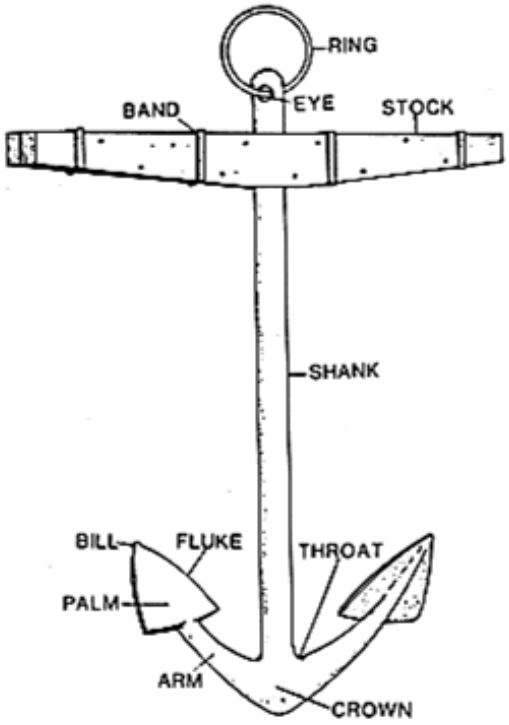
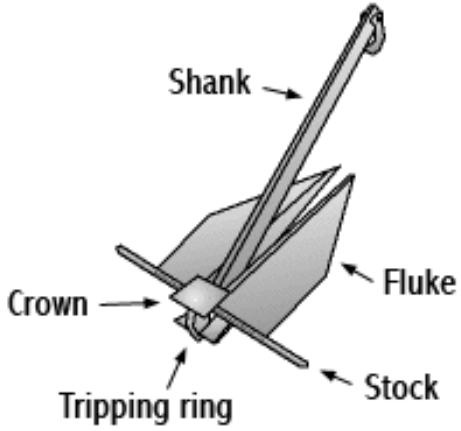
Ground Tackle (Anchors)



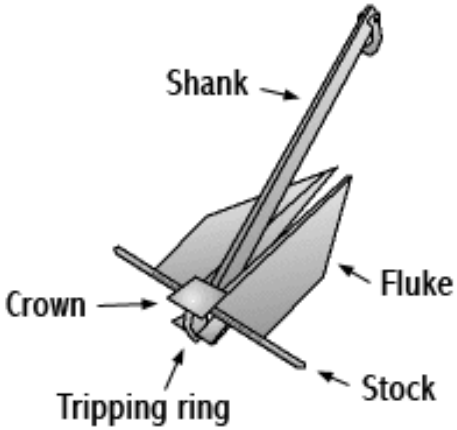


Parts of Anchor

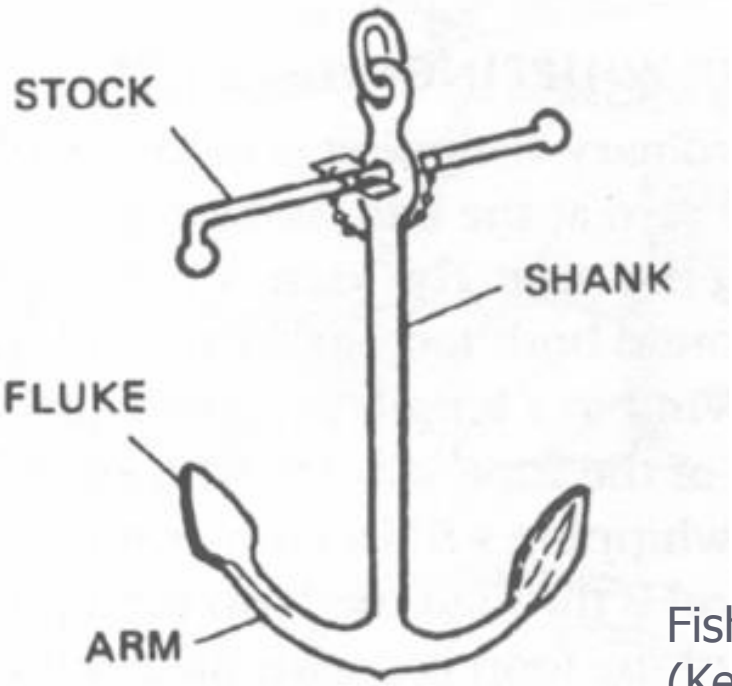
- **Arm-**Part of the anchor extending from the crown end of the shank and connecting to the palm.
- **Band-**Metal loop securing the two sections of the wooden stock together and to the shank.
- **Bill-**Very tip end of palm.
- **Crown-**The pointed end of the anchor which attaches the shank to the arms.
- **Eye-**Hole in the end of the shank through which the ring is attached.
- **Fluke-**The spade shaped appendage of the arm used for digging into the sea bed in order to secure the vessel.
- **Palm-**Flat upper most portion of the fluke.
- **Ring-**The working end of the anchor which rope or chain was attached to connect the anchor to the vessel.
- **Shank-**The vertical stem of the anchor.
- **Stock-**Cross bar of the anchor which turns the anchor into an attitude that enables the fluke to dig in to the sea bed.
- **Throat-**The curvature between the shank and the upward part of the arm.
- **Tripping Ring** –A ring attached to an optional tripping line: by pulling the tripping line, the anchor will break out.

Stocked Anchors

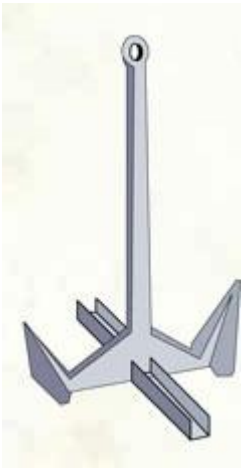
Stock aligns anchor so that flukes can dig into bottom.



Danforth



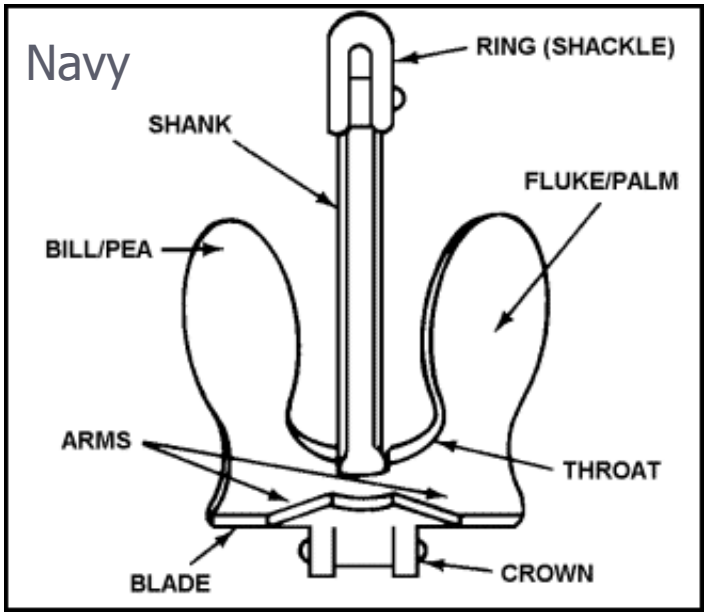
Fisherman's (Kedge)

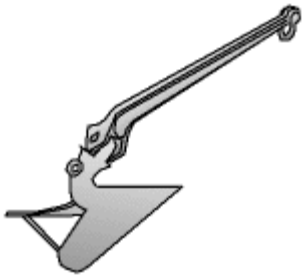


Northhill

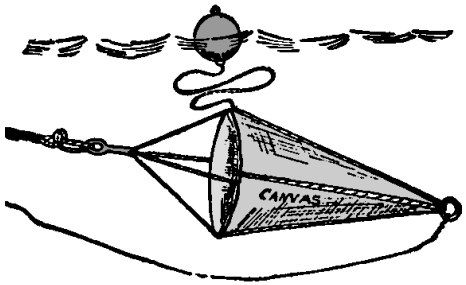
Stockless Anchors

An anchor that is not secured to the rail at the bow of a ship, as stock anchors are, but is pulled up into the hawse pipes until the flukes meet the hull.

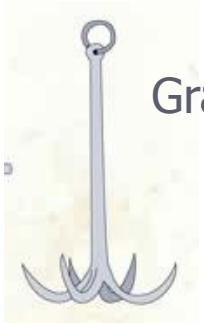




Plow
(CQR)



Sea Anchor
(Drogue)

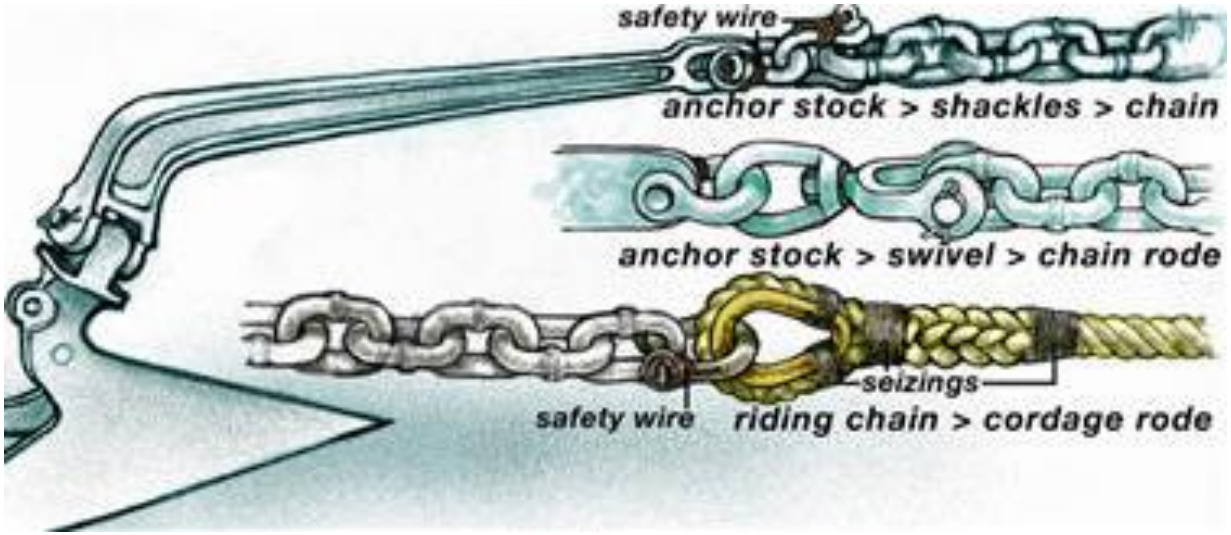


Grapnel

Mushroom

Rode, Chain, and Attachment

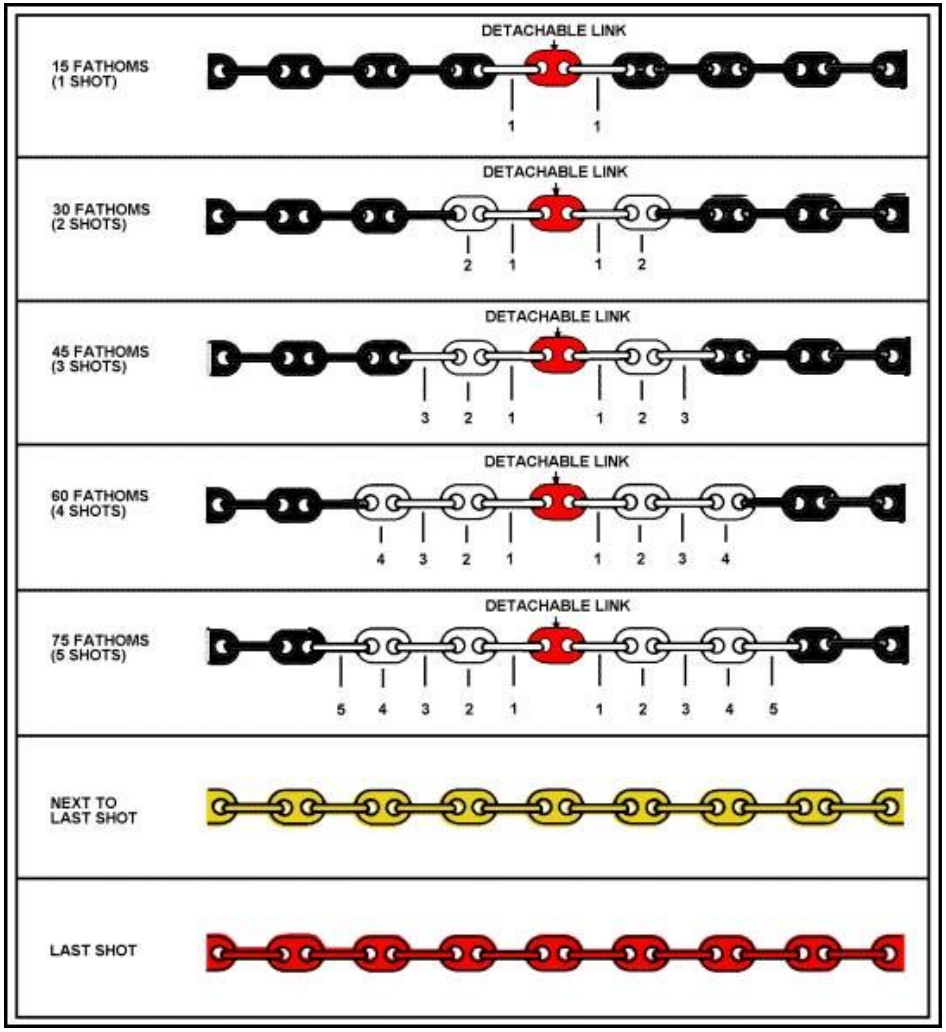
- Shackle
- Line
- Thimble
- Chain
- Safety Wire
- Swivel
- Seizing
- Splice
- Chafe



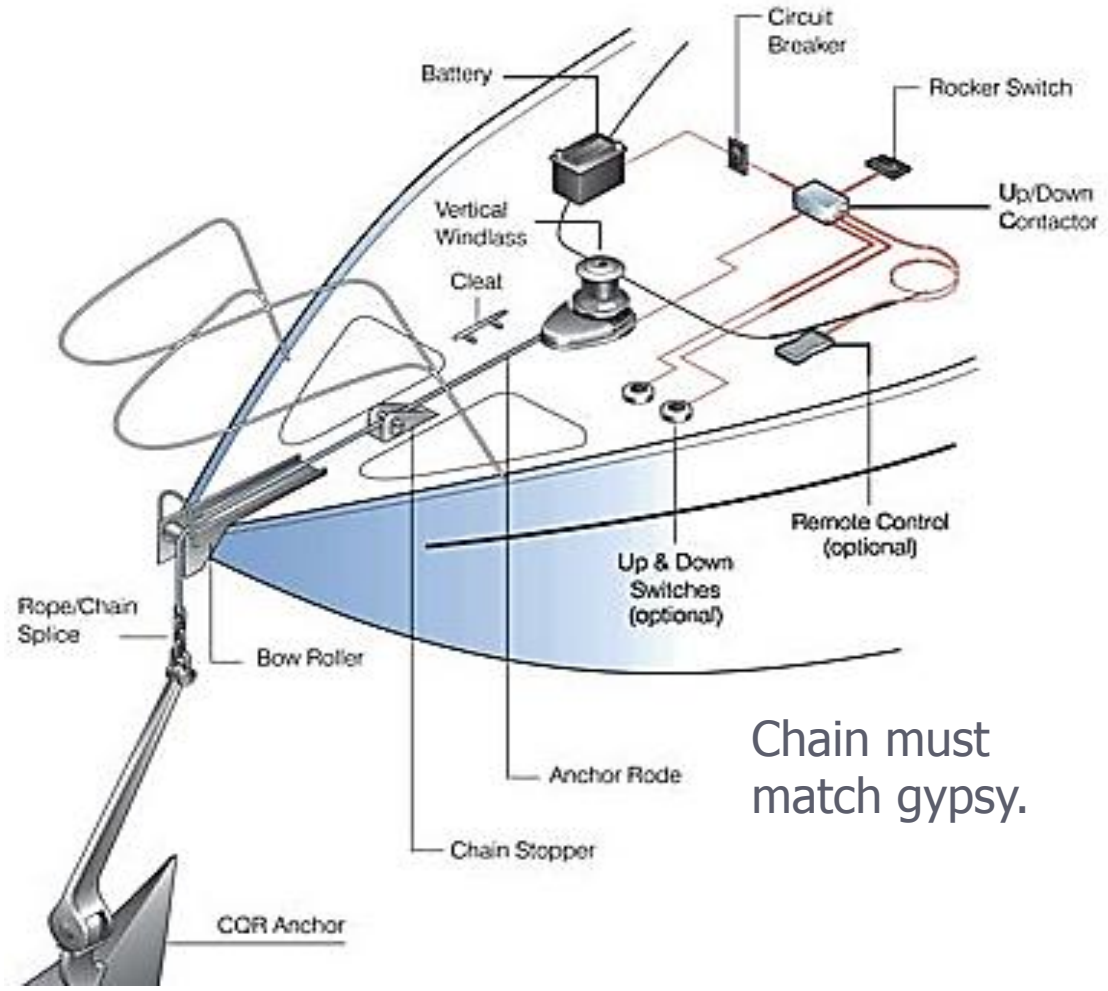
Twisted Nylon line is superior to braided line because it stretches, thereby reducing the forces felt by the cleat.

Safety wire keeps shackle from coming loose.

Marking Anchor Rode

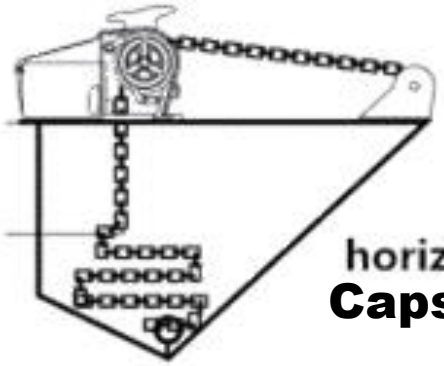


Windlass/Capstan

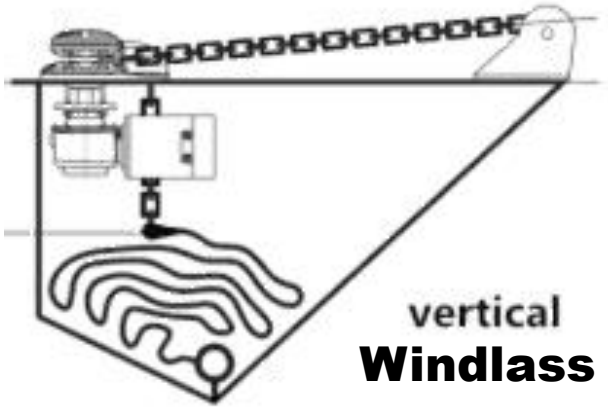


Chain must match gypsy.

Windlass/capstan is a device to handle heavy anchor and rode. Most have electric motors, usually with mechanical backup.

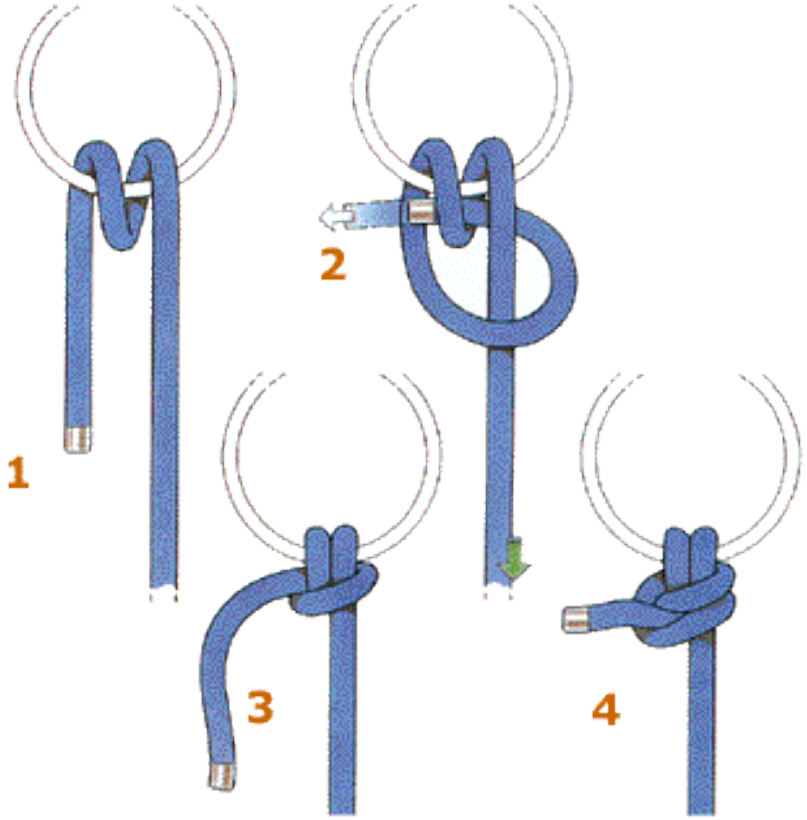


horizontal **Capstan**



vertical **Windlass**

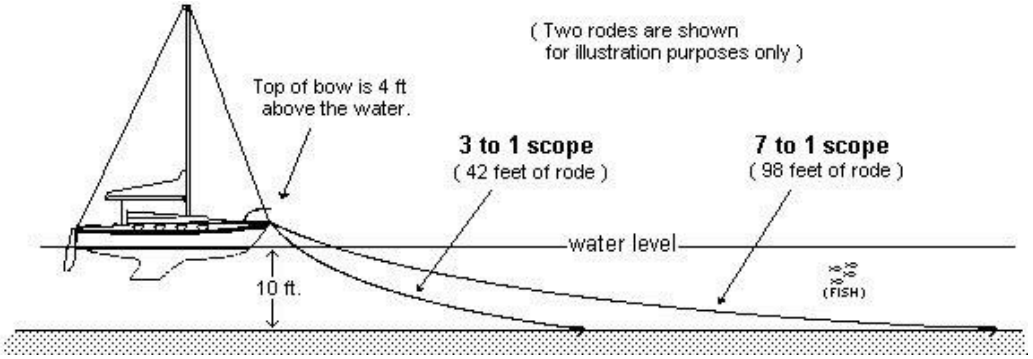
Anchor Hitch

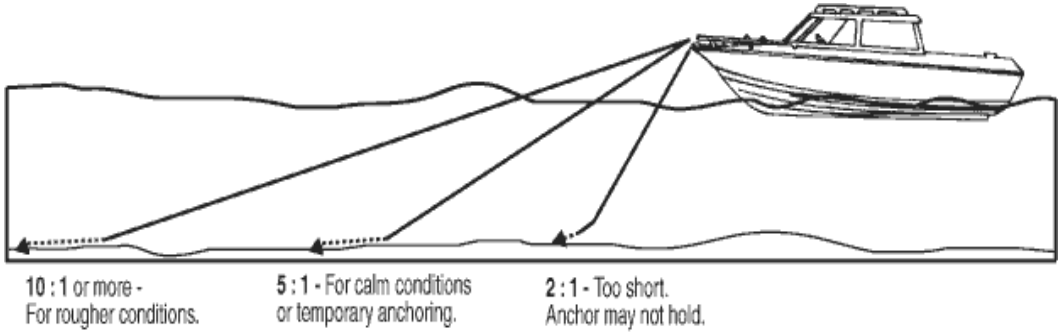


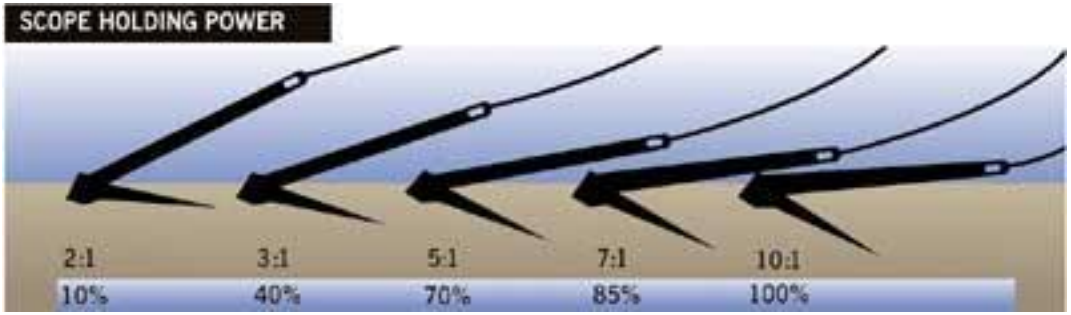
- This knot holds well even when tension on the line is changing, for instance with an anchor.
- Option: Add an extra one or two half hitches or seize the tail to the standing end for additional security.

Scope

- Scope is the ratio of anchor line (rode) length relative to the distance from your boat's deck to the sea bottom.
- Simple formula calculates rode length (L) from scope (S) from depth (D) and freeboard (FB).
- L = S x (D+FB)
- Ex: FB=4, D=10, S=7; L = 7x(10+4) = 96 ft.







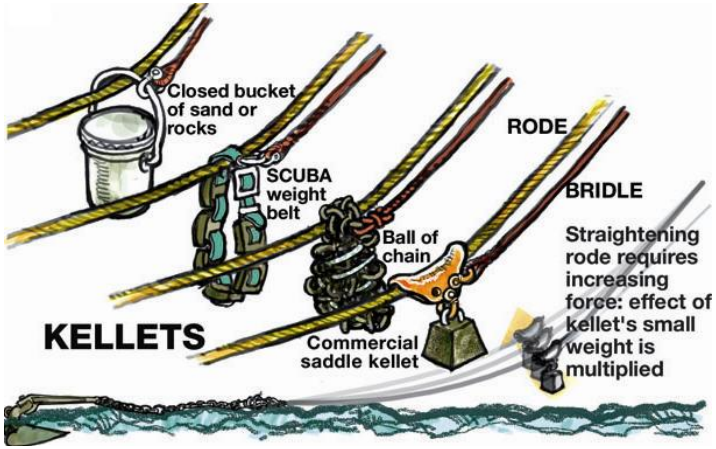

Anchoring Guide

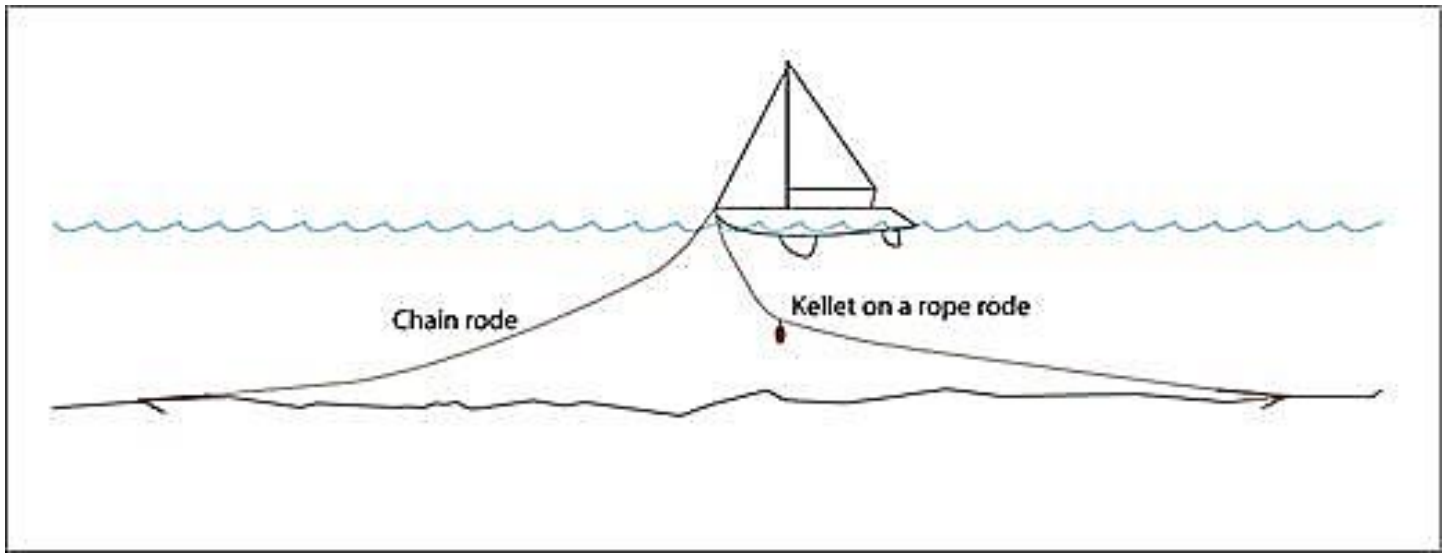
- Proper ground tackle means:
  - Right anchor, adequate chain, braided nylon rode, joined with thimble and shackle
- Determine holding requirements
  - For 25 ft boat, given wind/current:
    - 15 kts 125 lbs horizontal load
    - 30 kts 490 lbs horizontal load
  - As wind doubles, load quadruples
- Use adequate scope
  - Lunch hook – 5:1
  - Overnight – 7:1
- Set anchor watch and/or anchor alarm
  - Take fix when set, after 5 minutes, at each tide cycle

WIND SPEED	BOAT LENGTH in FEET				
	20ft	25ft	30ft	35ft	40ft
15 kts	90	125	175	225	300
30 kts	360	490	700	900	1,200
42 kts	720	980	1,400	1,800	2,400
60 kts	1,440	1,960	2,800	3,600	4,800

Bahamian Mooring

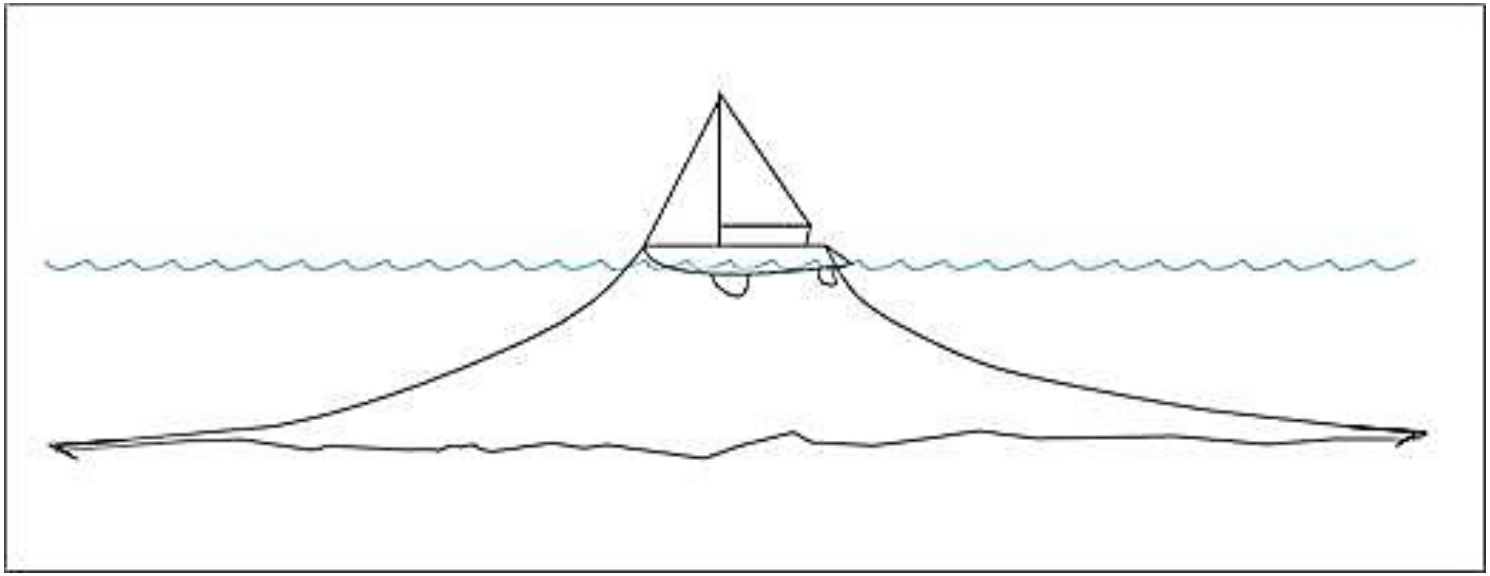
- Good for shifting currents
  - One anchor upstream
  - One anchor downstream
  - Both attached to bow
- Avoid snags on keel
  - Bridle rodes together
  - Kellet to hold rodes below keel





Fore-Aft Mooring

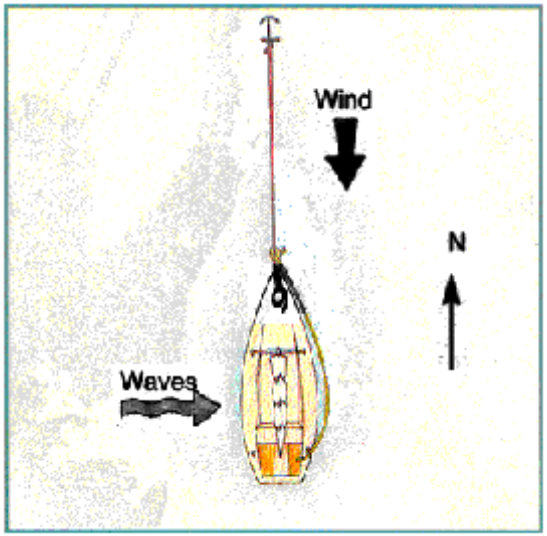
- Good for restricting swing
  - One anchor cleated to bow
  - One anchor cleated to stern
- Only works if other boats are similarly moored



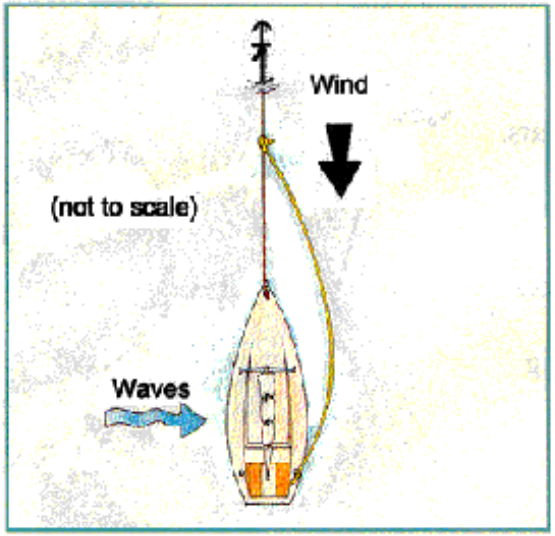
Springing the Rode

- Reduces boat surging when waves are broad

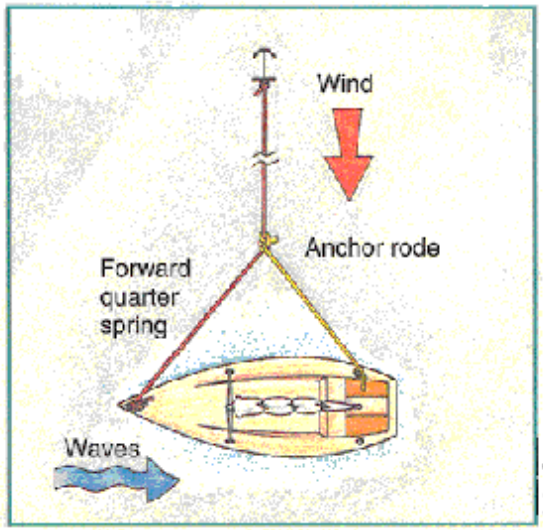
Attach spring line to anchor rode using roving hitch



Pay out additional anchor rode

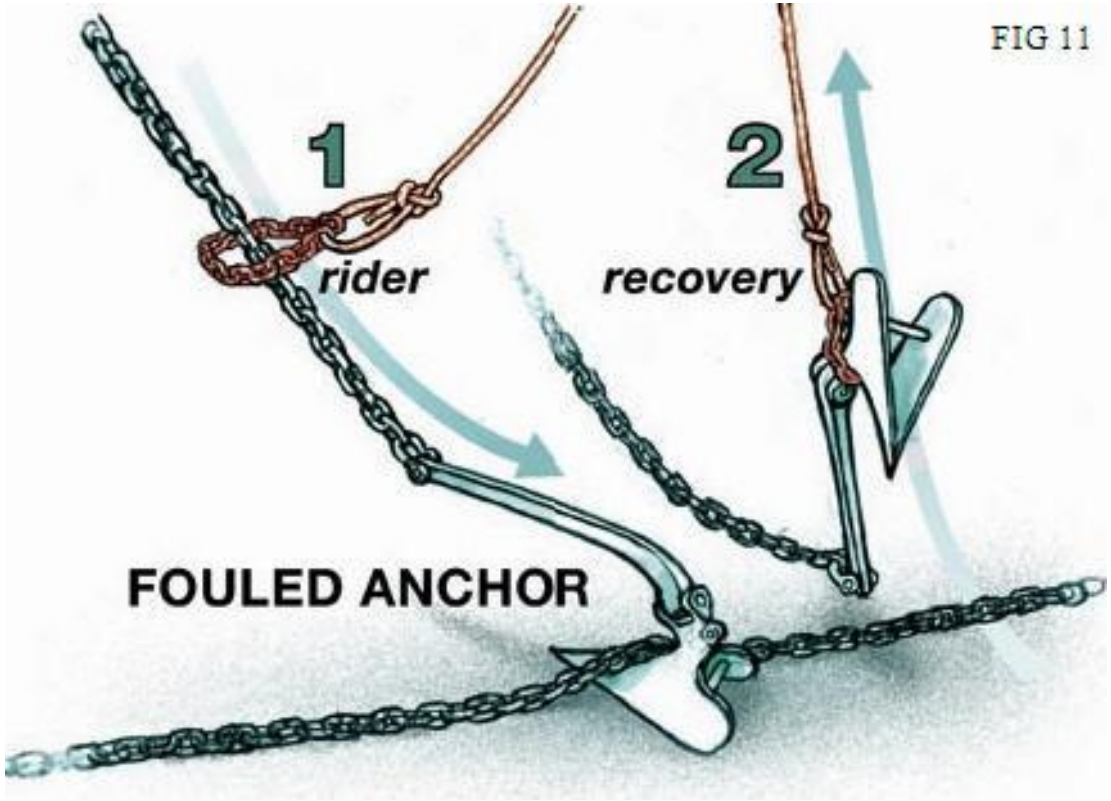


Take up spring line until bow (or stern) faces the wind



Stuck/Fouled Anchor Recovery

Using a rider (or tripping ring) to Unfoul an Anchor

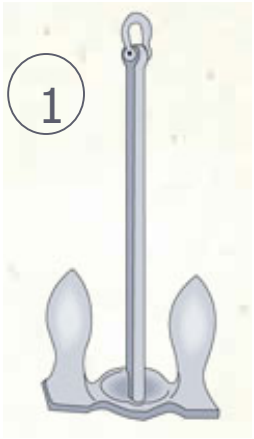


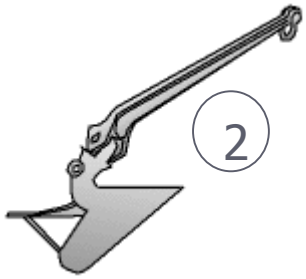

Anchor’s Aweigh

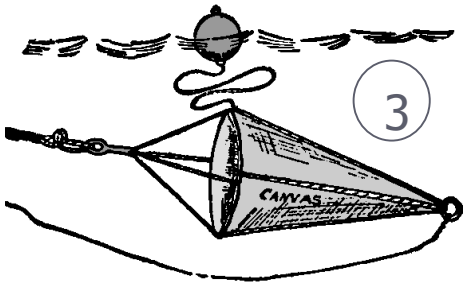
Anchors Aweigh, my boys,
Anchors Aweigh.
Farewell to college joys,
we sail at break of day-ay-ay-ay.
Through our last night on shore,
drink to the foam,
Until we meet once more.
Here's wishing you a happy voyage home.

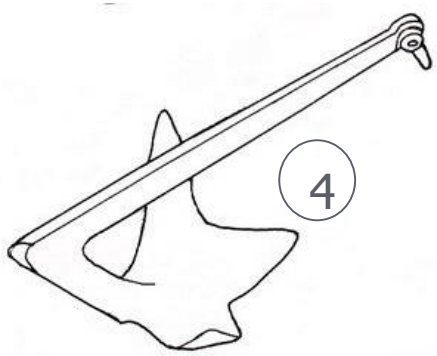
Types of Anchors

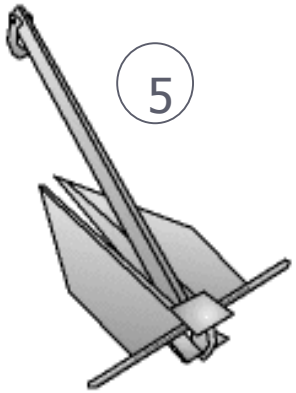
- Kedge
- Navy
- Fluke
- Plow
- Claw
- Grapnel
- Mushroom
- Sea Anchor

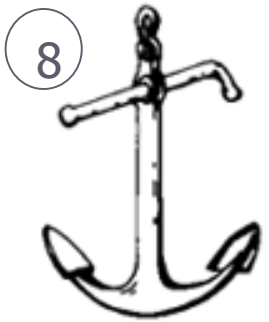






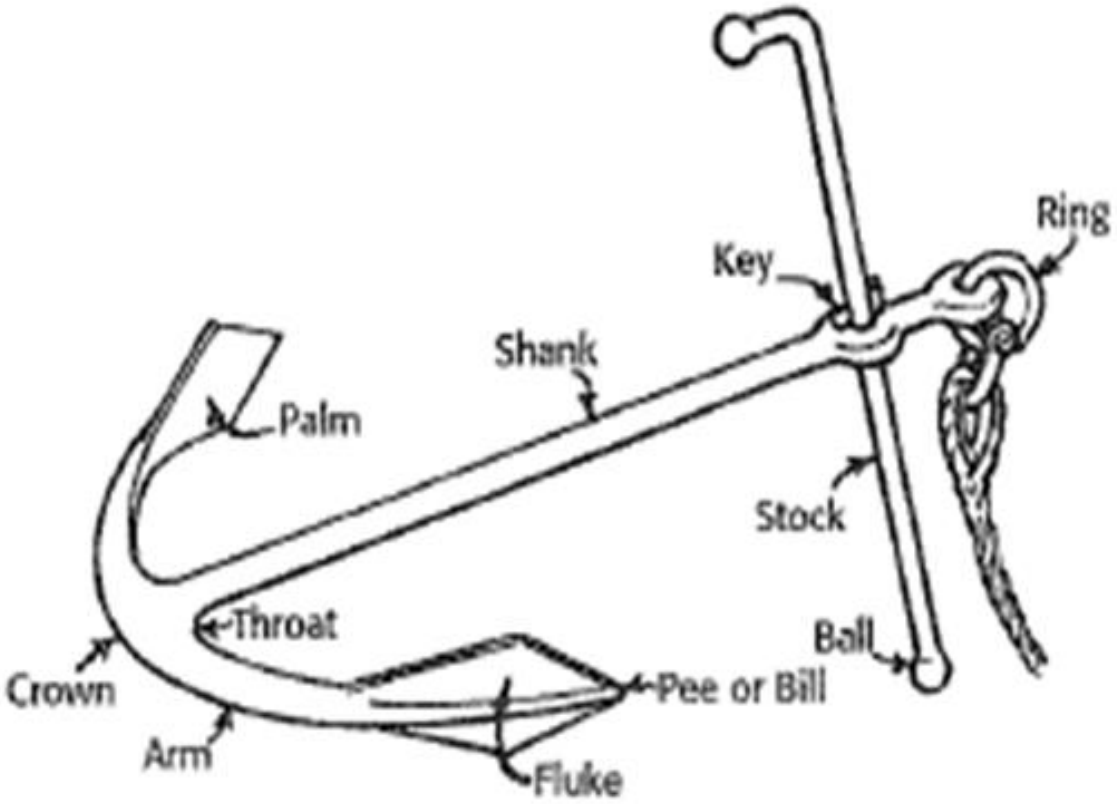






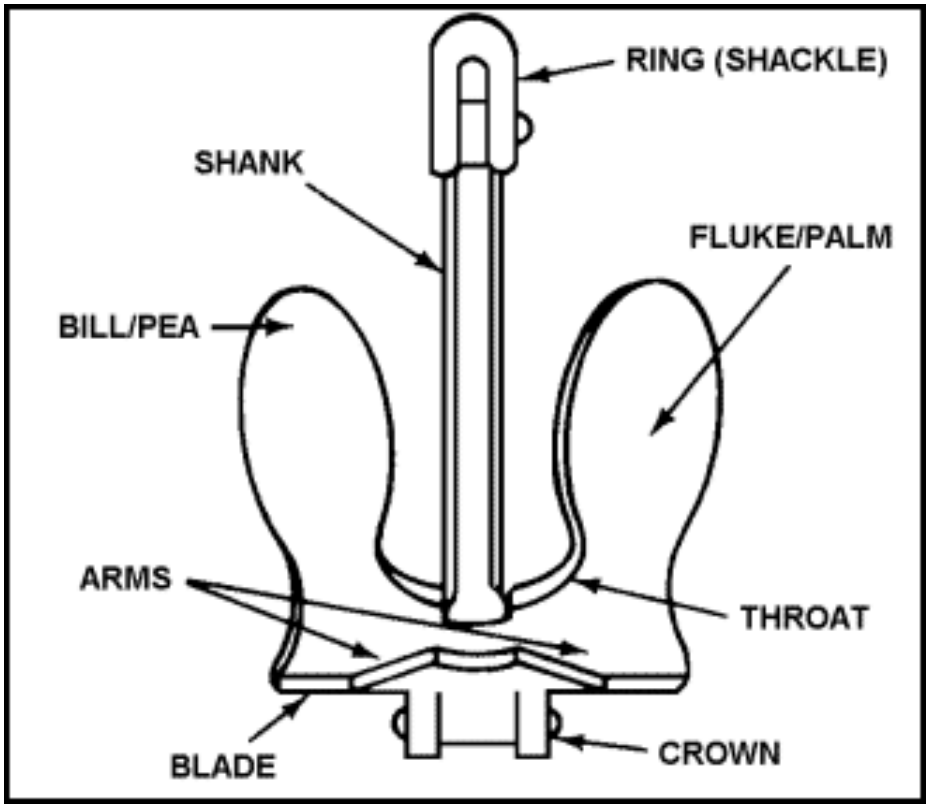
Kedge

- Good for:
  - Rocky bottom
  - Grassy bottom
- Advantage
  - Easily stowed
- Disadvantage
  - Easily fouled
- Also known as:
  - Fisherman
  - Yachtsman



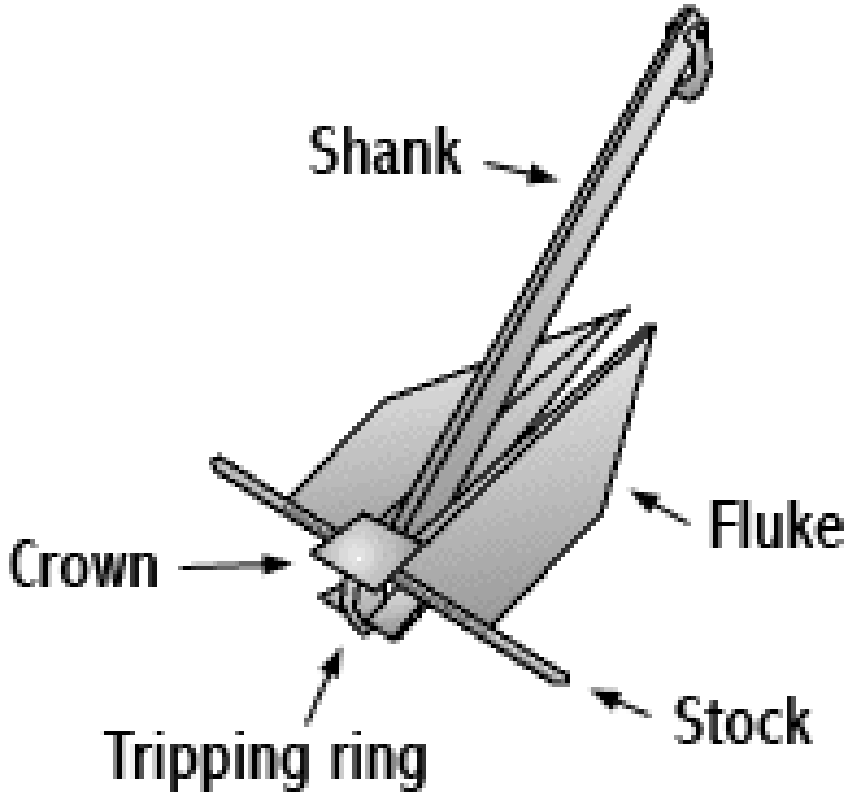
Navy

- Good for:
  - Muddy bottom
  - Grassy bottom
- Advantage
  - Inexpensive
- Disadvantage
  - Very heavy



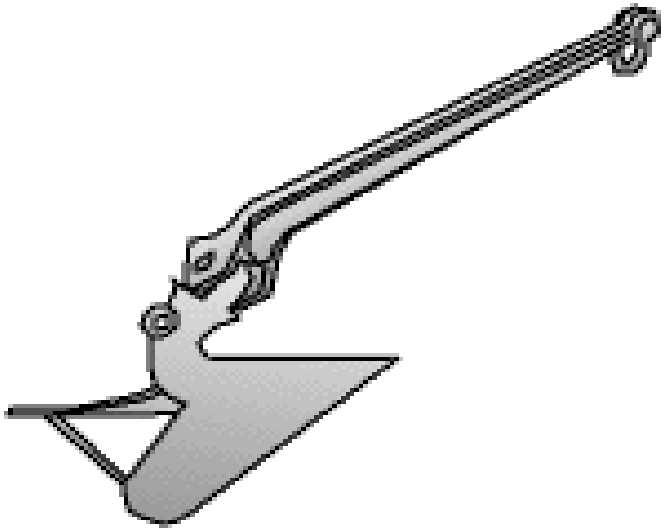
Fluke

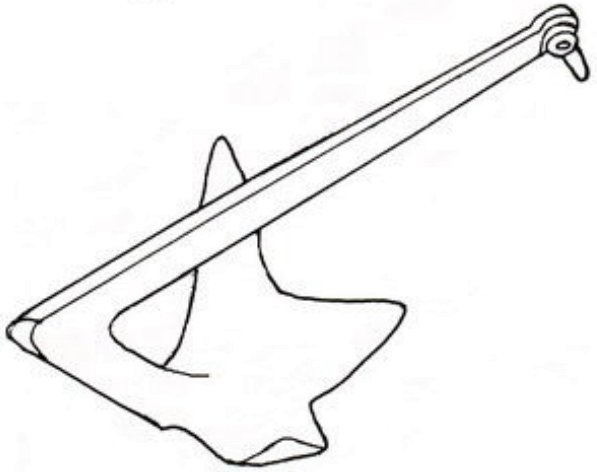
- Good for:
  - Sandy bottom
  - Muddy bottom
- Not good for:
  - Grassy bottom
  - Rocky bottom
  - Hard bottom
- Also known as:
  - Danforth
  - Fortess
  - Northill



Plow/Claw

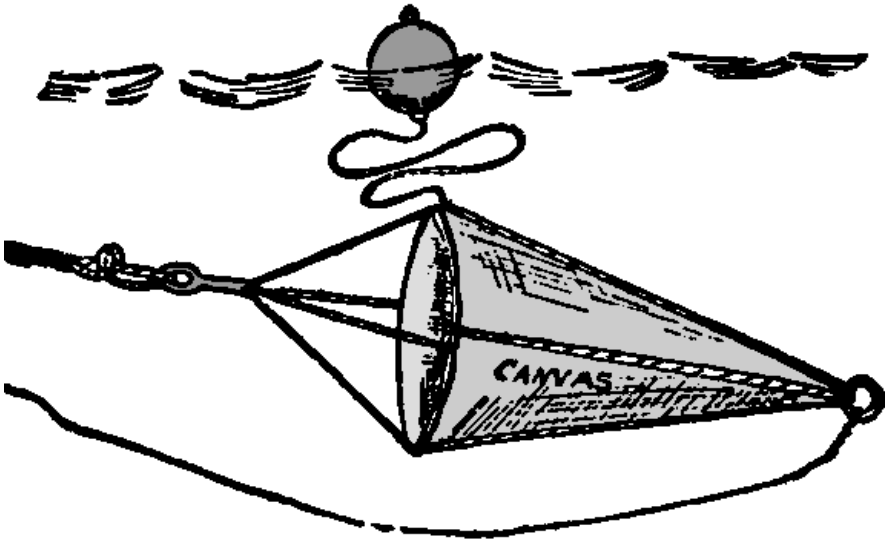
- Good for:
  - All bottoms
- Advantage:
  - Quick setting
  - Does not foul when boat shifts direction
- Disadvantage:
  - Awkward to stow
- Also known as:
  - CQR, Bruce, Delta, Rocna





Sea Anchor

- Good for stabilizing boat in heavy weather
- Keeps bow pointed into wind/waves
- Anchors to the sea, not the sea floor
- Also known as:
  - Drift
  - Sock
  - Drogue



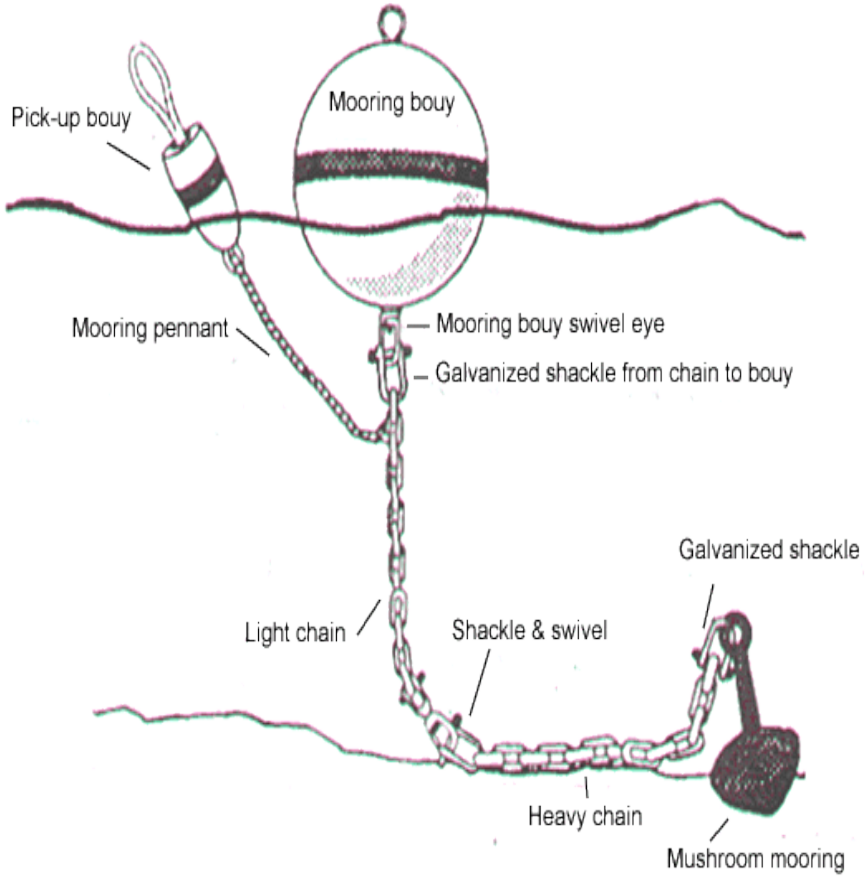
By attaching the sea anchor to a bridle running from bow to stern, the boat can be held at any angle relative to the wind

Anchor Comparison Table

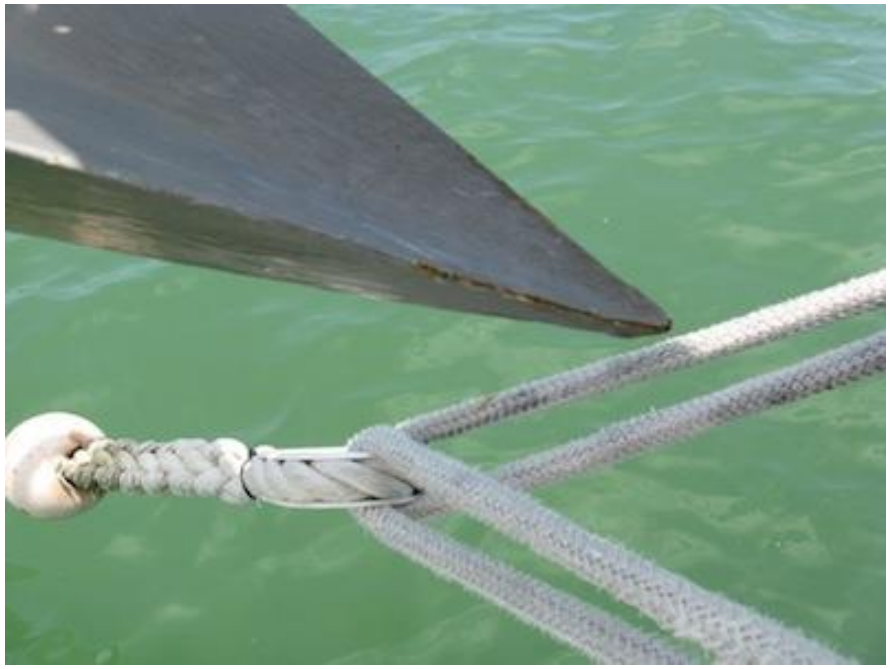
ANCHOR TYPE	Picture	Setting Ability in difficult bottom	Holding in loose soil	Holding in average conditions	Holding in hard soils	Robust
Mantus Anchor		■■■■■	■■■□□	■■■■□	■■■■■	■■■■□
CQR		■□□□□	■■□□□	■■■□□	■□□□□	■■■■■
Danforth		■■□□□	■■■■■	■■■□□	■■□□□	■■□□□
Delta		■■□□□	■■■□□	■■■□□	■■□□□	■■■■□
Manson Supreme		■■■□□	■■■□□	■■■■□	■■■□□	■■■■□
Manson Boss		■■□□□	■■■■□	■■■■□	■■□□□	■■■□□
Fortress		■■■□□	■■■■■	■■■■□	■■■□□	■■■□□
Spade		■■■□□	■■■□□	■■■■□	■■■□□	■■■■□
Rocna		■■■■□	■■■□□	■■■■□	■■■□□	■■■■□
Bruce		■■□□□	■■□□□	■■■□□	■■□□□	■■■■□

Mooring Balls

- Attach a dock line to each bow cleat.
- Aim into the wind, very slowly.
- Grab pendant with boat hook.
- Stop boat when pendant is retrieved.
- Pass port dock line through eye of pendant and back to port cleat.
- Repeat on starboard side.



Tying to Mooring Balls



YES! Notice how there's one line looped through the mooring pennant and back to the same side of the boat and then another on the other side.

NO NO NO! Looping a single line through a mooring pennant causes the line to act like a saw and can saw though not only the line but the pennant itself!

Anchoring Hand Signals

- Setting the anchor
  - Flake rode on deck.
  - Cleat rode at the desired scope before deploying anchor.
- Retrieving the anchor
  - Deck hand should retrieve line while boat is motored toward anchor.
  - Bow watch should point toward the anchor to guide helm.
- If the boat runs over the rode, immediately secure engine to avoid wrapping the prop.

Notes on Anchoring

- Normally anchor from bow where freeboard is greatest.
- Use sufficient scope; at least 7:1.
- Nylon 3-strand rode acts like shock absorber. Use snubber with all-chain rode.
- Don’t use windlass motor to pull boat toward anchor.
- Use hand signals.
- Set electronic anchor alarm at the spot where anchor is dropped, not the end of the rode.
- Practice, practice, practice. One day it might be an emergency.


Quiz

1. The main stem of an anchor is known as a _____.

a. crown, b. shank, c. halyard, d. chain.

2. The _____ are blades that dig into the sea floor to hold the anchor.

a. crowns, b. shackles, c. flukes, d. chains

3. For overnight anchorage, how much rode is needed if the water is 12-feet deep and the distance from the bow chock to the water is 3 feet?

4. Which following anchor is best for overnight anchorage when the bottom is covered in weeds?

a. mushroom, b. drogue c. Danforth d. plow

5. A line can be attached to a _____ to help break out a stuck anchor.

a. tripping ring, b. stock, Northill, d. spring

6. A _____ is used at the end of an anchor rode to add weight and help maintain a horizontal pull on the anchor.

a. transom, b. stock, c. chain, d. fluke

7. A safety wire is can be threaded and tied to hold a _____ together and help keep an anchor from detaching from its rode.

a. shackle, b. thimble, c. tripping ring, d. scope

8. For overnight anchorage, how much rode is needed if the water is 22-feet deep and the distance from the bow chock to the water is 4 feet?

9. When seas are rough, it is advisable to lengthen or shorten the anchor rode?

10. What single anchor is best to prevent un-setting and fouling caused shifting winds and currents?

a. Danforth, b. plow, c. kedge, sea anchor

11. A _____ prevents rope chafe in the eye where the rode attaches to a shackle.

a. ring, b. tiller, c. thimble, d. crown

12. Drifting while at anchor is a dangerous situation that can be prevented by setting _____.

a. sail, b. the jib halyard, c. helm alee, d. an anchor watch

13. The best times to check your anchor is every 5 minutes after setting anchor, when the wind shifts, and when the _____ changes.

a. tide, b. moon, c. sun, d. both b and c

14. Nylon laid or twisted rope is better than braided rope as a rode because _____.

a. it floats, b. it stretches, c. it is tangle free, d. it lasts forever