after gybe

Onshore:

- Show the crew how the spinnaker pole is working
- How to keep the boat balanced (fore and aft)

On the water:

- Ask them to gybe with speed
- Insist that the helms looks at the spinnaker at all times
- Follow them from the back and windward as it is the only safe way to avoid any contact with the boat



Repeat it several times and change between teams. By rotating the teams, you give them the possibility to understand their mistakes, by watching the other teams.



Several times the helm forgets to follow the steps one by one or misses one. Abandon the manoeuvre and ask the team to repeat the gybe from the beginning.



For the first day, use only one boat for all teams.



Analyse several videos of the day, with gybes from all teams. Ask them to write in their notebooks all the procedures of the gybe, and help them to understand their mistakes. Point out to them the good steps and manoeuvres, as well.



International 420 Class Exercise Book

Tactic & Starts

17 INDIVIDUAL STARTS



Estimate the starting line

L-70 min M-60 min H-45 min



Level 2 - Racing

A – THEORY



- Normal
- Early
- Delay Start



The goal of this exercise is to have the sailor raise his hand the moment the bow crosses the starting line while sailing at maximum speed.

B – ACTION



- One mark
- One rib with anchor
- Several 420 dinghies



The main problem is to estimate the position of the line.



Set a 40 metre starting line between a mark and your rib.

- Blow once when the bow of the boat crosses the line
- If sailors perform the exercise correctly, congratulate them
- If they raise their hand early, calculate the distance or the time to help them estimate better the line



1. Blow two times if they are late to raise their hand
2. Additionally, there are two members of the team which means two different opinions on the position of the line
3. While they are approaching the line, ask them to look for both ends of the line




- Change the line to be favourite to the pin end and sometimes to the windward end
- After a break, the coach keeps track of which team can estimate the line better, thus making the exercise more interesting and keep all teams focused



During the debriefing, the coach should talk to the sailors about their mistakes and specifically their notion about boat position and angle at which they approach the starting line.



International 420 Class Exercise Book



combined: 2
similar: 1, 12, 14, 25, 26, 28

Improve your skills
to escape from difficult situations



L-30 min M-30 min H-22 min

Tactic & Starts

18

**DUCK
AND
TACK**

Level 2 - Racing

A – THEORY



During discussion, explain to the sailors how important it is to follow your strategy plan after a medium or a bad start:

- to sail in **clear air** after a medium or a bad start
- to follow **your primary** plan

When a boat is stuck to leeward and needs a way out, she needs to perform the duck and tack manoeuvre. If this is executed correctly, the team can gain several metres and improve their position in the fleet.



Helm:

Say "Tacking"

1. Bear away (to create distance)
2. Head up
- 3a. Tack

After tack

4. (Max speed) duck if necessary
5. Say "Tacking"

Crew:

2. Ease the jib
3. Trim in

4. Keep the boat flat (if duck ease the jib)



B – ACTION



- One rib
- At least two 420 teams



1. The difficulty is for the teams to realize how much room they need to tack and pass behind the other boats
2. High level coordination between helm and a crew is needed to bear away



- Line up the boats at a very close distance and stay at all times behind the boat that is about to tack
- Advise helm and crew to calculate the distance to tack
- After tacking, ask them immediately to bear away and keep the boat flat
- In the first stages of the exercise, it is better that the coach whistles before any team tacks, so he can control the teams that execute the manoeuvre correctly. Additionally, he can point out to them:
 - a) the ideal distance to tack, avoiding any damage
 - b) if the teams are trying to tack earlier or losing a lot of distance and
 - c) if the teams are bearing away more than is needed



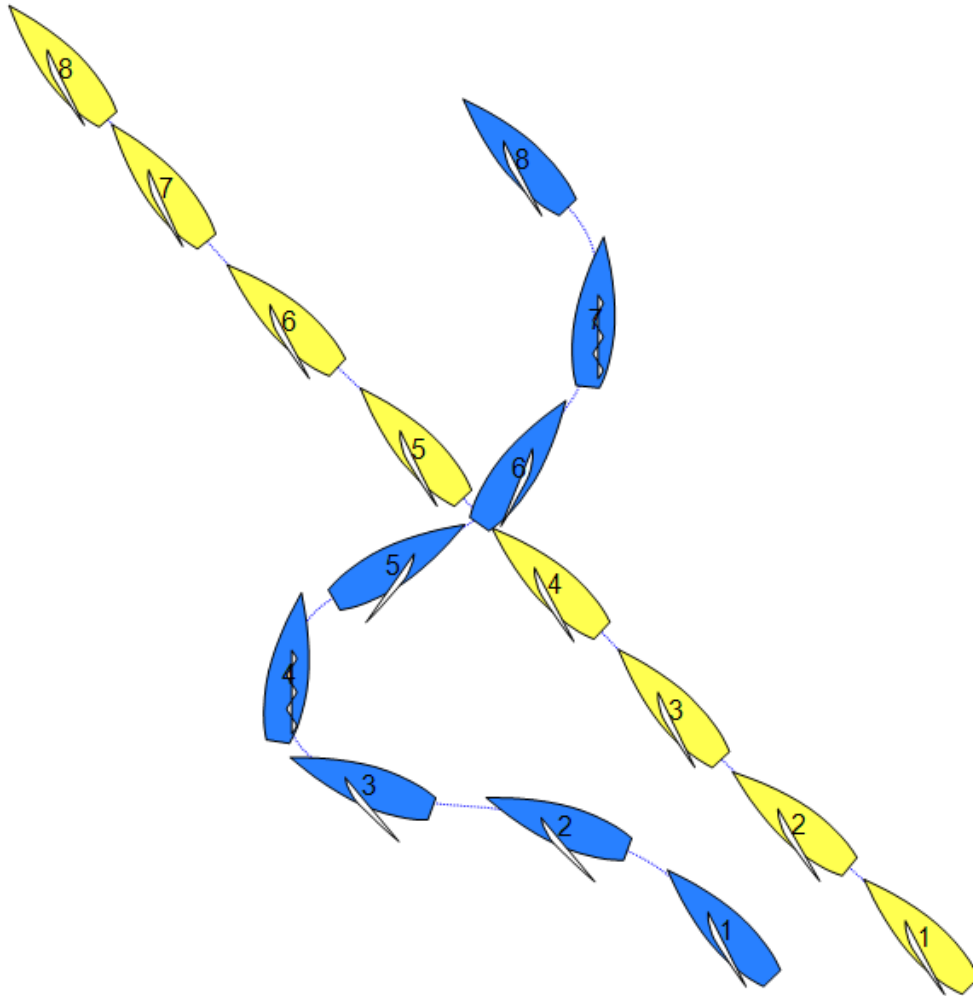
1. Sailors should avoid any damage!
2. An important issue is how the helm and crew will coordinate their moves, as the boat now accelerates more, before and after the tack, in medium and strong winds. Also, this is not a normal tack procedure, as the boat bears away before and after the tack
3. In light wind conditions, the exercise is much easier, but after the rolling tack, the boat should be dead-flat and avoid any contact between the masts
4. Several tacks will be needed for the sailors to start to feel comfortable with this challenging manoeuvre. As they become more confident about their boat-handling skills on tack and duck, they will perform better
5. Additionally, this exercise is useful for tactics near the top mark



- Repeat this exercise several times on starboard and just a few times on port tack
- Also it can be an advance warm up exercise for higher level sailors



Discuss with the sailors their performance and clarify the points that need improvement within this exercise





International 420 Class Exercise Book



Improve boat position
after a bad start

L-60 min M-60 min H-40 min



Tactic & Starts

THE
GREAT
ESCAPE

Level 2 - Racing

A – THEORY



- Draw the exercise on the board
- Set a course of 300 metres in light air or 400metres in medium

Rules:

- 2 minutes starting procedure
- 1 lap windward - leeward course
- Never cross the layline behind the rib boundary

Moreover, explain to them the rule “of obstruction” when it is applied and how we hail to the other boat (RRS 19 and definition of obstruction).

This exercise helps to:

- estimate better your options after a medium or a bad start
- improve the confidence and coordination between the crew

B – ACTION



- Two ribs
- Three marks with anchors
- Several 420 dinghies



1. How to escape from tight situations
2. Help to improve your tactics after the start and near the top mark
3. If there are any mistakes on boat handling (tack or coordination problems), they will also show up in this exercise
4. Steer the boat fast



- During the race, when someone breaks a rule give him a penalty. Give also a penalty to the leader boat(s) and position them back in the middle of the fleet
- Whistle and point with your hand to the teams that tend to cross the layline boundaries behind the rib



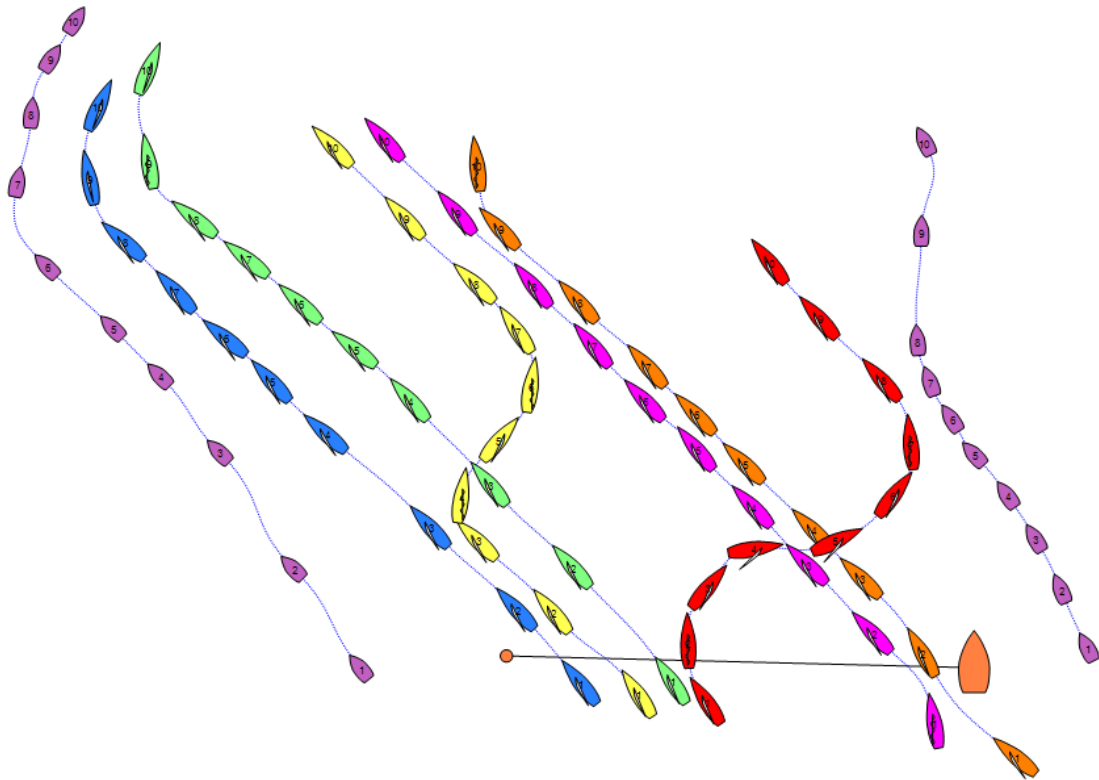
1. Mention several times that they should be very careful not to damage their boats and 'keep their eyes open'
2. Be perceptive to whistle in tight situations (possibly with a different whistle sound)
3. There is a high chance that in the beginning, the teams will not feel confident enough, so:
 - a. continue encouraging them
 - b. ask the helm to focus and execute the manoeuvre like a normal tack (not to be rushed during the tack)



- Do not try this exercise over 16 knots
- In the first couple of exercises do not create "tight" situations between the teams, by keeping the laylines far apart. As the time passes and the exercise progresses 'close the distance' between the ribs
- Make several videos and encourage them to keep trying for the best result
- Ask them to feel the boat balance




- Talk about the penalties and tactic mistakes
- Watch carefully on videos any possible mistakes during tacks and address matters for improvement







International 420 Class Exercise Book

Tactic & Starts








combined: 31
similar: 30



20 DEFENSE

Learn how to defend your starting position

L-60 min M-60 min H-30 min

Level 2 - Racing

A – THEORY



- A very good start gives us the possibility to follow our strategy plan and a good position at the finishing line if this plan is correct
- To sail clear and with maximum speed after the start, you need a certain distance from the boat to leeward and to be closer to the windward one

B – ACTION



- One rib
- Two marks with anchor lines (4 maximum)



1. How to attack
2. How to defend
3. Coordination of movements between crew and helm during manoeuvre
4. Calculating time and distance from the line



- Set a starting line of approximately 25 metres
- 3 minutes for the starting procedure
- Set the starting line so that the favourite side is the windward one
- The goal of the exercise is to start in maximum speed with as much possible distance from the boat on leeward and closest to your windward boat

In each start ask for a different team to approach the rest of the fleet on port tack at last 30 seconds before start, and attack the leeward boat.

- During the start, we stay at the back of the fleet, ordering the teams to attack or advising them on how to defend
- If needed, after the start, point out their mistakes by explaining what went wrong so they avoid them in the future



1. It is difficult, however crucial, for every boat that wants to have a great start, to pay attention to all boats around her in the starting line.
2. The sooner the crew sees the 'attacking' boat, the more time the team has to prepare the defending plan.



- Repeat the exercise and ask the 'attacking' boat to get in the spot that she wishes, if there is a space.
- If it's difficult for the teams to get their position in the start or they approach it too late, set another two marks to leeward of the line and limit them between the 4 marks.



Discuss with the sailors the importance of team work during the start, like time, distance, attack, defence, tactic, strategy, speed and manoeuvres.



International 420 Class Exercise Book



How to use your body weight
to steer the boat
during mark rounding

L-60 min M-60 min



Warm up

21 BOAT BALANCE
AROUND
THE MARK

Level 2 - Racing

A – THEORY



'Light Wind'

Set an upwind mark at a very close distance. Set your coach boat as the leeward mark. The sailors must sail around without spinnaker. The goal of this exercise is to only focus on the boat balance. While the boats sail around, the coach can move the rib in whatever direction he/she desires, either on one of the sides, or shorten and extend the distance.

Helm :

1. Upwind heeling the boat on leeward

Crew:

1. Upwind heeling the boat on leeward

Normal

On mark

2. Slowly bear away, stand up by heeling the boat slightly on windward and ease the main sail
3. Keep the boat heeling on leeward
4. Gybe by bearing away and heeling the boat on windward
5. **On rib (mark) to upwind**
6. Stand up heel the boat more to leeward
7. Head up trim in the main sail

On mark

2. Ease the jib by heeling the boat on windward
5. Roll the boat to gybe and stand up
6. Trim in the jib gently



Gybe on top mark

On mark (and Gybe)

1. Slowly bear away by heeling the boat on windward and ease the main sail.
2. Keep bear away and roll the boat to gybe

On rib (mark) to upwind

3. Stand up heel the boat to leeward
4. Head up trim in the main sail by sitting down on windward tank

On mark (and Gybe)

1. Ease the jib by heeling the boat on windward.
2. Roll the boat to gybe and stand up

On rib (mark) to upwind

4. Trim in the jib gently

B – ACTION



- At least one 420 dinghy
- One rib
- A mark with anchor



1. How to keep the boat balanced.
2. Movements, trimming and coordination between helm and crew.



- In the beginning, remind them all the procedures while they are rounding the top mark or your rib
- Ask them to move smoothly within the boat, so the boat does not 'feel' their movements
- Make clear to them that the most important thing is the boat balance
- On upwind, heel the boat slightly on leeward
- On downwind if the wind is too light, heel the boat more on the leeward



1. The sharp movements of the crew members destroying the air flow on the sails and slowing down the boat.
2. Ask them several times to start flattening the boat gently during the mark rounding to upwind.
3. Rounding the leeward mark by using only the rudder is a mistake. Also, it would be helpful if the sailors use their body weight to help the boat head up. The boat track should indicate a 'U turn'.



You can change the rule 18...

- the zone is at one boat length and
- if one boat touches the buoy there is a penalty of 360 degrees. If the team does not make the one turn penalty immediately, then the penalty becomes two turns.



- Discuss with the crew how they feel about the exercise and what improvement they see in themselves after executing it a lot of times.
- Marks on the sheets and on the boat for fast trimming are very important!



International 420 Class Exercise Book



Effective training



'Tool' Exercises

22

LINE UP

THE BOATS

FOR DOWNWIND

Level 2 - Racing

A – THEORY



This exercise is very useful for inexperienced young coaches or if several new teams join the group, in saving time and making training more effective.



Draw on the board the way that the teams should line up and remind them of the distance that they should keep between them before they bear off.

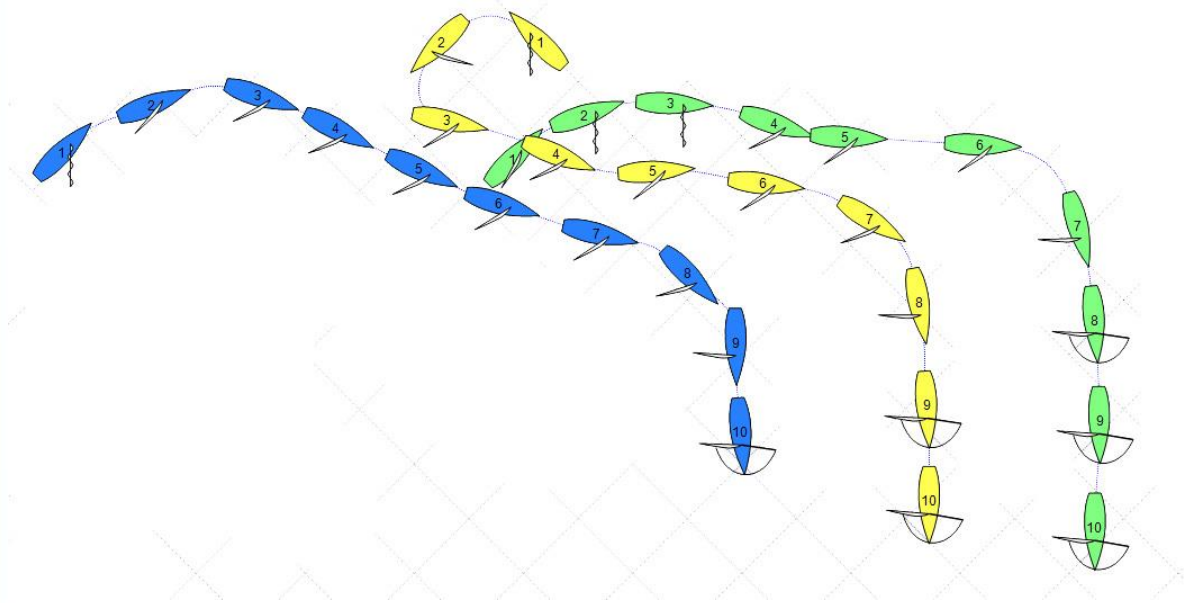
B – ACTION

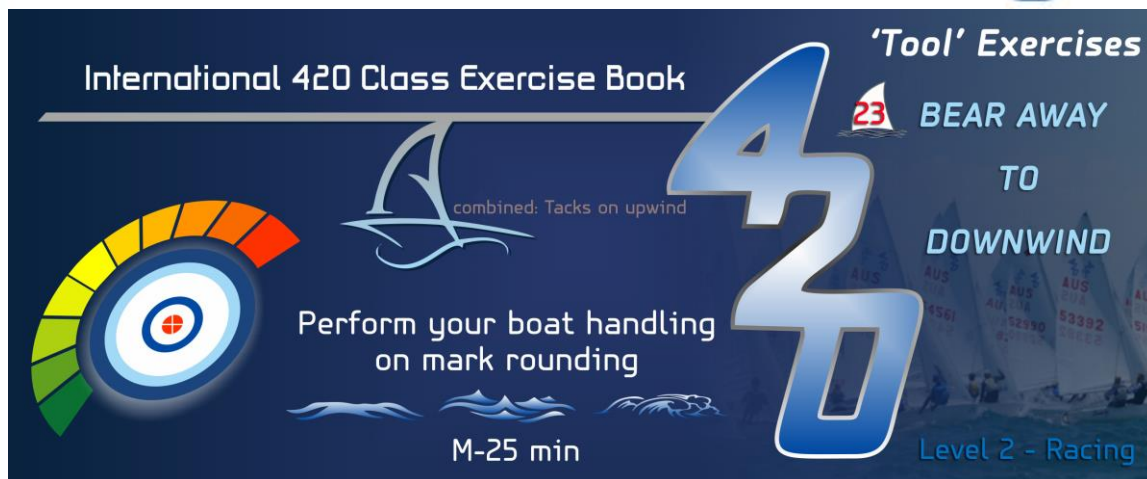


- One rib
- One 420 dinghy for each team



- Ask one team to be the leader and the rest to follow them by keeping between them two boat lengths difference. When they all line up and have a SIMILAR exercise speed, signal to them to set the spinnaker to downwind or reaching.
- Keep 2 boat lengths distance between the boats.





A – THEORY

Project video on a screen

The goal of this exercise is to teach the sailors how to round the second mark (from reach to downwind).



Reach to Downwind

Helm:

1. Bearing off
2. Bear away and stand up slowly and ease the main sail
- 2a. Sit on leeward
3. Raise the centreboard
4. Ease the jib sheet
5. Ease the boomvang if needed

Crew:

2. Unhook, get in the boat gently and ease the spinnaker sheet
- 2b. Trim the guy
3. Look at your spinnaker
5. Check pole height

Downwind to Reach

Helm:

1. Heading up
2. Head up and trim in the main sail
- 3a. Trim in the jib
4. Lower the centreboard
5. Trim in the boomvang/kicker

Crew:

2. Ease the guy
3. Get on trapeze and trim in the spinnaker sheet
5. Check your spinnaker pole height

B – ACTION



- One rib
- One 420 dinghy for each team
- A video camera



Coordination of movements between crew and helm.



- In the water, ask the sailors to reach, whistle to bear away to downwind by following the steps and the correct manoeuvres
- Remind them the things they forgot
- Ask the helm to bear way 'slowly' and gently
- Whistle one more time to reach again



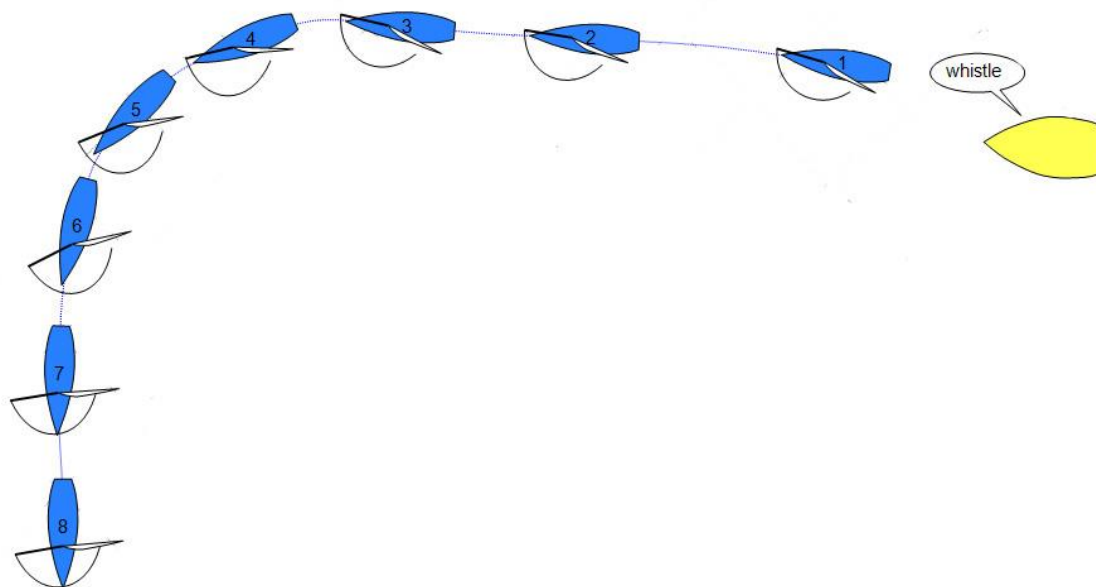
Boat balance is the main issue, when the crew gets in the boat, while they bear off to downwind. Ask the crew to move in gently as he unhooks himself, keeping the boat balanced and the spinnaker full. In medium conditions, the crew may heel the boat to windward while using a wave to bear off and surf.



- In the beginning, ask them to execute the manoeuvre slowly
- Marks on the boomvang and the spinnaker pole can be useful for the sailors
- We do not use a mark, on purpose, so we can save time on training by avoiding dropping and setting a spinnaker



Show them the videos that you took and pinpoint their mistakes





International 420 Class Exercise Book

'Tool' Exercises

24 TEAM GYBE



similar: 2, 13, 15, 16, 27, 29, 35

Improve gybe

(ideal wind conditions 9-12 knots)



L-20 min M-20 min



Level 2 - Racing

A – THEORY



Write on the whiteboard the procedure of the gybe, with the help of your sailors

Helm / crew

Step 1

Step 2...

B – ACTION



- One rib
- One 420 dinghy per team



1. Synchronize helm and crew
2. Keep the spinnaker flying (during the gybe)



- Line them up downwind and set the spinnakers. Keep 2 boat lengths distance between them. Follow the boats from a safe distance. Ask them to gybe when you whistle and mention to them their mistakes. Also, during the gybe you can help them or correct them to execute the manoeuvre properly.
- If a boat cannot execute the exercise properly or follow the other boats, you should separate them from the other teams and help the crew to improve by pointing out their mistakes.




When the team that withdrew executes the gybe correctly, line up all the teams again and let them execute the 'Domino Gybe'.



Note their mistakes and congratulate them on the good points!




International 420 Class Exercise Book



combined: Blind Gybes on downwind
similar: 1, 12, 14, 18, 26, 28

Improve your reflexes and self-confidence

L-18 min M-18 min



'Tool' Exercises

25 BLIND TACK

Level 2 - Racing

A – THEORY



Show them a tack that others tried out and they completed successfully. Now it is their time!

During the blindfolded tack the helm has additional responsibilities, checking to windward for boats coming before tacking and looking after the crew for any mistakes in order to act fast and correct them.

Helm:

1. Say "Tacking"
2. Start pointing slowly
- 3b. Pointing on Maximum
4. Cross to the other side
5. Sit down while you change hands
- 5b. Trim in the main sail
6. Look at the top batten if the leech has the proper tension.

Crew:

2. Unhook
- 3a. Get in the boat
- 3b. Unclear the jib
4. Cross to the other side while picking the new jib sheet
- 5a. Trim in and
- 5b. Get on trapeze
6. Feel the pressure on jib sheet

B – ACTION



- One rib
- One 420 dinghy for each team
- A blindfold (even a hair-elastic band) 5cm-wide



1. Building the self-confidence of the sailors to execute the exercise is important
2. To execute the tack in a pure reflex way with 'no thinking' attitude



- First warm them up with normal tacks
- Afterwards ask the crew to wear the blindfold
- Encourage the crew and find the way to make him feel confident



During the first tacks steer very close to the boat and help the crew to tack according to the proper steps.



- Practice some blindfold tacks ashore
- As the time passes, remove the blindfold from the crew, execute some tacks and put it back on
- After you complete this exercise, repeat the same with the helmsmen by keeping the boats further away from each other



Ask the crew to pinpoint their difficulties on 'feeling' the boat while blindfolded.



ziegelmayer
international one design racing sailboats



International 420 Class Exercise Book



combined: with gybes
on downwind
similar: 1, 12, 14, 18, 25, 28

Optimise rolling tack



L-25 min



Advanced Manoeuvres

26

DOUBLE IT

Level 3 - Advanced

A – THEORY



Mention to the teams the important points

- Rolling in to windward – coordination between helm and crew
- Back wind of the jib
- Exit with flat boat after tacking
- Explain to them when is the right moment to roll the boat

If you manage to execute a really good double tack and the speed after the tack is high then you need to focus and perform likewise in other exercises too.

B – ACTION



- One rib
- One 420 dinghy for each team

1. Coordination between helm and crew
2. At which moment, the crew will roll the boat for the second tack
3. The speed of the boat after the second tack



Follow them and whistle for tacking



The main issue is to roll the boat at certain moments, specifically just before the jib is fully backwind. The boat rolling and the backwind of the jib helps the boat to bear away fast and it will help to have the maximum speed after flattening the boat.



- This drill can also be used as a warm up exercise for advance level sailors
- This is an exercise that time is needed so even the small details/adjustments are corrected
- Be patient and positive for the final result
- Make several videos



It would be beneficial if you had a video of the exercise performed, so you can see what needs to be improved.



International 420 Class Exercise Book

Advanced Manoeuvres


SAFE GYBE


combined: with tacks
on upwind
similar: 2, 13, 15, 16, 24, 29, 35

Gybe without capsize

H-20 min


Level 3 - Advanced

A – THEORY



Remind them all of the safety rules should one of the team's boats capsize. Keep enough distance from them when they are gybing to avoid any collision among yourselves, but within communication distance.


Helm:

1. Say "Gybe"
2. Never stand up from the leeward side tank (after gybe is the windward one)
3. Bear away to gybe on maximum speed by pulling the main sail when it is physical possible to pull it to the other side.

GYBE

4. Control the fore and aft balance
- 6b. Pass to the crew the spinnaker sheet
7. Stand up and sit on leeward tank

Crew:

2. Grab both of the sheets with the back hand
3. Control the boat / balance before and after the gybe
4. Pass the Spinnaker sheets to the helm
5. Set the pole and sit down on the windward tank
- 6a. Set the guy in the cleat
- 6b. Get the spinnaker sheet from the helm



B – ACTION



A rib and at least one extra crew/sailor on board. The number of 420 boats that you are going to use depends on the level of your teams, always remembering that safety comes first.



1. Communication with the sailor
2. Control of the boat
 - a) Steering through the waves
 - b) Balance of the boat during or after the gybe (or both)



- Line up the team to downwind, set the spinnaker but keep enough distance between the boats, to avoiding any contact if anyone loses the control of the boat while gybing
- If the teams start performing well while gybing, upgrade the difficulty of the exercise and ask them to gybe within 10 seconds after your whistle



1. One of the main problems for the helm is how to steer and keep the control of the boat. Ask him to steer the boat fast, especially through the gybing moment
2. It is very important to keep the bow out of the waves
3. For the crew the main issue is to keep the balance of the boat especially right after the gybe
4. If the crew(s) cannot perform the above exercise properly, you ask them to abandon it and perform regular gybes without spinnaker



- If the helm loses control of the boat, he should ease the leeward sheet and reduce the power of the spinnaker until he regains control of the boat. Then he can sheet back in. Difficulties that may occur here is that the spinnaker sheet may pass over the boom
- Ask the helm to hike while the crew sets up the pole and steers the boat higher than normal if possible



The debriefing will be longer than normal because you must discuss and comment on:

- Mistakes on gybe especially on balance
- The reasons that the boat capsized at times
- Ways to recover faster from capsize



International 420 Class Exercise Book



combined: 6, 15, 24
similar: 1, 12, 14, 18, 25, 26

Perform your tack



L-60 min M-45 min High Risk



Advanced Manoeuvres

28

**RHOMBUS
TACKS**

Level 3 - Advanced

A – THEORY



It is a useful exercise to teach sailors when working under pressure in tight situations.

B – ACTION



- One rib
- One 420 dinghy per team



1. The main difficulty is to manage all the boats to keep the proper distance and synchronize them to tack at the same time when they reach the 'Starting Zone'
2. Performing tacks under pressure



- Line up the boats on upwind on the same tack. The boat which is to windward of all is Boat A, the boat on her leeward is B and so on.
- Upon whistle, the exercise starts and the boat A tacks. After A completes the manoeuvre, Boat A and B count 7 seconds and tack, now they are on opposite tacks. When they come close, $\frac{1}{2}$ to $1\frac{1}{2}$ metre distance, they tack again away. At this moment Boat C tacks and she is on the opposite tack with Boat B. When B and C come close they tack and at the same moment A and D tack. Now A and B, C and D are on opposite tacks and when they come close, they tack again and so on.
- Explain/TELL the sailors that the exercise starts when all teams arrive at the starting zone at the same time.
- Ask them on the first three times to adjust and coordinate their starting points (a fourth time might be needed). If one of the teams is the leading one, it should readjust his position by bearing away to the other boat and adjust the position closer to the other boat.

2-4 teams required for the exercise

Be sure that they understand the above steps completely before they start the exercise.

Follow the boats, as after a couple of tacks they will start being under pressure. This way, you will be able to observe better small details that need to be corrected, on tack and on upwind technique, as well as film the whole sequence.



1. It is a useful exercise to make the sailors work under pressure in tight situations
2. If there is a difficulty for the teams to arrive in the starting zone at the same time, then divide the teams in two groups, if there are 4 (2-2) if there are 5 (2-3) and so on.... Try to keep them in groups of 2
3. After completing the exercise a couple of times, rejoin them as one group and start again

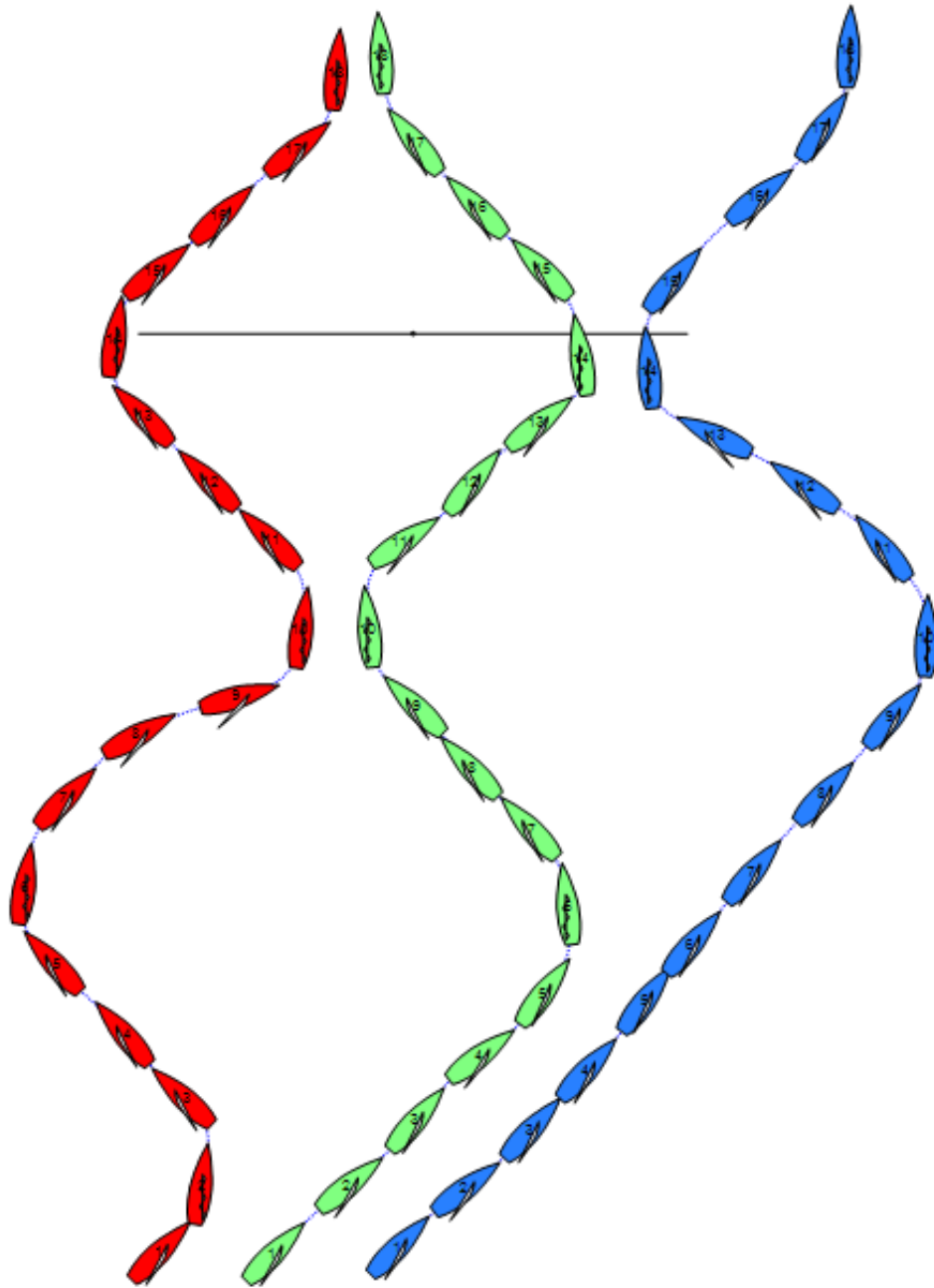


Do not execute this exercise when

1. the wind is shifty
2. it is windy and the team(s) is not at a high level




- Mention their mistakes and help them to understand them
- Afterwards, if it's possible, show them the videos






International 420 Class Exercise Book



combined: 1
similar: 2, 13, 15, 16, 24, 27, 35

Improve your skills
and boat balance

L-40 min M-25 min H-20 min



Advanced Manoeuvres

29 GYBING

FROM REACH

TO REACH

Level 3 - Advanced

A – THEORY



Gybe in light wind

Helm:

1. Say "Gybe"
2. Bear away, uncleat the jib
3. Keep bearing away, ease the main sail
4. Stand up and grab both of the spinnaker sheets
5. Roll the boat and gybe by bearing away
6. Head up to reach
7. Keep the spinnaker full by trimming the spinnaker sheet
- 9b. Sit down on the leeward tank
10. Trim the main sail

Crew

- 3a. Stand up
4. Pass the spinnaker sheet to the helm
5. Roll the boat and gybe
6. Set the pole
8. Cleat the guy
- 9a. Sit on the windward tank



Gybe in medium wind

Helm:

1. Say "Gybe"
2. Bear away, ease the main sail
3. Keep bearing away, uncleat the jib
4. Stand up and grab both of the spinnaker sheets
5. Gybe by bearing away
6. Head up to reach
7. Sit down and hike by keeping the spinnaker full
9. Head up
10. Trim in the main sail

Crew:

- 1.2. Unhook
2. Get in by balancing the boat
3. Pass the spinnaker sheet to the helm
4. Pull the boomvang to gybe the main
5. Set the pole
8. Cleat the guy
9. Grab the leeward spinnaker sheet
10. Hook on and get on the trapeze

Gybe in strong wind

Helm:

1. Say "Gybe"
2. Uncleat the jib
3. Ease the boomvang
4. Bear away until downwind
5. Pull the main sail to gybe when you find the right moment
6. Grab the spinnaker sheets from the crew
7. Full hiking
9. Pass the leeward spinnaker sheet to the crew
11. Head up to reach
12. Trim in the main sail

Crew:

2. Get in the boat and keep the kite full
3. Trim the windward guy
4. Grab the windward and leeward spinnaker together in one hand
5. Move to the new windward side and rotate the spinnaker
7. Set the pole
8. Cleat the windward spinnaker sheet
9. Grab the leeward spinnaker sheet
10. Get on trapeze and hike out

B – ACTION



- One rib
- One 420 dinghy for each team
- A video camera



1. How to keep the kite full after gybing with maximum speed, in light wind conditions
2. How to keep the boat balanced without capsizing in heavy wind conditions



Light air

- In light wind, stay next to the teams and remind them the procedures, step by step
- Ask them to move smoothly in the boat
- The trimming and the way of rolling the boat is very important. Help them find the right moment

Medium air and strong winds

- In medium wind conditions (same applies to **strong**), ask them to gybe when they are surfing on the waves and at maximum speed
- Boat balance during the gybe is crucial and the crew should keep the boat flat
- If the main sail does not gybe, abandon the gybe and try again
- The main sail should be trimmed so that the boom does not touch the shroud (wire), to avoid damaging it while gybing



Light air

- The main issue is that all movements in the boat should be smooth, including when setting the spinnaker pole
- The team should steer the boat with their body weight

Medium air

- Keep the boat balance fore and aft, without letting the bow down (diving in the wave)




The level of difficulty increases in strong winds.



Project on the screen several videos of each team and ask them to mention their mistakes. All details should be mentioned.




International 420 Class Exercise Book



combined: 31
similar: 20, 33

How to defend
your position at starts

L-60 min M-60 min H-30 min



Advanced Manoeuvres

**ATTACK
ON
WINDWARD**

Level 3 - Advanced

A – THEORY



After watching the video, analyse with the teams how to defend their position and the different ways of attack and defence.



Helm:

1. Say "Tack"
2. Accelerate the boat by trim in the sails
3. Head up to tack

Crew:

3. Roll the boat to tack

After Tack

- | | |
|---|--|
| <ol style="list-style-type: none"> 4. Bear away to downwind 5. Head up to tack again 6. Backwind the main if you want to stop the boat | <ol style="list-style-type: none"> 4. Heel the boat on windward 5. Roll again the boat to tack |
|---|--|

Draw on the board the different ways of attacks and the possible defence actions.



B – ACTION



- Two marks with anchor
- Minimum of two 420 dinghies



1. Calculating the minimum space to tack
2. Preventing the boat from drifting



Course: set a starting line of 10-15 metres

Time: no time

Rules: stay at 1-2 boat zone length from the starting line

It will take several tacks for proper body coordination, therefore the above exercise should be performed over and over again.

Be patient as a coach and explain to them the right procedures:

1. How much they have to roll and
2. How much they have to bear away




Several times, after the tack, the crew needs to backwind the sail to stop the boat from moving forward. Additionally, if the sailors cannot stay close to the starting area, set two more marks on the leeward of the starting line to minimize the starting zone area and keep them close (box starting area).



It will be helpful for the sailors to see their mistakes on the screen but before that ask them to point out their mistakes.



International 420 Class Exercise Book



8


combined: 20, 30

Ready to start at any moment and improve the reflexes and communication between the crew

L-120 min M-120 min H-60 min

Advanced Manoeuvres

'BE READY' OR 'ON FIRE'



Level 3 - Advanced

A – THEORY



Analyse the exercise on the whiteboard.

COURSE: set a starting line of 25 metres

RULE: in the last 15 seconds you can whistle any moment to give them the starting signal.

If you do not whistle any time in the last minute, they must start on 0 seconds.

ADVICE: it is good to decide in advance (for example in 1 minute) when to give them the starting signal.

- Additionally, you can set an upwind mark up to 70 metres (in strong winds a little bit more)
- time: 2 minute countdown

IMPORTANT: in the last minute you can whistle any moment and in 6 seconds you give them the starting signal so if you blow your whistle in 37 seconds the start is in 31 seconds. If you do not whistle any time on the last minute, they must start on 0 seconds.

Mark rounding the top mark and finishing on the starting line by mark rounding one of the two marks.



B – ACTION



- One rib
- Two marks with anchor



1. Keeping the boat close to the starting line
2. Keeping the boat ready at all times to accelerate on your command.



- Set a starting line
- Whistle any time you want the teams to start (after 6 seconds).
- Ask the crews several times to calculate the time and the distance between them and the starting line and advise them, if they are mistaken by more than 2 seconds.



1. Communication between crew and helm, what they should do and how
2. Coordination of their body movements to accelerate the boat



- After several starts give them the starting signal between 2 to 0 seconds
- A couple of times give them the start on 20 seconds before the 0 seconds



Ask the sailors to mention their mistakes and make your comments



International 420 Class Exercise Book

Advanced Manoeuvres

32 GYBE SET



combined: 9
similar: 8, 10

Perform a gybe set

L-60 min M-60 min H-40 min



Level 3 - Advanced

A – THEORY



1. Throw the spinnaker

Two ways to set the Spinnaker

- Throw the spinnaker
- First the pole

Helm:

- Bear away for mark rounding
- Ease the main sail
- Gybe with:
 - Tiller between your legs or tiller extension in your hand
- 4.1 Hoist the spinnaker
- Grab both the spinnaker sheets
- 6a. Sit down (first)
- 6c. Hand the spinnaker sheet to the crew
- Trim the jib
- Raise centreboard
- Ease cunningham in medium and strong winds

Crew:

- Ease the jib
4. Throw the spinnaker in front and leeward of the jib
5. Set the pole
6. Cleat the windward spinnaker sheet
- 6b. Sit down (after helm) and
- 6c. Grab the spinnaker sheet



2. First the pole

Helm:

1. Bear away for mark rounding
2. Ease the main sail
- Gybe**
3. Tiller between your legs or tiller extension in your hand
4. Start to hoist

Crew:

2. Ease the jib
- 3.1 Cleat the jib
4. Set the pole in the guy and
- 4.1 Push out the pole by trimming the guy
5. Cleat the guy, (sit down)
- 6.1. Grab the spinnaker sheet

7. Trim the jib
8. Raise the centreboard
9. Ease the cunningham in medium and strong winds

B – ACTION



- A rib
- Two marks with anchor
- video camera



1. The difficult part of this exercise is to properly hoist the spinnaker
2. Coordination between helm and crew to fly the spinnaker
3. In heavy conditions gybe immediately by balancing the boat

Course: windward leeward

Rules: 1. 3 tacks upwind
2. Touch a mark 360 degrees



Follow the sailors and

- Help them to coordinate their movements, especially at the moment of hoisting
- Remind them all of the important details and push them to work to make the spinnaker full



While hoisting the spinnaker, watch the head of the spinnaker to avoid getting it tangled with the top of the jib



- If the sailors are not improving in hoisting, pause the exercise
- Ask them to sail downwind by hoisting and dropping the spinnaker several times on windward side on port tack
- If they do not perform well gybing pause the exercise and execute several gybes without the spinnaker (exercise 35 – Gybe without Spinnaker)



Ask them to mention all the details of the exercise, what they learned from it and what should be the next immediate steps for self-improvement.



International 420 Class Exercise Book

Advanced Manoeuvres

STAY CLOSE

8

similar: 30

How to keep your position and stay close to the boat to windward

L-75 min M-65 min H-50 min

Level 3 - Advanced

A – THEORY



Analyse the points below to the sailors

- Centreboard should be all the way down
- Analyse what makes the boat drifting on sideways or backwards depending on the wind conditions.
- Waves / Wind / Current
- What happens if we trim only the main sail
- What happens if we trim only the jib
- What happens if we backwind the main sail
- What happens if we backwind the jib
- How the teams should accelerate the boat from 0 speed

B – ACTION



- One rib
- One mark and anchor for each 420 dinghy
- A video camera



Making the team work as **one** body



Set a mark in the water and ask them to stay as close to the mark as possible on the leeward side, all the time, behind an imaginary line passing from the mark, vertical to the wind.

Limitation of the exercise: they should try to prevent drifting as much as they can by trimming the main sail and jib. When teams drift more than a half boat length, they should tack to close the gap to the mark by accelerating the boat, double tack and slow down as soon as they get close to it. The double tacking procedure should take seconds; of course it depends on how far away from the mark the boat is. Put in extra effort so that the team stays behind the starting line and not crossing it.



Calculate the distance that they can cover by tacking in different wind conditions




- If the boat is stopped above close haul, teams must bear away fast: grab the jib from the clew, from the windward side and in front of the mast and pull it to the windward (you actually backwind the sail) and also heel the boat on windward
- Roll the boat slowly and only once, to avoid any penalty under rule 42.2
- Teach teams how to move backwards
- Make sure they understand how to bear off with the jib
- On the team exercise, make sure that you change the order of the boat several times




In the theory room project on the screen to your sailors the important videos where they can see their good and bad manoeuvres.



International 420 Class Exercise Book



8




Improve your tactics


L-100 min M-75 min H-60 min

Advanced Manoeuvres

34 CATCH UP



Level 3 - Advanced



A – THEORY



The goal is to catch up the boats which are ahead of you by using your skills in boat handling and especially in strategy and tactics.

Draw the course for the teams, explain the exercise very well and prepare 'a catch up' plan for the team that gets the penalty after the start.

Discuss with the sailors several different plans, made for various wind conditions.

B – ACTION



- One rib
- One 420 for each team
- Three marks with anchors
- A video camera



For the sailors to prepare a new strategy and tactic plan.



You set a one lap windward-leeward course approximately on L 12-13 minutes, M 8-9 minutes', H 8 minutes. In each race a different boat has a penalty of 720 degrees after start.

Set in your mind the order of the boats which should take the penalties.

It is important not to inform teams in advance, so that they are not prepared for the next step.

- Follow the boats after the start, especially the boat that took the penalty and note his 'catch up' plan
- Give some additional penalties to the teams who are leading during the training



Our 'catch up' plan depends on our boat speed which is one of the most critical parameters to reset our strategy and tactics after the penalty



- Advise the teams, not to sail in the corners/laylines of the race course, but instead they should try to improve their position by sailing fast and smart
- Remind them that during a training race, the best way to improve their place is by gaining one boat at a time and taking the least risk possible
- Jog their memory with several mistakes from the past or other most common ones that sailors usually do while exercising different tactics
- For weak teams or beginners, give them only a gybe penalty



In the theory room ask them to describe some of their good and failing catch up plans. Additionally ask them what they could do better in those races where they did not perform well.



International 420 Class Exercise Book



similar: 2, 13, 15, 16, 24, 27, 29

Improve your gybe skills
in strong winds



H-15 min



Useful Exercise

**GYBE
WITHOUT
SPINNAKER**

Level 3 - Advanced

A – THEORY



Analysis of the gybe without spinnaker.

The helm has to sit down at all times during the gybe and has to switch the main sail.

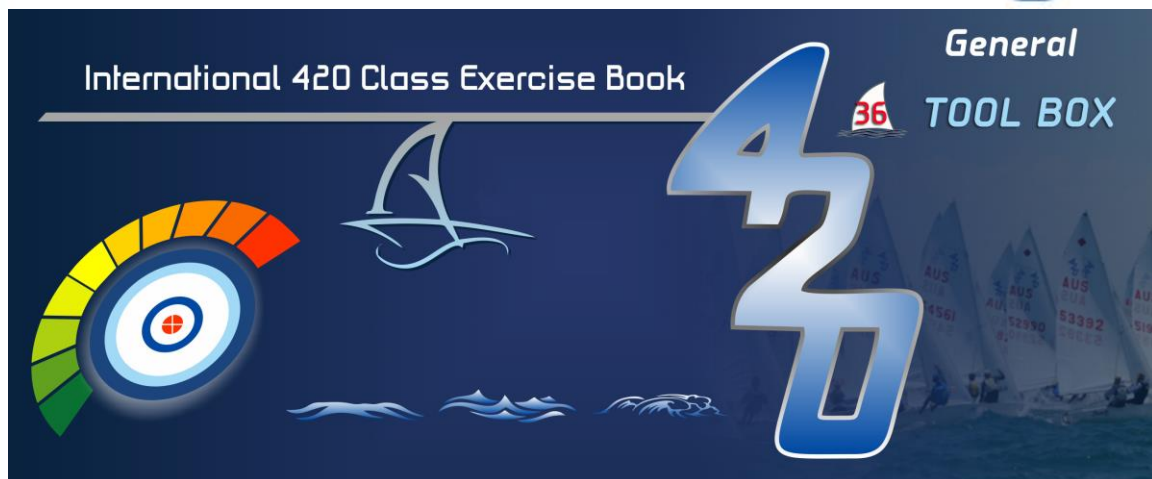
The crew has to keep the balance of the boat.

After completing the gybe, the helm has to sit down on the new leeward side.

B – ACTION



Ask teams to sail fast, surf the boat through the waves and gybe. This exercise is very helpful for them to understand that during the gybe, they should keep the boat at high speed and the bow out of the waves at all times, otherwise they will be close to capsize, especially if they have too much pressure in the main sail.



Sport Sails Center
Baranowski
www.blueblue.pl



www.420sailing.org



Exercise e-Book