



Handling a Square Rigger



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Handling a Square Rigger



Sailing a square-rigger requires organization and teamwork to ensure that evolutions are safe and efficient.

The failure of a single crewmember to ease a line at the proper time can prevent the ship from tacking.

Throwing off a line at the wrong time can injure or kill a shipmate.

If any part fails, a ten minute operation can easily grow into an hour of hard labor.

That's why they are so good for training!

At the end of a voyage, the cadets faced calm and stormy weather, worked hard on the ships mission and:

- Show new group dynamics;**
- Developed leadership qualities;**
- Understand the organization of the ship;**
- Know the traditions, how to behave on board and how to interact with the crew;**
- Are courageous, self confident, and prepared for the unknown;**
- Understand the sea and the wind and their effects on the ship.**



Handling a Square Rigger



Contents:



Setting sails



Trimming the sails



Polar Diagram



Use of engine against the wind



Tacking through & Wearing around



Emergencies and heavy weather



Handling a Square Rigger

SETTING SAILS



Square sails need sailors to climb the mast before and after use;



Sails are set upwards;



Removing top sails assures de effect of reefing;

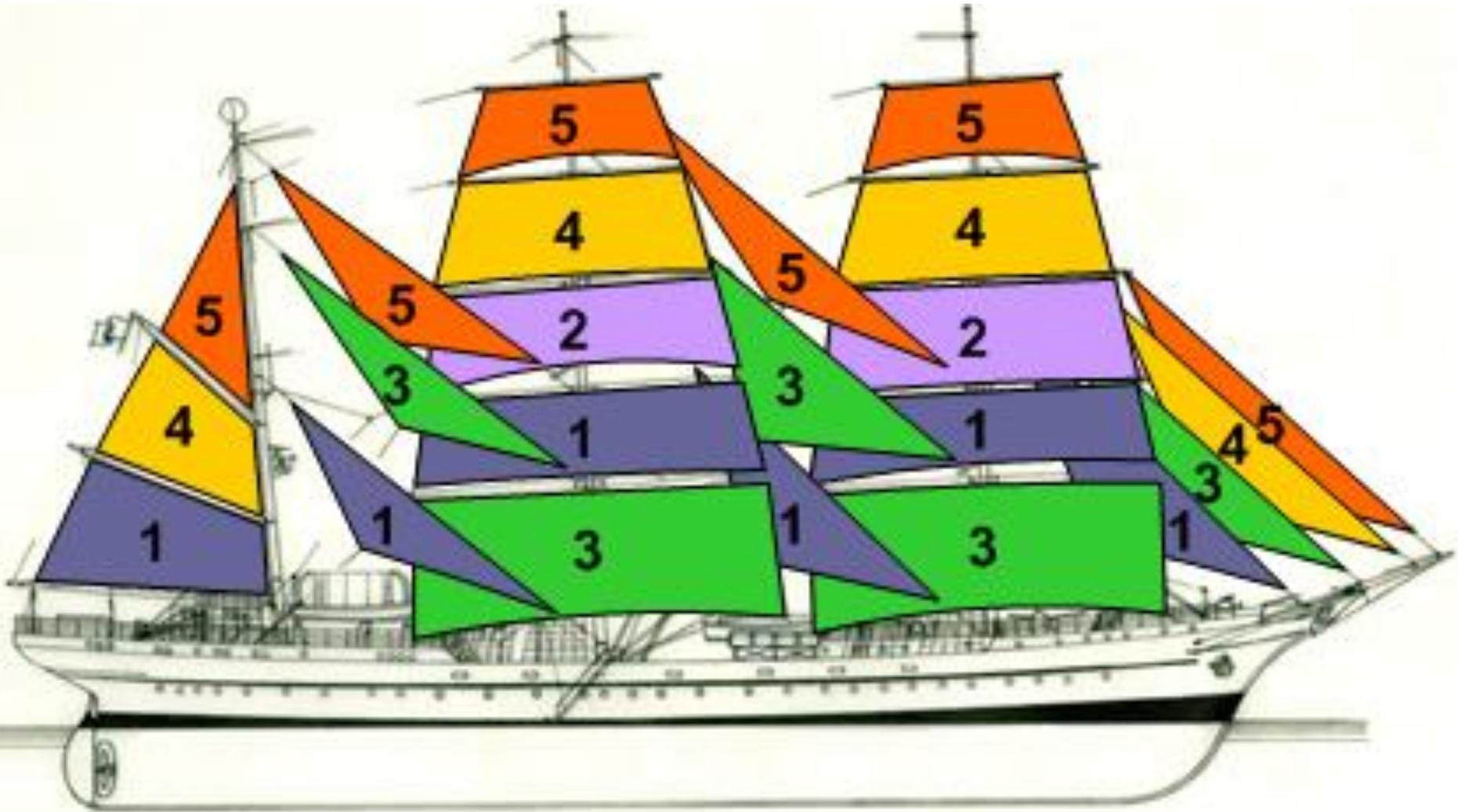


Sails allow for trimming and maneuvering;



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SETTING SAILS





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TRIMMING THE SAILS



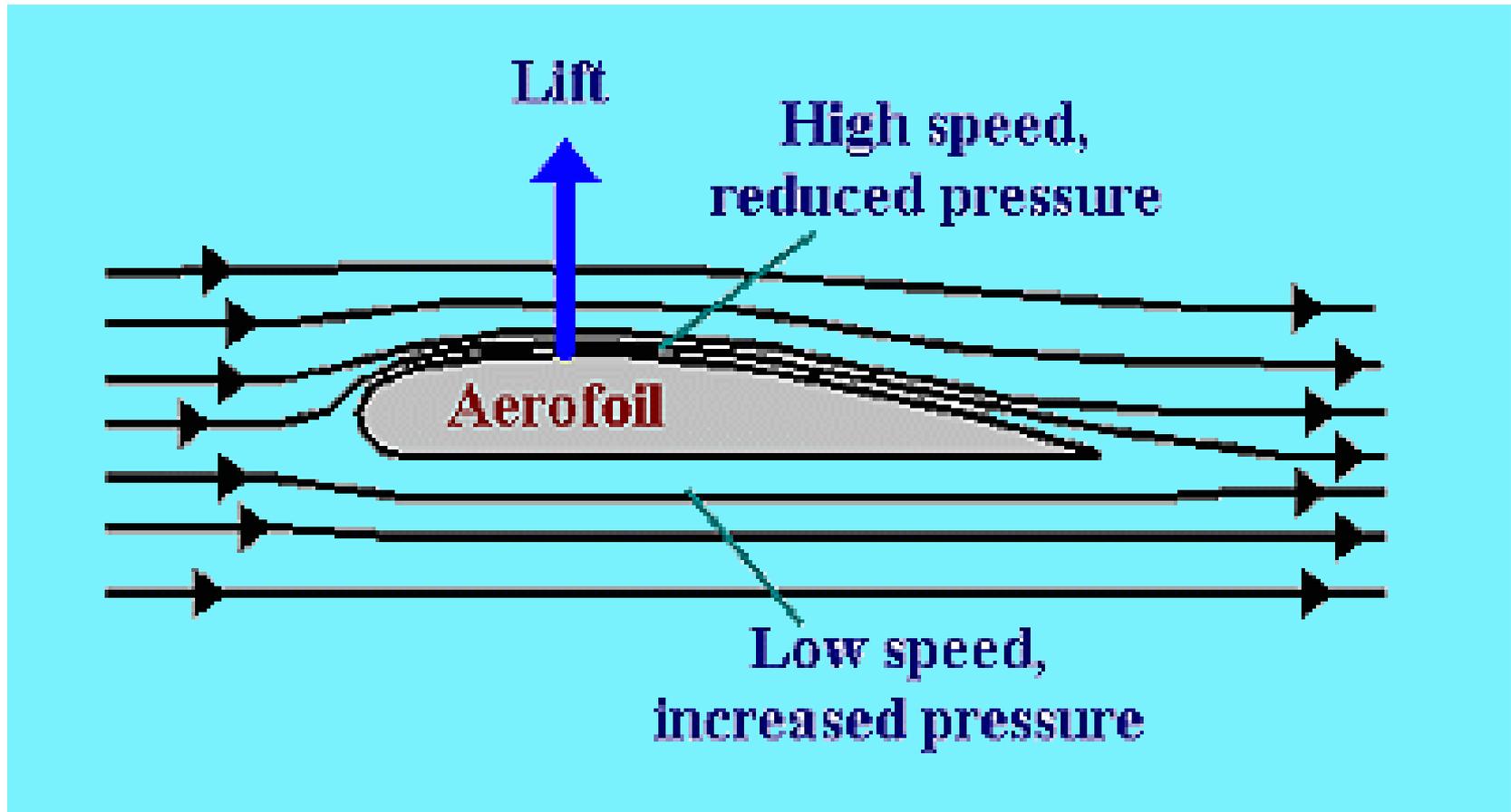
Aerodynamic & Driving forces

Push & Pull forces

Handling a Square Rigger

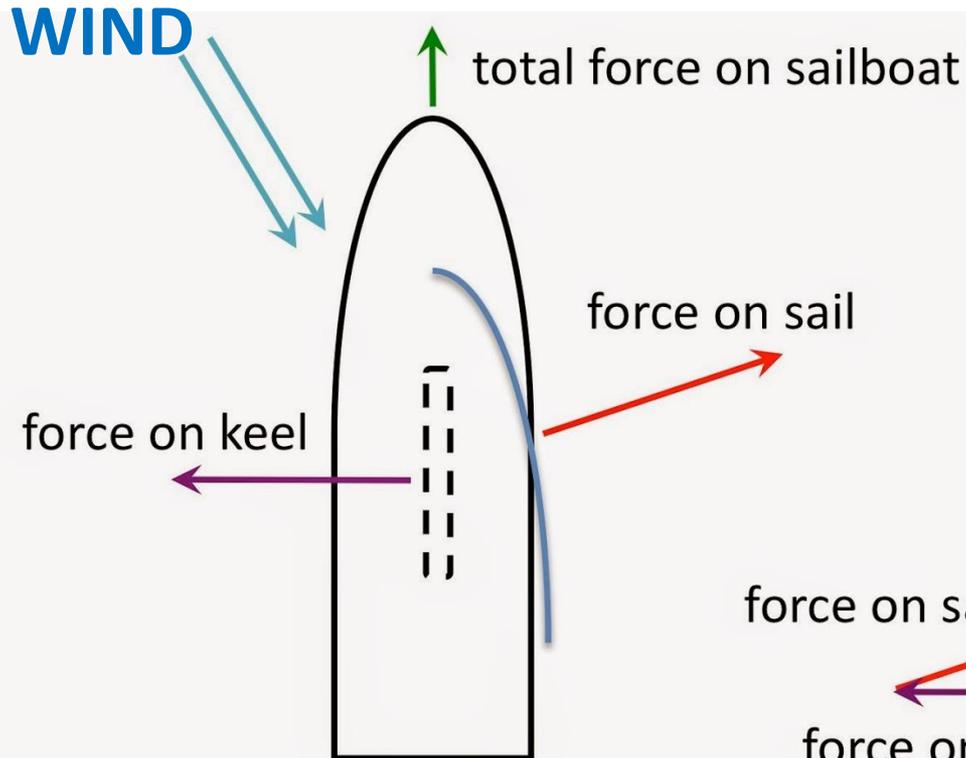
TRIMMING THE SAILS

Aerodynamics



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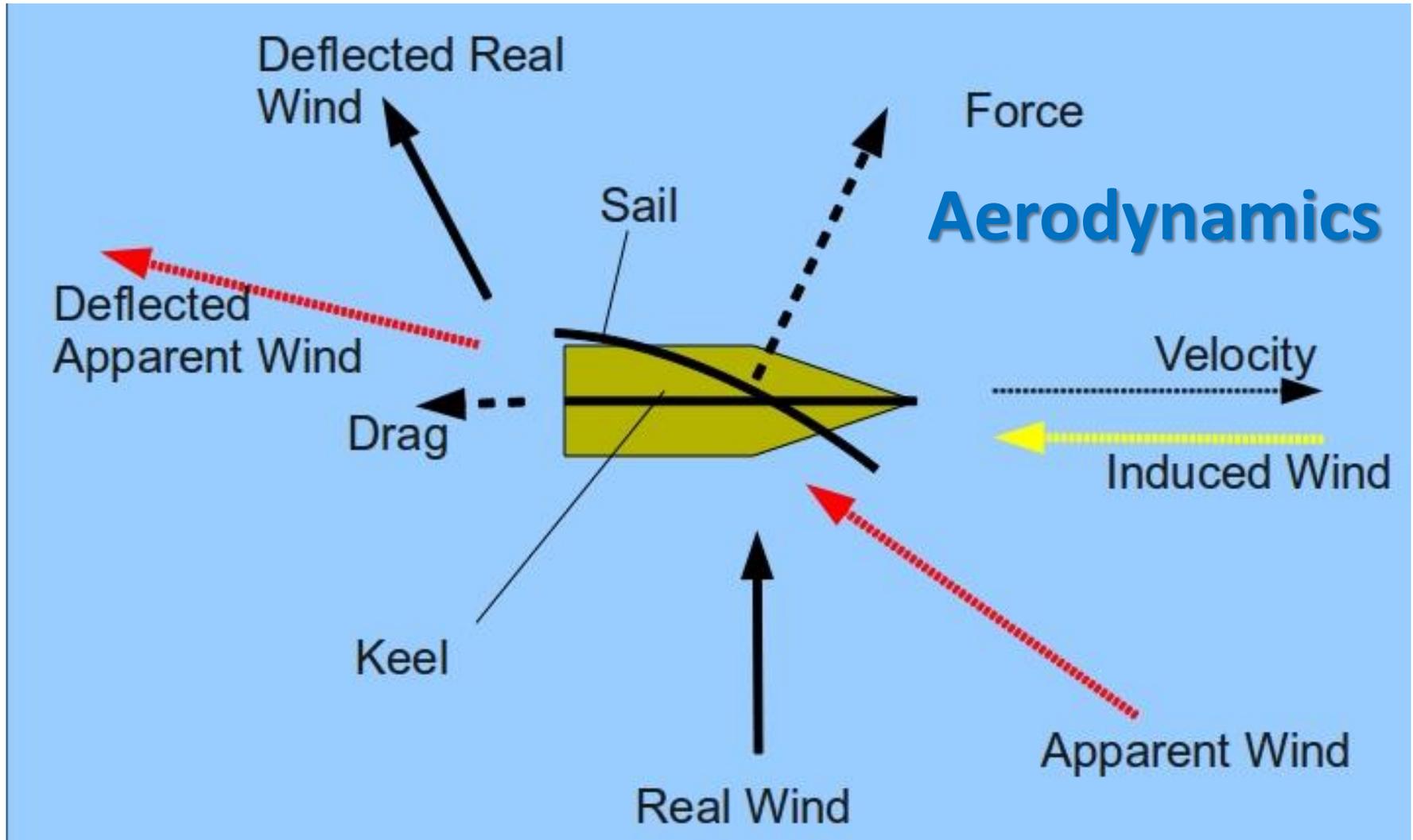
TRIMMING THE SAILS



Aerodynamics



Handling a Square Rigger TRIMMING THE SAILS

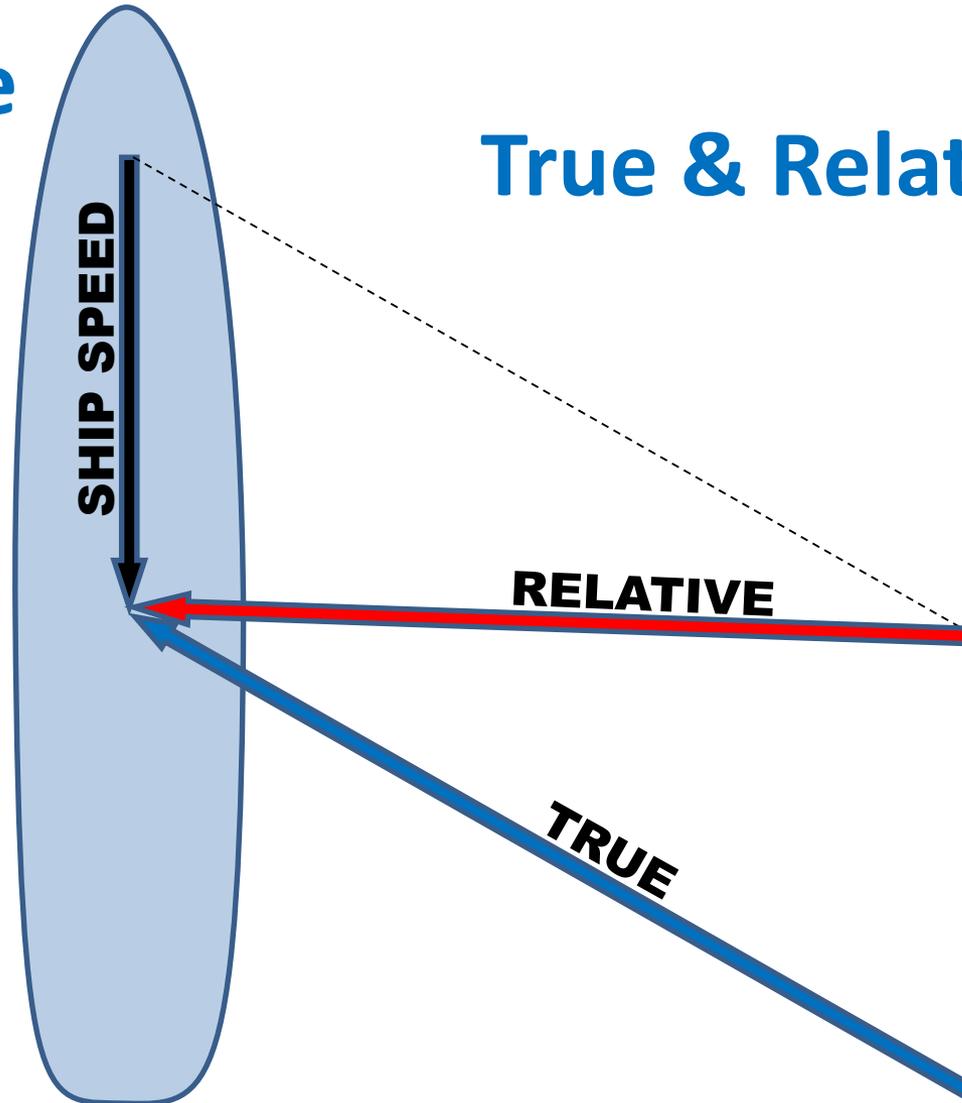


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TRIMMING THE SAILS

Driving force

True & Relative Wind

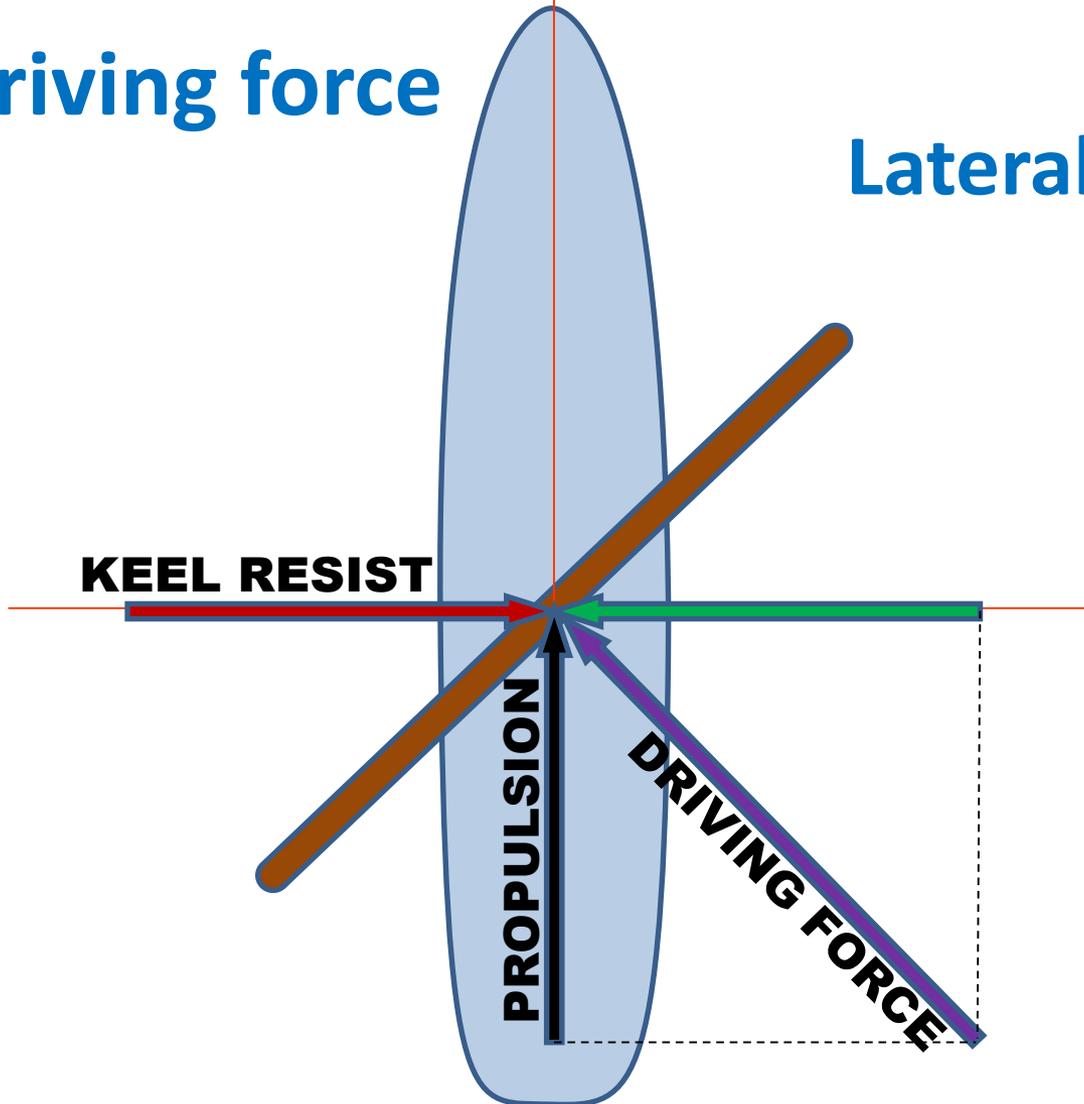


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TRIMMING THE SAILS

Driving force

Lateral & Forward Forces

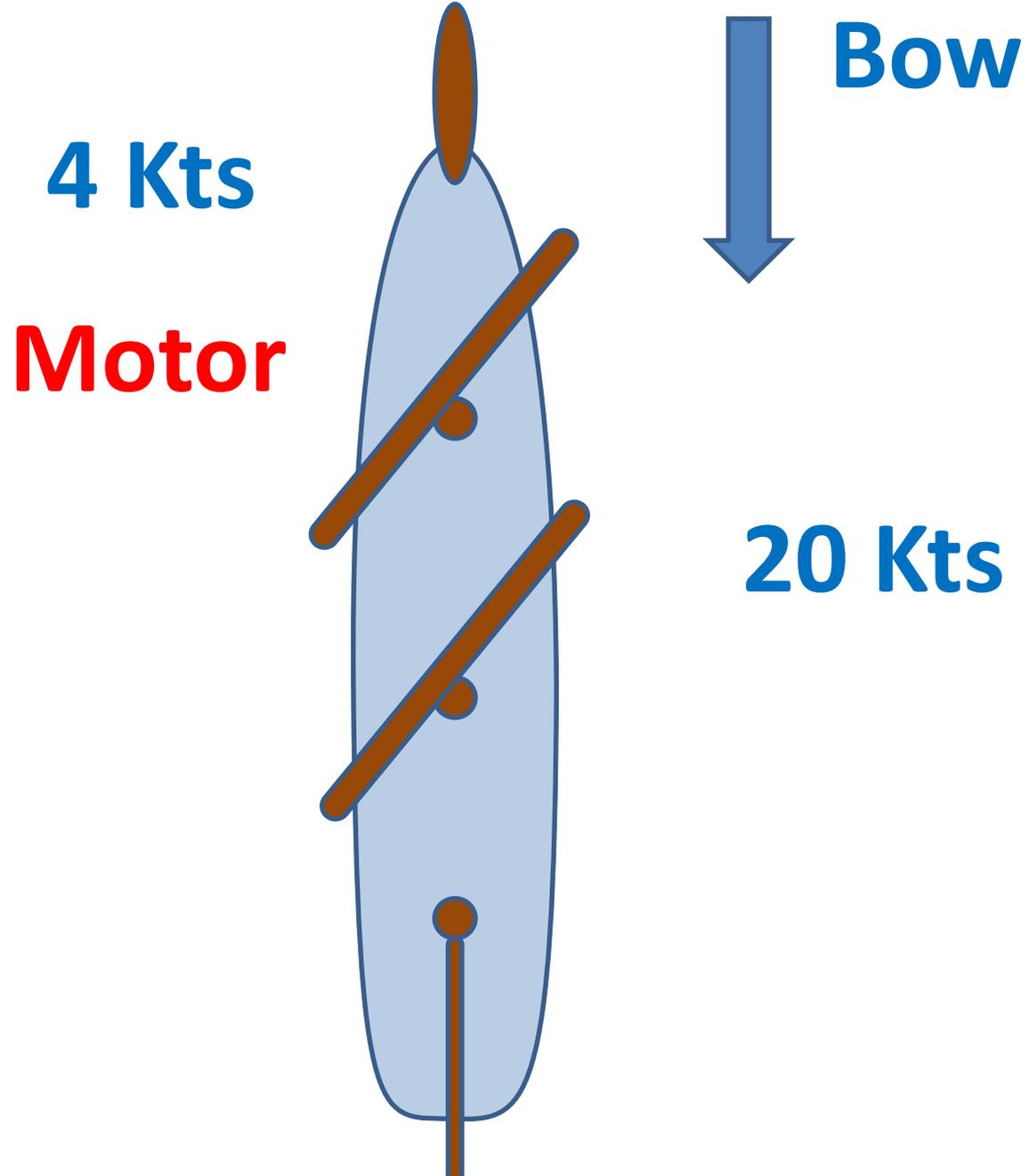


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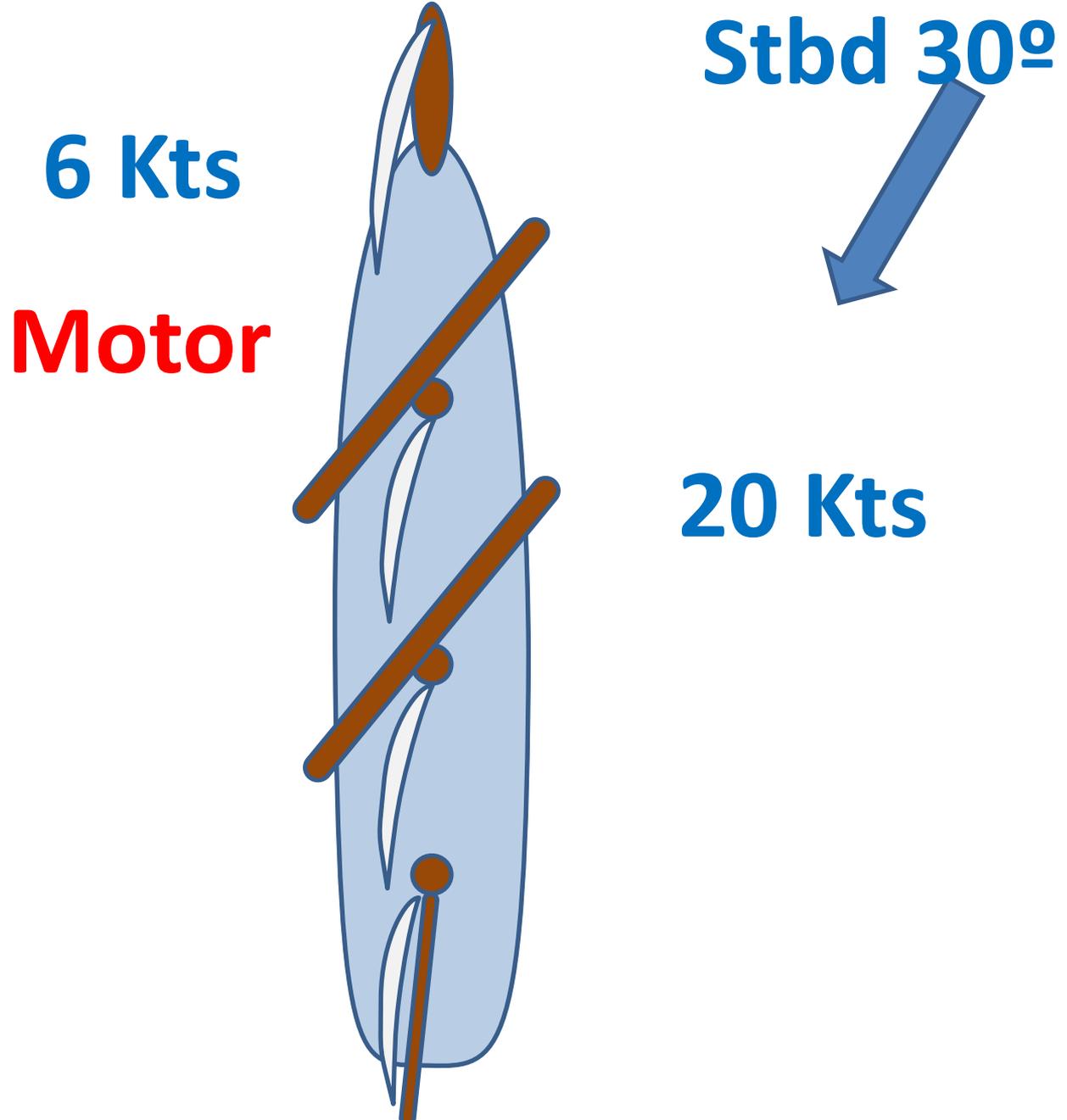
TRIMMING THE SAILS

Relative wind (degrees)	Yard Fanning	Foresail Mast		Mainsail Mast		Boom
		Foresail yard	Royal yard	Mainsail yard	Royal yard	
40°	---	---	---	---	---	0,5 qq
<60°	Yes	6 qq	5 qq	5,5 qq	4,5 qq	1,0 qq
60°	Yes	5.5 qq	4.5 qq	5 qq	4 qq	1,5 qq
70°	Yes	4.5 qq	3.5 qq	4.5 qq	3.5 qq	
80°	Yes	3.5 qq	3 qq	3.5 qq	3 qq	2,0 qq
90°	Yes	2.5 qq	2 qq	2.5 qq	2 qq	
100°	No	2 qq		2 qq		2,5 qq
110°	No	1.5 qq		1.5 qq		
120°	No	1 qq		1 qq		Sharp
130°	No	0.5 qq		0.5 qq		
140°	No	0.5 qq		0.5 qq		
>150°	No	Square		Square		

POLAR DIAGRAM

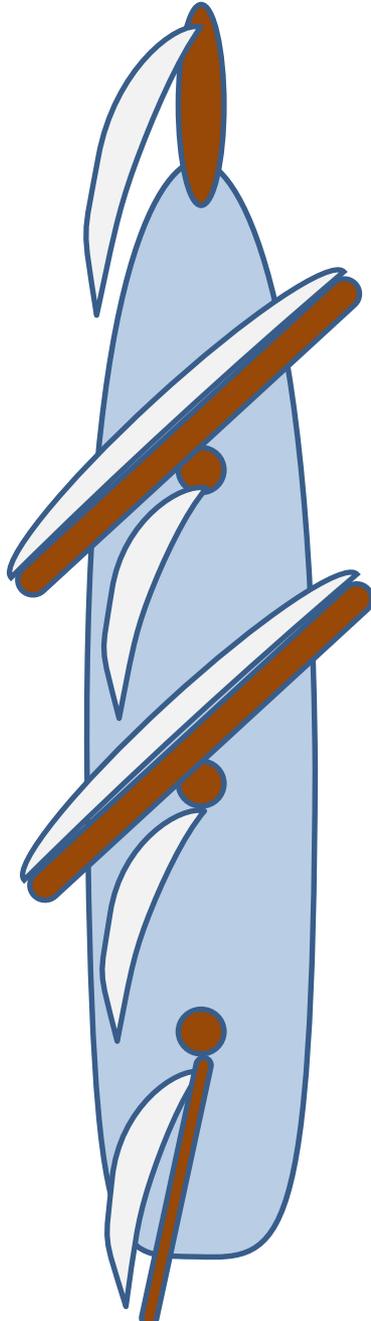


POLAR DIAGRAM

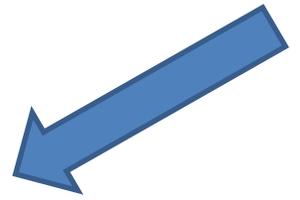


POLAR DIAGRAM

8 Kts



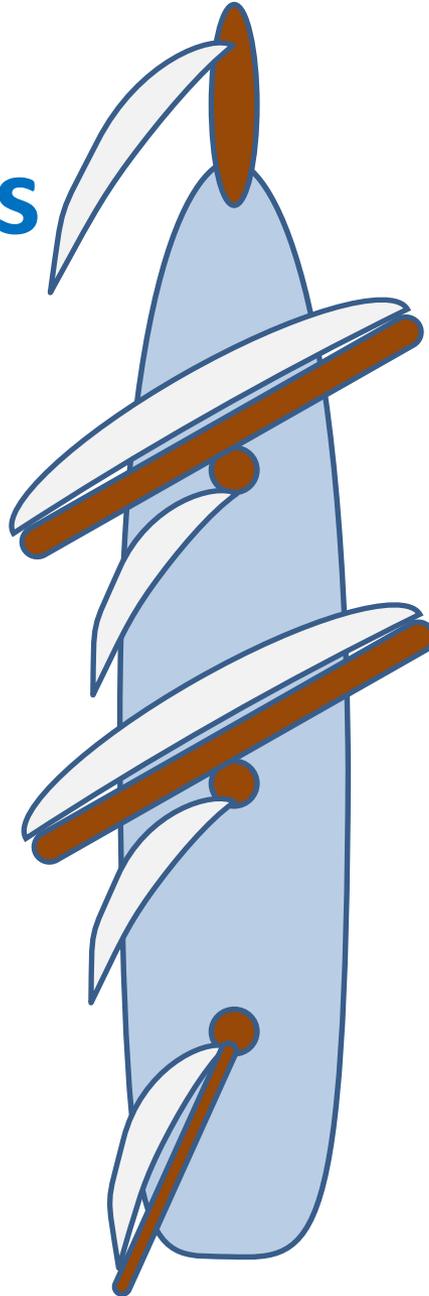
Stbd 60°



20 Kts

POLAR DIAGRAM

12 Kts



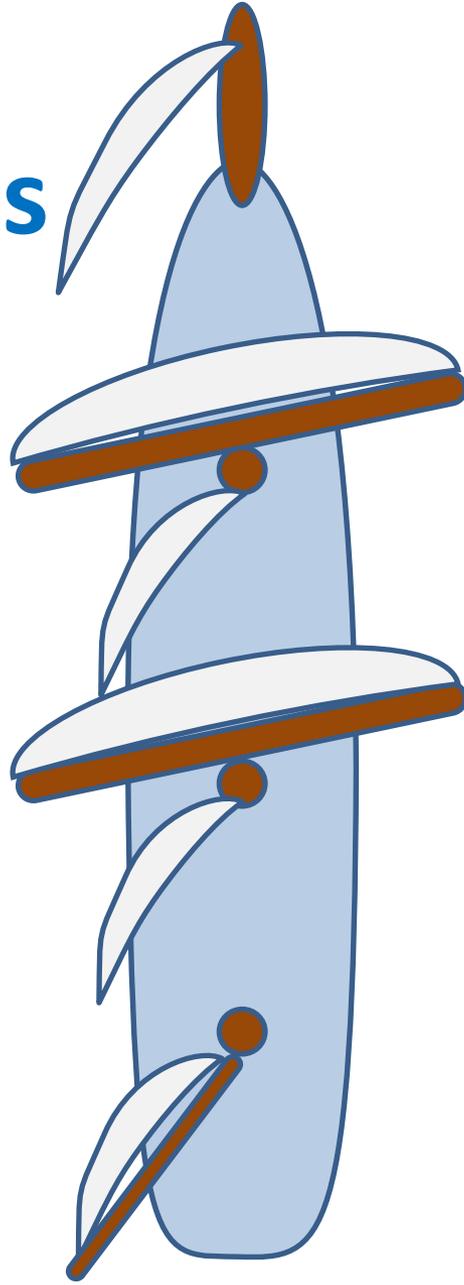
Stbd 90°

20 Kts



POLAR DIAGRAM

10 Kts



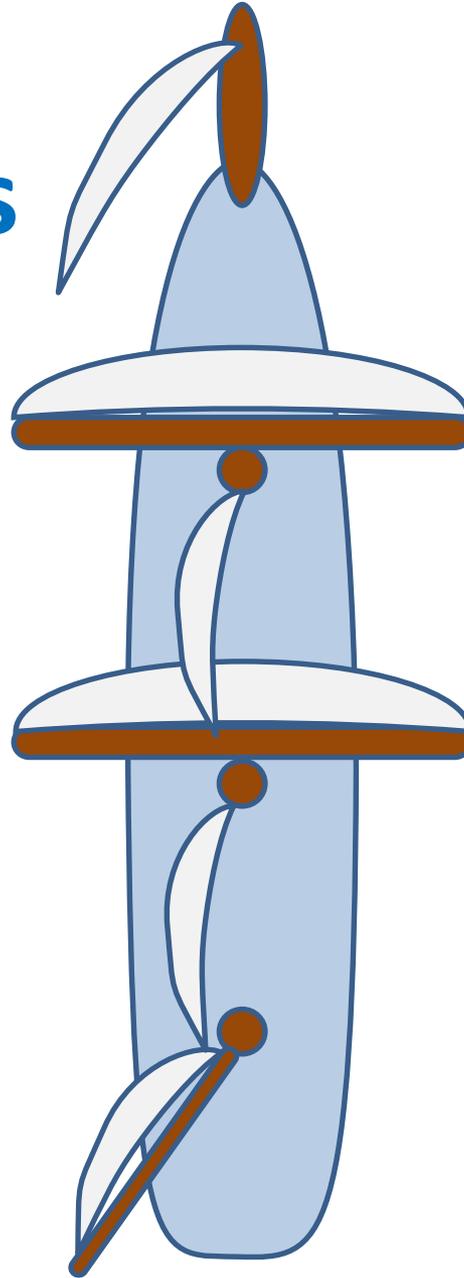
20 Kts

Stbd 120°



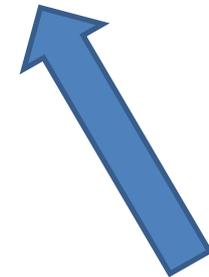
POLAR DIAGRAM

6 Kts



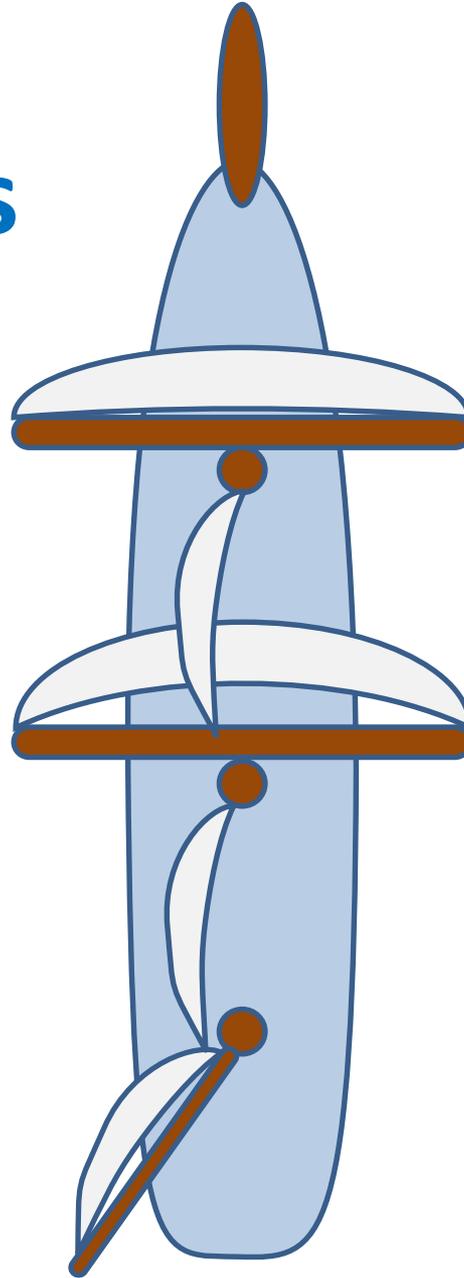
20 Kts

Stbd 150°



POLAR DIAGRAM

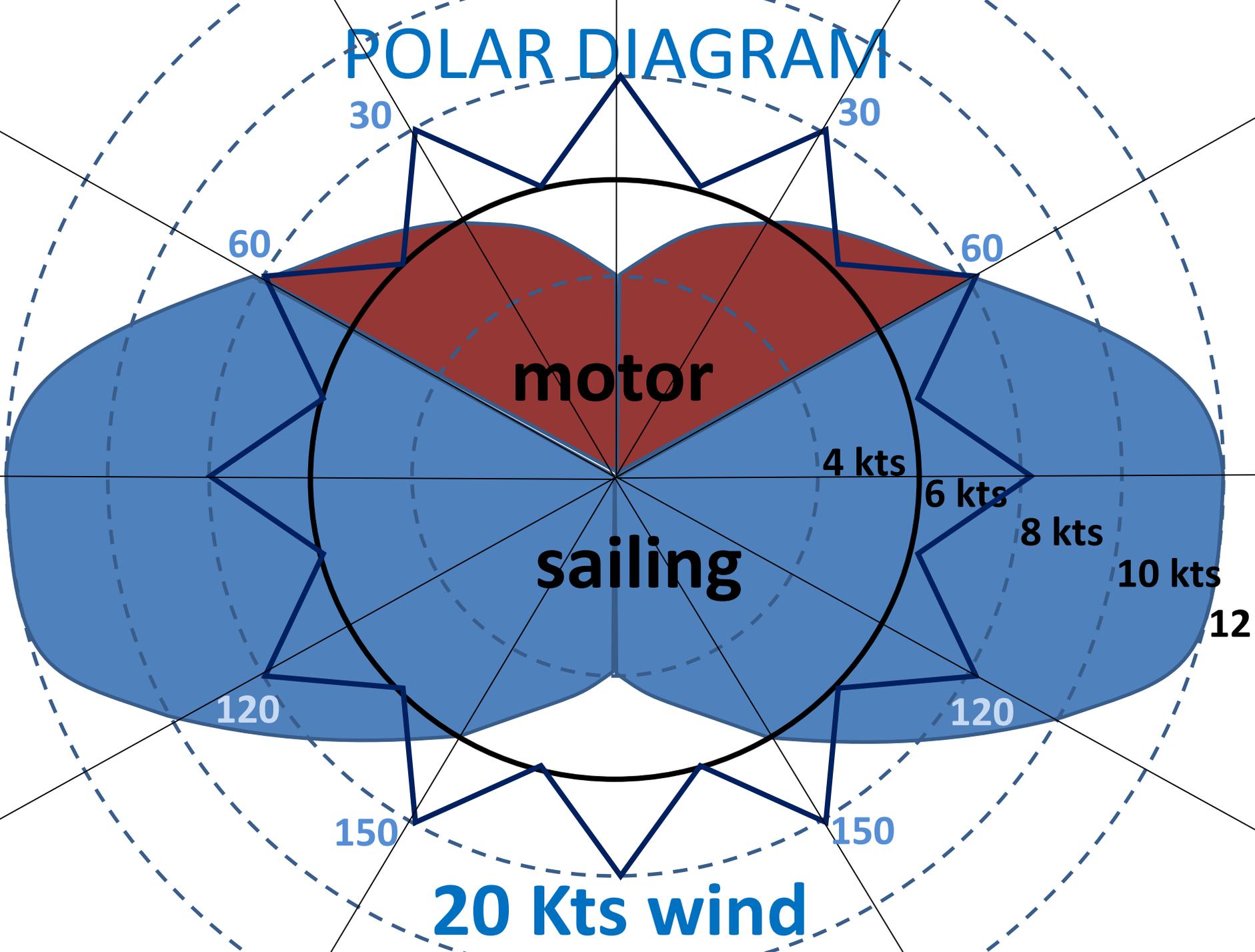
5 Kts



20 Kts

180°

POLAR DIAGRAM



motor

sailing

4 kts

6 kts

8 kts

10 kts

12

20 Kts wind

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TRIMMING THE SAILS

-  Yard $\frac{1}{2}$ angle btw bow and relative wind;
-  Cockbill – keep yards horizontal;
-  Fanning – wind faster in altitude; Less friction;
-  Tension sheets with strong winds;
-  Let the wind flow when on the back;
-  Use sails ahead or astern to balance and reduce rudder brake;

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MOTORING



Put the wind on 30 degrees;



Align yards with the wind;



Use Latin sails ;



Sails will give support to the engine and stabilize the ship;

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TACKING



Gain distance upwind;



More difficult; Timing is critical;



All hands on deck;



Conditions: Wind 10 - 25Kts; Speed 5 – 12Kts;



Trim the best; Gain speed;



Reduce contrary and exploit accordant forces;



Turn the ship;





Handling a Square Rigger

WEARING



Loose distance upwind;



More easy; More safe; Never fails;



Less hands on deck;



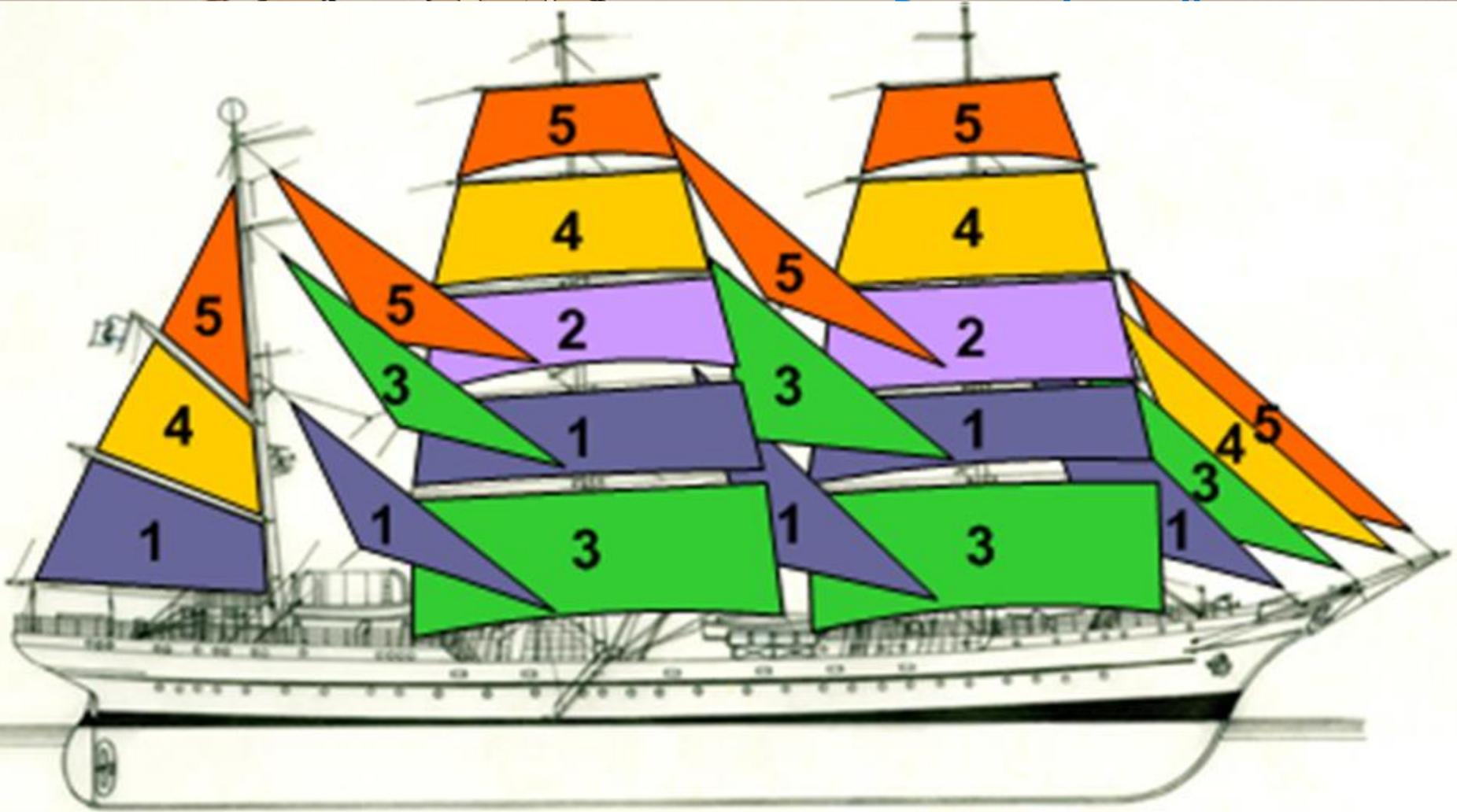
Conditions: Light or Strong Winds; Slow Ship;



Reduce contrary and exploit accordant forces;



Turn the ship;



Pano redondo à sombra



Pano latino à sombra



Pano redondo a grivar



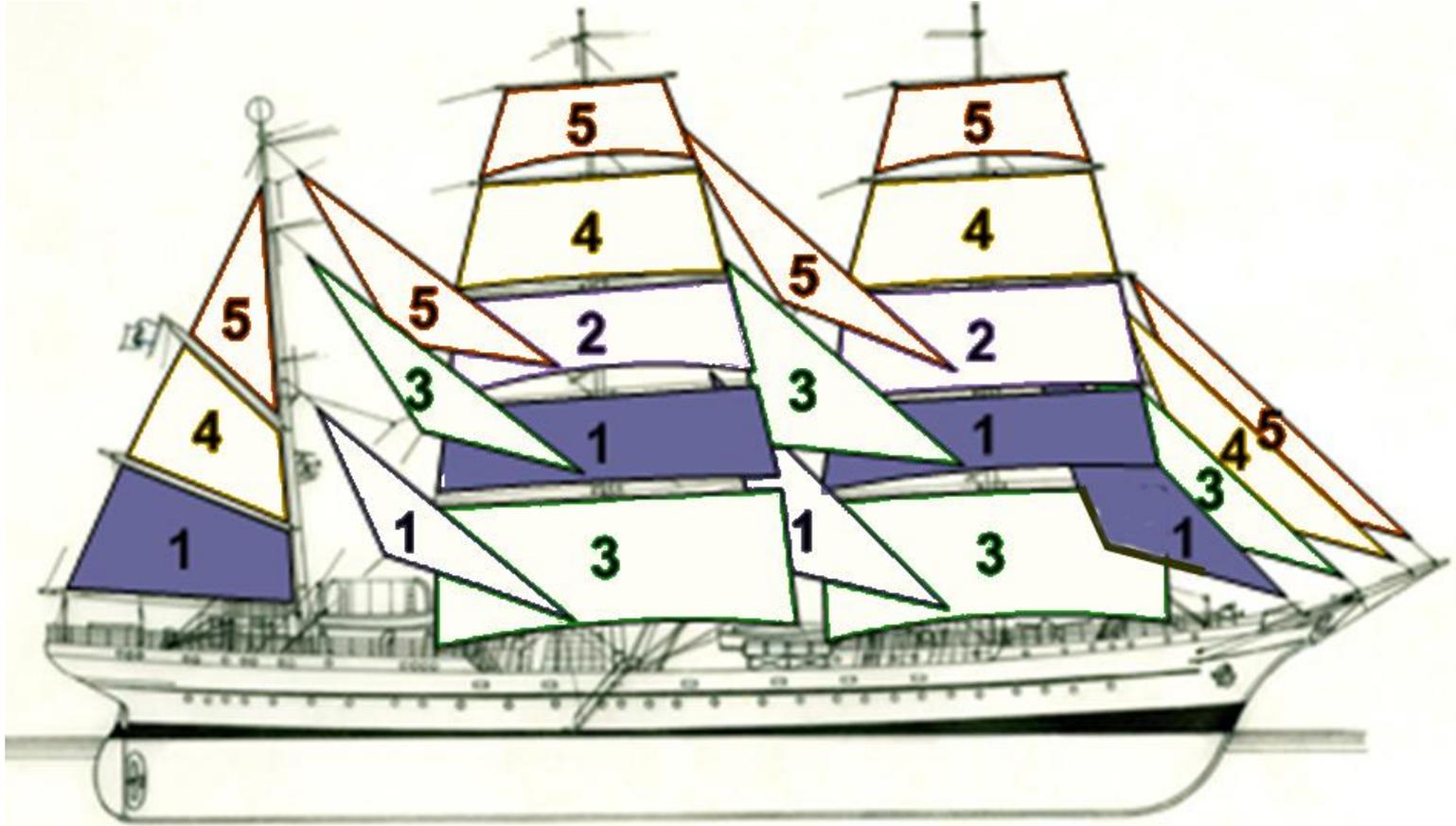
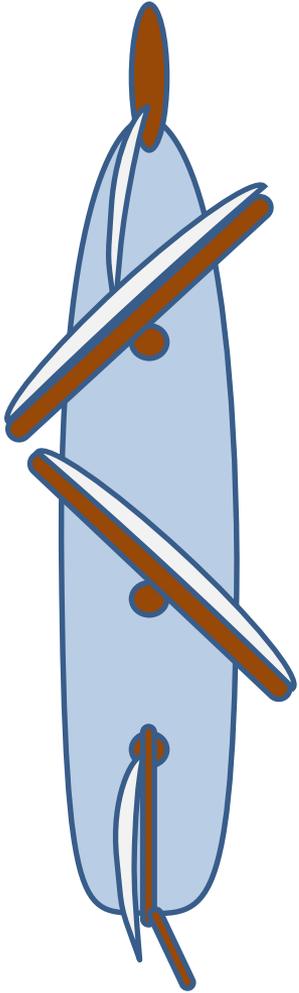
Pano cheio



R.P. SAGRES

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EMERGENCIES



Efeito turístico





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