

Anchors and Anchoring

Toronto Brigantine
Grade II



1

Why Do We Anchor ?

- Protection from a storm
- Provide rest for the crew
- Dock space not available in a harbour
- Stopping to see points of interest

2

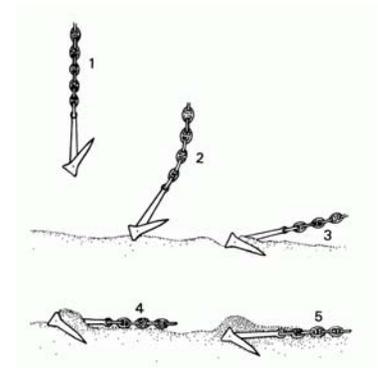
Things to look for when choosing an anchorage

- Water depth
- Bottom type (clay, sand, mud, rock, boulders, weeds)
 - Clay, sand and mud provide the best anchoring substrates
 - Rock shelves, boulders and weeds are the worst substrates
- Protection from predicted winds, protection from prevailing winds and currents or tides
- Number of boats in an anchorage
- Size of anchorage, for room to swing

3

Anchor Principles

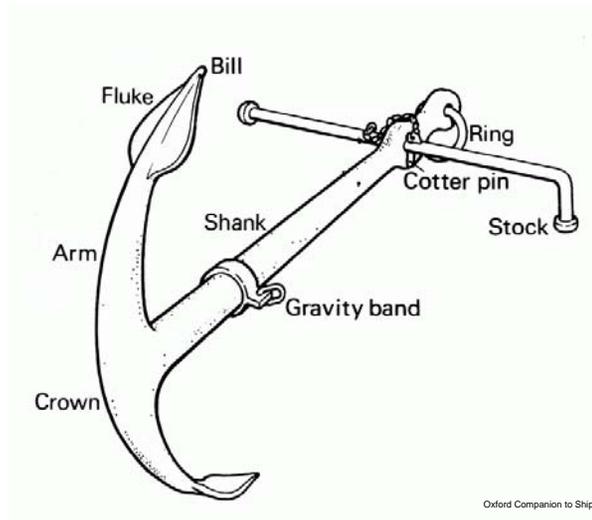
- Two general categories of anchors:
 - Heavy weights
 - Used for stationary objects like navigation bouys
 - Anchors that dig into the bottom
 - Used on vessels and combine weight and ability to dig into the substrate



Oxford Companion to Ships and the Sea 1988

4

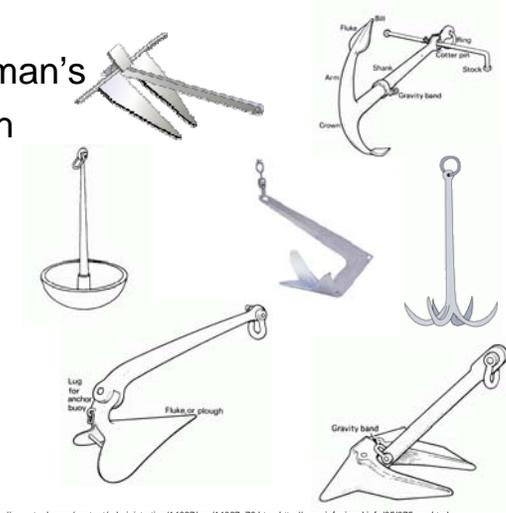
Parts of an Anchor



5

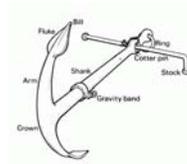
Types of Anchors

- A/P or Fisherman's
- Fluke/Danforth
- CQR/Plough
- Bruce/Claw
- Mushroom
- Grapnel
- Stockless



6

A/P or Fisherman's



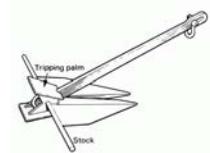
- non-burying type, with one arm penetrating the seabed and the other standing upright
- It has a good reputation for use in rock, kelp, and grass, but is unlikely to be any more effective than a good modern design and its holding power to weight ratio is among the worst of all anchor types
- The primary weakness of the design is its ability to foul the cable over changing tides

7

Danforth

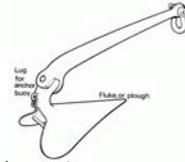


- The stock is hinged so the flukes can orient toward the bottom
- The design is a burying variety, and once well set can develop an amazing amount of resistance. Its light weight and compact flat design make it easy to retrieve and relatively easy to store



8

CQR/Plough



- generally good in all bottoms, but not exceptional in any.
- has a hinged shank, allowing the anchor to turn with direction changes rather than breaking out, and also arranged to force the point of the plough into the bottom if the anchor lands on its side.

9

Bruce/Claw



- Claw-types set quickly in most seabeds and although not an articulated design, they have the reputation of not breaking out with tide or wind changes, instead slowly turning in the bottom to align with the force.
- Claw types have difficulty penetrating weedy bottoms and grass. They offer a fairly low holding power to weight ratio and generally have to be over-sized to compete with other types.

10

Anchor Rode

- Chain
 - Heavy
 - Very durable
 - Does not stretch
- Line
 - Light
 - Can be easily chafed by rocks or coral
 - Stretches
- Combination of both
 - Chain attached to anchor, line attached to chain
 - Often used on small yachts
- Wire rope
 - Used on many fishing vessels

11

Capstans and Windlasses

Capstan

- Used on traditional vessels
- Bars attached allowing crew members to turn the capstan



Windlass

- Pathfinder:
 - Pawl-rack system, two handles are pumped back and forth
- Playfair:
 - Gear system, handles are attached and wound in a circular motion



12

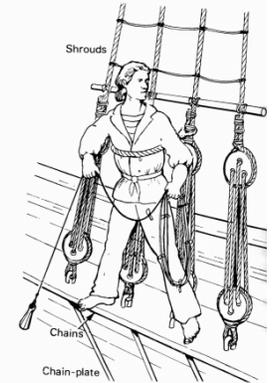
Catting the Anchor

- “The process of hoisting an anchor by its ring so that it hangs at the cathead”
- Anchor is unlashed from the deck
- Stock is inserted, bolted in place
- Anchor chain is overhauled and the end is brought up on deck (outboard of everything)
- Chain is shackled onto the anchor
- **Shackle is moused**
- Davit is rigged with a handy billy
- Anchor is raised off the deck with the handy billy and swung over the side
- Anchor is lowered with the handy billy as the slack in the chain is taken up
- Anchor is left dangling if it will be used immediately, or is lashed to the whisker stays if it will not be used.
- Catting also refers to bringing the anchor inboard

13

Depth Soundings

- Soundings are traditionally done with a lead line
- Electronic depth sounders send sound waves from a transducer on the hull, through the water that bounce off the bottom and back to the transducer



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14

Lead Line

- Line with lead weight
- Lead weight can be “armed” with something sticky (traditionally tallow was used) to determine what type of bottom is in the anchorage.
- Lead line is thrown from up forward
- Lead is thrown as far forward as possible
- You should feel it hit the bottom, take up slack as the boat moves towards it
- Markings should be read when the lead line is straight up and down beside the thrower
- Do not hit people or the boat with the lead
- Face the stern when calling the readings

15

Reading the Lead Line

Number of Fathoms	Markings on Lead Line	Depth in Fathoms	Call
1	Danger, an orange mark	1	By the mark danger
2	Two pieces of leather	1 ¼	And a quarter danger
3	Three pieces of leather	1 ½	And a half danger
4	No marking “Deep four”	1 ¾	Less a quarter danger
5	One piece of white sailcloth	2	By the mark two
6	No marking “Deep six”	2 ¼	And a quarter two
7	One piece of red cloth	4	Deep 4
8	No Marking “Deep 8”	4 ¼	Deep 4
9	No Marking “Deep 9”	6	Deep 6
10	One knot	No bottom	No bottom at x (x is the closest fathom)

16

Preparing to Drop the Anchor

- Supplies you will need
 - Hammer, or a Persuasion Bar if on Playfair
 - Make sure the star is turning without too much force so it will spin free when needed
 - Anchor ball and gash line
 - T-bar (Path), Crank handle (Play)
 - Flashlight if it's dark
 - Your brain and a loud voice

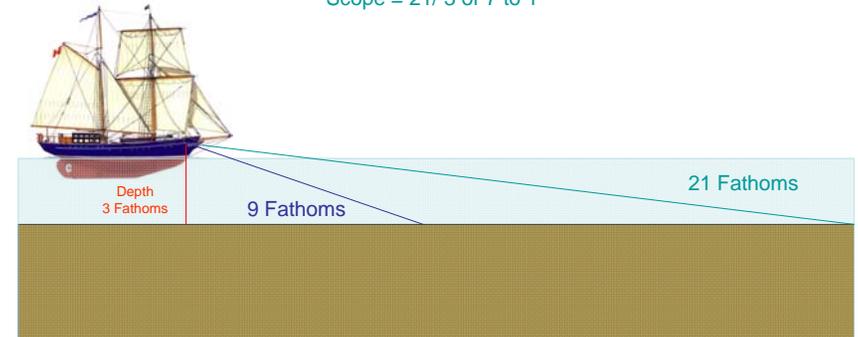
17

What is Scope

Scope = Length of Anchor rode / Depth

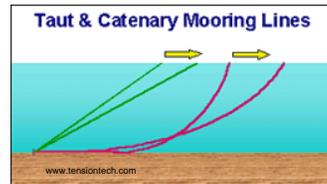
Scope = 9 / 3 or 3 to 1

Scope = 21 / 3 or 7 to 1



18

Catenary



- An anchor rode is not just a straight link between the bow and the anchor.
- If you could swim down alongside it, you would see it start from the bow at a fairly steep angle, then slowly flatten out until it blends smoothly into the bottom.
- Having a lot of sag in the rode reduces shock loads and helps keep the anchor dug in by reducing the angle between the rode and anchor.

19

How do you know how much anchor rode to put out?

- Stopping for a swim – 3:1 scope
- Stopping for the day – 5:1 scope
- Anchoring for the night – 7:1 scope
- These are rough estimates
 - If you were expecting a storm with high winds you might want a 10:1 scope
 - What should you be concerned about when you have that much scope?

20

Chain Markings

Fathoms	Marking
One	One red mark
Five	One white mark
Ten	One black mark
Fifty	One blue mark

Example: 22 fathoms would be two black marks and two red marks

What would 67 fathoms be?

21

Dropping the Anchor

- As you come into an anchorage your watch officer will yell "Stand by up forward"
- The bosun or PO will yell "Aye standing by"
- When the watch officer and Captain have decided where to anchor they will yell "Let go and veer to x fathoms"
- Bosun will respond "Aye x fathoms"
- The star will be loosened all the way allowing the gypsy to spin
- The anchor will drop very quickly until it hits the bottom
- Do not have hands or feet in the way, they will get mangled

22

Anchoring

- Often, the POs job is to watch over the side as the chain goes out, counting the markings until the desired mark has been reached.
- The Bosun will slow the release of the chain as you get closer to the desired mark
- The bosun will yell " 'x' at the water"
- If that is the desired mark the Watch officer will yell "That's well, dog her there"
- Bosun will reply "Dogging her there"

23

More on Anchoring

- The Watch officer will often put the engine in reverse to "set" the anchor, and dig it in
- Set the Anchor ball once the "Dog her there" order is given. The ball is raised on the jib halyard or forestays'l halyard, it should sit just below the course yard so as to be visible to the widest range
- Anchor light is turned on if it is dark

24

Even more on Anchoring

- The bosun then has 4 things to report to the watch officer
 - Number of fathoms of chain
 - Angle of chain (Up-and-down, that is pretty obvious. Short stay – 15-50 degrees, short stay will generally be roughly parallel to the Forestay. Long stay – greater than 50 degrees)
 - Direction the chain is leading – port, starboard, forward or aft
 - Holding status – holding or dragging
- Example: “45 fathoms at the waterline, short stay, leading forward, holding” **Face aft, and yell it loud**
- This will be done for about 10 minutes to monitor the anchor as the boat swings

25

Anchor Watch

- Many ways to monitor the movement of the vessel at night
 - Alarms can be set on the depth sounder, GPS or radar to show a change in the boats position, bearings can be taken to points on land
 - Trainees will be instructed to monitor the chain (lean over the side and feel if the chain is skipping over the bottom), wind speed, wind direction, and electronic instruments if directed.
- All observations must be recorded in the log book
- They must wake their watch officer if things change
- They must stay awake
- They must wake the next people for anchor watch

26

Why do Anchors Drag?

- Not enough scope
- Anchor rode is fouled around the anchor
- Wind direction/tide has changed
- Bottom does not allow the anchor to hold (eg boulders, shale/limestone shelves, weeds etc)

27

Weighing Anchor

- Generally we will “heave short” to about 2:1 or 3:1 while getting ready to leave. **Make sure the Chain-Dog is removed before starting to haul chain up**
- When it is time to actually weigh anchor the Watch Officer will yell “Stand by up forward”
- Bosun will reply “Aye, standing by”
- WO will call “Weigh Anchor”
- PO’s will be required to get their trainees ready for a turn on the windlass
- Anchor hauled up the rest of the way
- When the anchor comes out of the sediment the bosun will yell “Anchor’s a trip”
- When the anchor leaves the bottom the bosun will yell “Anchor’s aweigh”
 - How can you tell when the anchor has left the bottom?
- When the Bosun sees the anchor they call “Anchor’s in sight”
- And finally “Anchor’s-a-cockabill” when the anchor is up to the hawse pipe

28

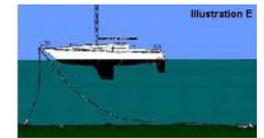
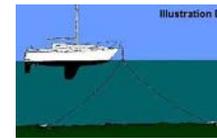
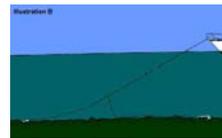
Kedging

- Kedging means using the anchor to move the boat
- Anchor is rigged on a line and the ship's boat is used to move the anchor into position
- Anchor is dropped and is hauled on by the crew on board the vessel.
 - Used to move a vessel when there is no wind
 - Used to manoeuvre a vessel in tight quarters (eg leaving the wall in port)

29

Using Multiple Anchors

- Bow and stern anchor
 - Used in confined anchorages where you don't want to swing at all
- Two bow anchors
 - Used where you have tides

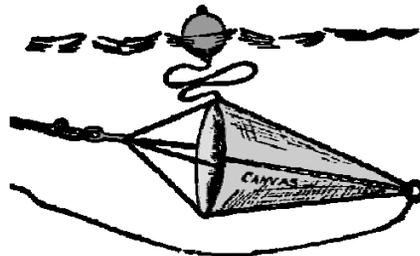


http://www.pangolin.co.nz/fetsam/view_article.php?id=8

30

Sea Anchors

- Used during a storm
- Set from the bow or stern
- Keeps bow or stern into the wind/waves.
- From the stern it slows you as you run from the storm
- What if you don't have a sea anchor?



DROGUE, OR SEA ANCHOR.

<http://freepages.genealogy.rootsweb.ancestry.com/~fassit/kenealy/kenealy2a.html>

31