

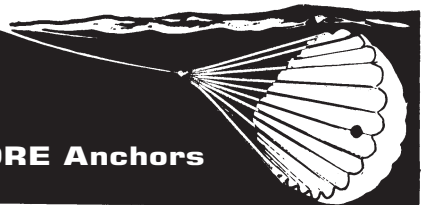


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INSTRUCTIONS FOR USING YOUR PARA-TECH® SEA-ANCHOR



The OFFSHORE Anchors

INSTRUCTIONS FOR USING YOUR PARA-TECH® SEA-ANCHOR

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Printed in the United States of America

“Eternal Father, strong to save, whose arm has
bound the restless wave, O hear us when we
cry to thee, for those in peril on the sea!”

William Whiting

SYNOPSIS AND OVERVIEW:

SAFETY FIRST!

Thank you for purchasing one of our Sea-Anchors. PARA-TECH® Engineering Company is in business to enhance offshore safety. Please do your part to promote, encourage and reward good safety habits on your ship! Set a good example by wearing your own life jacket on board. Practice man overboard drills. Review all safety matters with your crew. Do they know how to find and use the fire extinguishers? Will they be able to use the VHF to summon aid on their own?

NEVER TAKE ANYTHING FOR GRANTED AT SEA

Offshore safety is many things, but first and foremost it is that conservative attitude of mind that never takes anything for granted at sea! In particular, never take your SEA ANCHOR for granted. Remember also that drag devices are mere aids to seamanship and **only as safe as those who use them**. Remember also that different types of boats will react differently to different drag devices. The individual user should take care to determine prior to use that this drag device is suitable, adequate or safe for the use intended. Since individual applications are subject to great variation the manufacturer makes no specific representation or warranty as to the suitability or fitness of the devices for any application. Take note that sea anchors are capable of pulling loads measured in tons, so all lines must be properly coiled beforehand! **Stand clear of the coils as the rope is paying out!**

PAY OUT LOTS OF RODE!

The parachute anchoring system relies heavily on the stretch of the long nylon rode for yielding to the seas (and not standing up against them). Even in moderate conditions you should pay out at least 300' of rode, 10-15x LOA in heavy weather situations.

PARTICIPATE IN THE DRAG DEVICE DATABASE PROGRAM

Our mutual association with offshore safety is an ongoing one. It doesn't end after the sale. The founder of PARA-ANCHORS INTERNATIONAL has instituted a comprehensive program to catalog, preserve and publish accurate information about instances where sea anchors and drogues have been used. If you have occasion to use your drag device, **please fill out and return the DDDB form that was enclosed with it**. An ever growing data resource such as this will-in time-be productive of critical insights into heavy weather tactics and go a long way toward enhancing offshore safety for all mariners. Your feedback, your opinions and your observations, regardless of how insignificant they may seem, are of vital importance to the concept of offshore safety as a whole. Working together we **CAN** prevent tragedies such as Fastnet '79. **We WANT TO HEAR FROM YOU!**

FAIR WINDS & FOLLOWING SEAS!!



Don Whilldin, President
PARA-TECH® Engineering Company



**Wear your
Life
Jacket.**

**It's your friend
for *LIFE*.**

❖ **Watch for this symbol . . .**

it indicates some of the most important items to know.

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Survival!

THE MIND SET

In as much as drag devices are liable to be used in extreme conditions, perhaps we should digress briefly to mention a thing or two about the all important mental aspects of survival also (forewarned is forearmed!). Coast Guard, Navy and Air Force survival experts agree that there is no underestimating the role that the mariner's state of mind plays in his or her survival. **"Attitude is the main thing,"** said Mike Munroe, who survived the 165 knot winds of Hurricane Allen (1980) in a Givens life raft.

While rescuers have marveled at the tenacity demonstrated by some survivors, they have also been perplexed and disturbed by those who seem to capitulate and give up with little struggle, evidently the sheer will to survive having been the major determining factor between life and death itself! **"It's a very hard thing to define, the will to survive,"** said retired Coast Guard search and rescue chief, John Waters (March 1988 issue of SOUNDINGS).

Accordingly, we advise mariners who venture offshore to be always mentally disciplined for survival at sea as the Green Beret is disciplined for survival in combat! To quote the last paragraph of the inquiry on the Fastnet Tragedy of 1979, (**"In the 1979 race, the sea showed that it can be a deadly enemy and that those who go to sea for pleasure must do so in the full knowledge that they may encounter dangers of the highest order"**).

If you are caught in a survival storm, it's **"BATTLE STATIONS"** for everyone. Take charge of the situation and rule your ship with an iron will. Deploy your sea anchor, **pay out lots of stretchy rode so as to yield and not stand up against the seas.** Employ heavy chafe gear. Use a backing sail to keep the bow from swinging excessively from side to side. Batten down the hatches (use hammer and nail if you have to). Jettison all potentially lethal flying objects from the cabin - **THROW THEM OVERBOARD!** Set your house in order and dig in for the battle to survive **COME WHAT MAY.** Establish a strict schedule for keeping watch and getting rest. Appoint a similar discipline for eating. Avoid binging on food and **avoid beverages containing alcohol** (the poison that weakens the will). **KEEP BUSY.** Man the pumps. Repair damage as best as you can, stay sober, post watch, pray, and never **-NEVER-** give up. Enforce a positive attitude, avoid despair like the plague, and don't allow doubt and resignation to set into your crew. Not even for one second.

STAYING WITH THE BOAT

STAY WITH THE BOAT, until there is not one iota of a doubt in your mind that she is in fact going to sink. Remember Fastnet '79?? In that tragic race, twenty four yachts were prematurely abandoned by their crews, which climbed into rubber life rafts believing that their vessels were about to sink. Astonishingly, however, **ONLY FOUR OF THOSE YACHTS WERE ACTUALLY SUNK BY THE FREAK STORM,** and whilst many souls perished in those rubber life rafts, (some of which split apart at the seams) **NINETEEN** of those empty, abandoned boats were found to be intact and still floating, **AFTER** the storm had passed on. . .

COMPONENT RECOMMENDATIONS

(See illustrations center of Booklet)

The following components are needed to properly rig a PARA-TECH® Sea Anchor:

- | | | |
|-------------------|-------------------|--------------------|
| 1. Anchor Rope | 2. Swivel Shackle | 3. Float (Primary) |
| 4. Recovery Float | 5. Trip Line | 6. Anchor Chain |

ANCHOR ROPE

The proper type, size and length of rode will make the difference between a comfortable, safe ride and a harsh, possibly damaging ride.

Type: NYLON is the only rope which should be used with PARA-TECH® Sea Anchors. This is due to its natural elasticity (stretch).

Double braid rope should be 25% to 50% longer than twisted rope.

Size: Rope size should be at least suitable for ground anchoring. The following are general guidelines;

Sea Anchor Size	Boat Displacement	Rope Size
6'	4,000# or less	3/8"
9'	8,000# or less	3/8" - 1/2"
12'	12,000# or less	1/2"
15'	12 to 25,000#	5/8"
18'	25 to 40,000#	5/8" - 3/4"
24'	35 to 50,000#	3/4"
24'	45 to 65,000#	3/4" - 7/8"
24'	65 to 95,000#	7/8" - 1"
32'	80 to 150,000#	1" - 1 1/8"
32'	150 to 200,000#	1 1/8" - 1 1/4"
40'	200 to 300,000#	1 3/4" - 2"

Length: 10 to 15 times the LOA (a MINIMUM of 300') is recommended. Rope ends should be spliced to heavy duty, deep cup thimbles and properly seized in place.

SWIVELS

We recommend using Stainless Steel swivels with PARA-TECH® Sea Anchors:

Sea Anchor	Swivel	Sea Anchor	Swivel	Sea Anchor	Swivel
6' & 9'	3/8"	12'	1/2"	15'	5/8"
18'	5/8"	24'	5/8" or 3/4"	32'	7/8"
40'	1"				

FLOATS

Recommendations are for the Primary float, attached to the end of the Sea Anchor Float Line. Buoyancy is to support the entire weight of the Sea Anchor, rope, chain, etc. if the rope was released and allowed to sink. We suggest using fender floats for the primary float as you already have them. The Trip Line float only needs to float and be visible.

The Primary Float **MUST** always be used as it controls the maximum depth the Sea Anchor can go.

Sea Anchor	Float Buoyancy	Sea Anchor	Float Buoyancy
6' & 9'	18 Lbs.	12' & 15'	60 Lbs.
18' & 24'	125 Lbs.	32' & 40'	350 Lbs.

FENDERS / FLOATS

BUOYANCIES

Cylindrical (Hole through Middle)		Balls (Tear Drop shape)	
Size	Buoyancy	Diameter	Buoyancy
6" Dia. X 15"	15 Lbs.	11"	29 Lbs.
8" Dia. X 20"	37 Lbs.	15"	68 Lbs.
10" Dia. X 26"	77 Lbs.	18"	121 Lbs.
12" Dia. X 34"	145 Lbs.	21"	187 Lbs.
		27"	396 Lbs

TRIP LINE

The trip line should be polypropylene due to its buoyancy. 1/4" to 3/8" diameter, braided is recommended as it handles easier than twisted and is less prone to kinking and tangling.

Length - The trip line may be from 20' to all the way back to the boat (full trip line). A full trip line is not recommended in heavy weather due to the possibility of its fouling and accidentally tripping the Sea Anchor. A good length to work with is 50 to 100'. In moderate conditions where an accidentally tripped Sea Anchor would not put the boat at risk a full trip line may be used.

The trip line is placed between the Primary Float and the Trip Line Float and is used to trip (collapse) and recover the Sea Anchor.

CHAIN

BBB/P.C. Galvanized chain is recommended and can be placed at any point between the Sea Anchor and the boat. Stainless steel or Hi-Test chain of equal strength may also be used.

If the boat uses chain for its ground tackle then the best method is to attach the Sea Anchor rode to the end of the anchor chain (with the anchor REMOVED) and let out from 10 to 150 feet of chain. Make sure the chain is snubbed to deck cleats with snubbers to off load the windlass. The chain should be no more than 20% of the overall scope of the rode. Using chain to lead off the boat eliminates the worry about chafe.

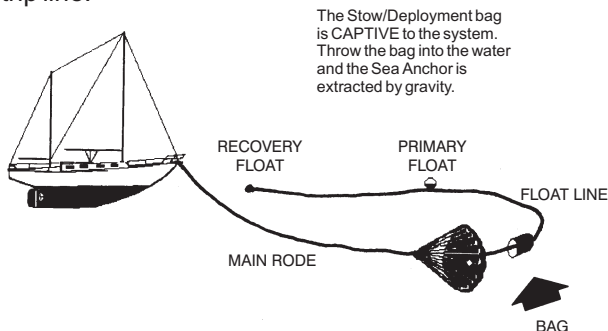
NOTE: The anchor MUST be removed or a short length of chain used as a stand off so the anchor flukes cannot come in contact with the rode. The anchor flukes WILL cut the rode if they contact the rode.

Suggested MINIMUM chain:

Sea Anchor	Chain size	Sea Anchor	Chain size	Sea Anchor	Chain size
6' & 9'	1/4"	12'	5/16"	15' & 18'	3/8"
24'	7/16"	32'	1/2"	40'	3/4"

ASSEMBLY

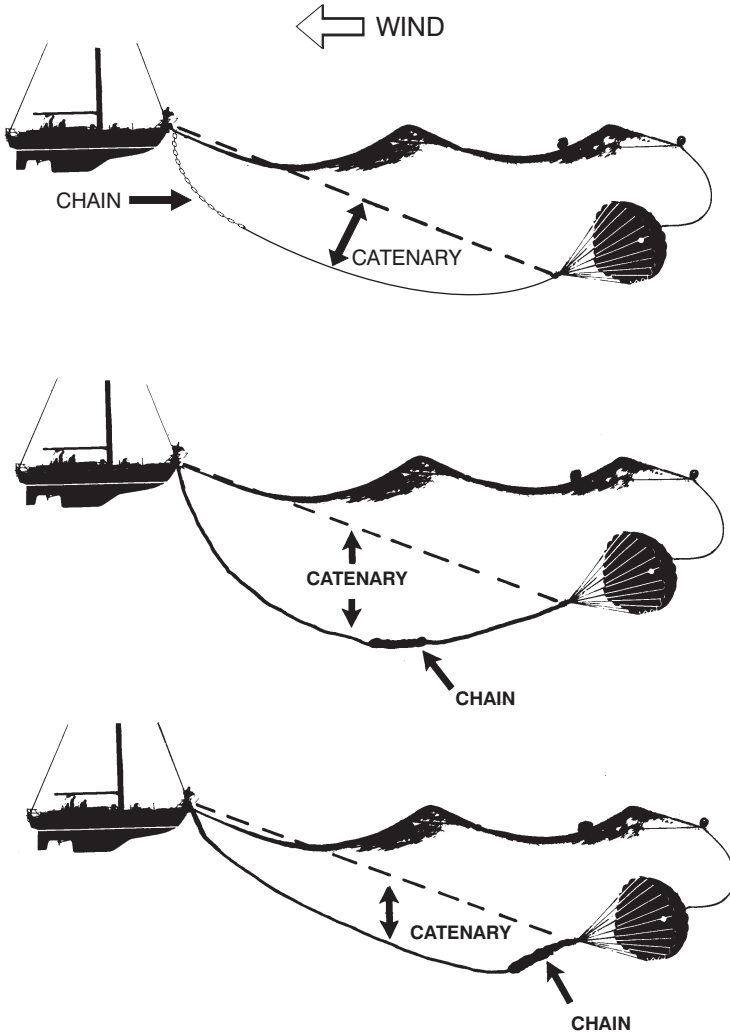
- A. FLOAT LINE:** The float line (included with your PARA-TECH® Sea Anchor) is threaded through a large grommet in the bottom of the deployment bag. This keeps the bag captive to the system. On 12' and larger Sea Anchors there is a small swivel attached to the end of the float line. Attach your primary float to the free end of this swivel. The float line is stowed in the 'roo pouch in the bottom of the bag.
- B. TRIP LINE:** The trip line is attached to the same side of the swivel as the float line. On 6 & 9' Sea Anchors the trip line, float line and primary float are all joined at the same point. Attach the recovery float to the other end of the trip line.



CATENARY

The use of catenary may aid ride comfort. Catenary is the inclusion of weight in the rode somewhere between the Sea Anchor and boat intended to create some sag in the rode where there is a slack cycle in the wind and/or wave motion. IN THEORY as the motion (energy) from a passing wave passes by it will lift and push the boat away from the Sea Anchor. As this occurs the sag in the rode is pulled towards a straight line helping the boat yield to the sea.

The following illustrations show various ways that catenary may be built into the system:



Note: Use of an all chain rode is not recommended.

SEGMENTED RODE:

Voyagers passing through the Panama Canal must have handling lines in order to pass through the locks. These lines can be made with thimbles in each end, and may be used for the Sea Anchor rode thus giving the user many options in length and configuration.



A SPECIAL NOTE REGARDING CHAFE



One of the most important points which **MUST** not be overlooked is the area where the rode rubs against the boat, usually the bow eye which the rode will pass through. The constant movement of the boat will cause the rode to rub (Chafe) against anything in this area. Special care **MUST** be taken to transfer this wear to something (leather pads, hose, for example) which will wear instead of the rode.

Once the Sea Anchor is deployed you **MUST** employ chafe gear where the rode rubs against the boat. The more severe the conditions the more important the chafe gear is.

Failure to use proper chafe gear **WILL EVENTUALLY LEAD TO THE FAILURE OF THE RODE AND THE POSSIBLE LOSS OF YOUR VESSEL AND CREW.**

While at Sea Anchor you should regularly monitor the condition of the rode where chafe is possible. If chafe is occurring either employ more chafe gear or freshen the nip (let out a bit of line to shift the wear point). **ALWAYS MAINTAIN A WATCH!**

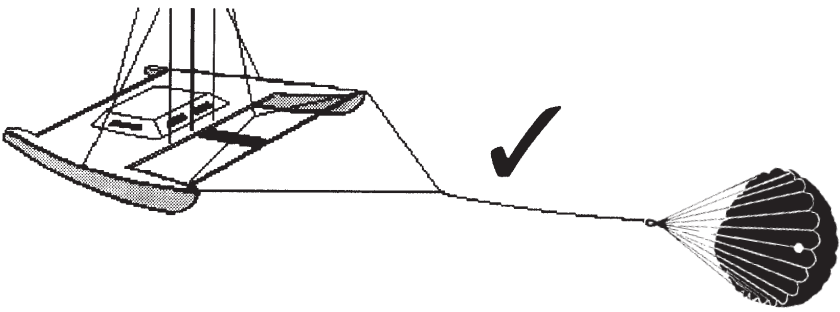
❖ MULTIHULLS:

A bridle to the OUTER HULLS must always be used on multihulls. Each leg should be approximately 2½ times the beam of the boat. Thimbles should be spliced in at least one end of each leg and attached SEPARATELY (use 2 shackles, one for each leg) to the main rode. The boat ends may be secured to cleats (with backing plates) or run through snatch blocks to cockpit winches and adjusted for the most comfortable ride.

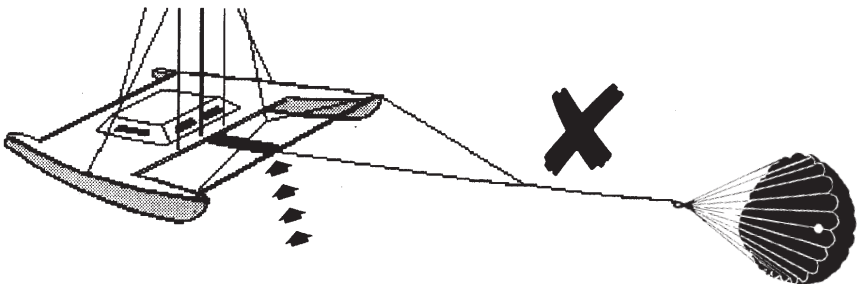
WARNING ❖ WARNING ❖ WARNING ❖ WARNING ❖ WARNING

Some catamarans have a centrally located anchor roller situated midbeam on the weakest part of the boat - the aluminum crossbar that supports the trampoline. On these boats leading a line there **MUST NOT BE DONE**. It is not braced like a mast and attaching to it can lead to failure of the crossbar, capsize and loss of life. Attach the bridle legs **ONLY** to the hulls on catamarans.

CORRECT BRIDLE SET UP



DANGEROUS BRIDLE SET UP



CAUTION: COASTAL CURRENTS

Large diameter sea anchors are very powerful devices in so far as checking wind drift is concerned. For this reason we advise mariners to be aware when sea anchored in the vicinity of strong coastal currents. We do not offer this advice in a dogmatic sense however, and are merely saying that FOREWARNED IS FOREARMED! Because water is some 800 times heavier than air, if you deploy your Sea Anchor in a strong current, it will pull the boat with the current, regardless of wind direction and intensity. There is a recorded case of a 60 ft. catamaran being pulled directly up wind by a 3 knot coastal current -- in Force 9 conditions! Maintain a constant watch when hove to a Sea Anchor in areas of strong coastal currents.

SHIPPING LANES

Don't court disaster by deploying your Sea Anchor in the shipping lanes! Most ships are on very tight and expensive schedules, and we sailors would do well to discard our preconceived notions about the "benevolent" nature of ships at sea. Reflect on this: A few years ago a tanker pulled into an Alaskan port, and there, dangling from its starboard anchor was the remains of a sailboat mast and rigging...

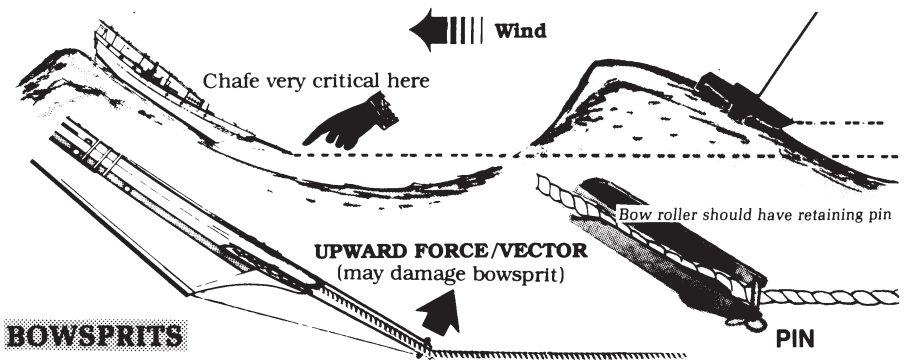
REMEMBER: Our chances of collision increase by geometric progression when we get into the narrow shipping lanes. Naval ships not withstanding, most of the faster traffic will keep to the GREAT CIRCLE ROUTES to conserve fuel. Those great circle routes are plainly marked on PILOT CHARTS. Transcribe them onto your full sized charts and go to a state of alert when you enter any shipping lane. Always have anchor lights on at night when set on your Sea Anchor.



BOWSPRITS

Bowsprits have always been a nuisance of sorts at anchor, and more so at sea anchor, where the bow is often pointing sharply down into a trough, whilst the rode is leading up and out toward the sea anchor. In this connection, some sailors have improvised various bridles, with various degrees of success. If your bob-stay fitting (at the waterline) is hefty enough, for instance, you can lead the rode to it. Or, if the bowsprit itself is hefty enough, you can lead the rode to its tip (more leverage, and the boat will behave much better at sea anchor). Or as some sailors have done, you can try a bridle, about 12 ft. or so in length, leading from both the waterline and the bowsprit, to which the rode can be attached. Experiment with different ideas until you reach a proper compromise for your particular boat.

ALL BOW ROLLERS MUST HAVE RETAINING PINS TO KEEP THE RODE FROM SLIPPING OUT



WIND VANES

Don't put out to sea without a good wind vane. In a very real sense, THIS is the addition that makes crossing oceans in a small boat acceptable nowadays, otherwise "adventure" may become an altogether insufferable ordeal! Servo-pendulum gears such as ARIES, MONITOR, NAVIK and FLEMING come highly recommended. On these, the vulnerable pendulum and vane can be quickly removed at sea anchor, leaving nothing exposed to the whims of the sea, other than a small bracket on the transom.

If your boat is equipped with a different type of a vane, (one with an auxiliary rudder permanently in the water), you should take steps to secure the unit. Consider installing pad-eyes, for instance, so that the vane's rudder can be secured amidships at sea anchor. A wind vane is a very valuable tool at sea-and so is a sea anchor! See to it that they compliment—and not contradict—one another!

NOTE: In extreme weather conditions you will be in "confused seas" where the phase will be constantly changing. You cannot be constantly adjusting the rode length for these changes which is the reason for the minimum 300' as well as 10 times the LOA of the boat.

In moderate conditions a shorter rode can be used provided you are "in phase".

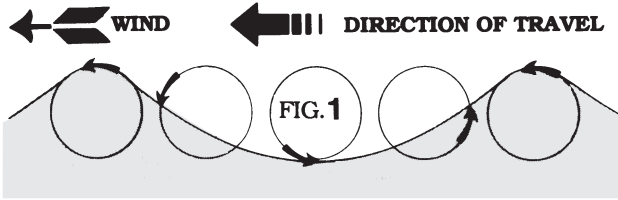


CAUTION



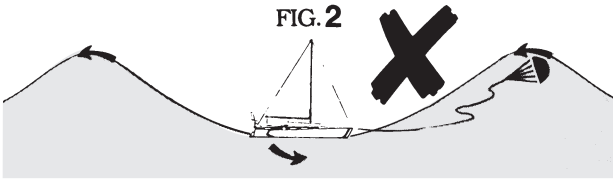
HAZARDS OF WAVE PARTICLE ROTATION

(Trip-line and float not shown. Illustrations are not to true scale).



TROCHOIDAL WAVE THEORY, (from the Greek "TROCHOS" meaning "WHEEL"). The diameter of the "wheel" is equal to the height of the wave. The period of the wave determines the time it takes for the wheel to make one revolution. The approximate rate at which the water molecules rotate at their orbital (surface) velocity can be determined by dividing the circumference of the wheel by the wave period.

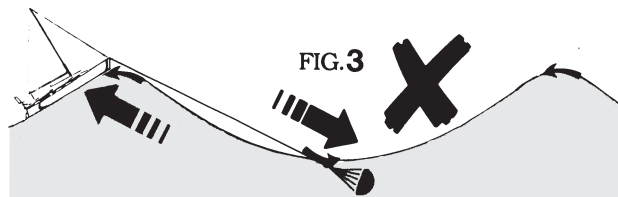
CAUTION!



CAUTION!

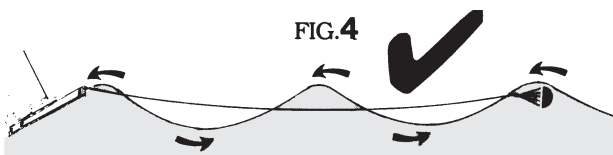
INCORRECT RODE LENGTH (TOO SHORT): Molecular rotation upwind in the trough and the corresponding rotation downwind on the crest cause the boat and the parachute to momentarily converge.

CAUTION!



CAUTION!

INCORRECT RODE LENGTH (TOO SHORT): Molecular rotation downwind on the crest and the corresponding rotation upwind in the trough cause the boat and the parachute to momentarily diverge (move apart). Note also how the inadequate rode length causes the sea anchor to interfere with buoyancy of the yacht as well, **ALL IN ALL A POTENTIALLY DISASTROUS SCENARIO.**



CORRECT RODE LENGTH: The long rode leaves the boat free to rise/move/rotate with the seas, and by stretching acts as a "buffer" to absorb much of the peak divergence loads; notice how the rode has been finely adjusted so that the boat and the sea anchor are rotating in unison on their respective waves.

(Note: For the actual speed of molecular orbital motion as it relates to sea anchoring, see Shewmon paper entitled "SEA ANCHOR-RODE FACTS")

THE COMMANDMENTS OF PARACHUTE SEA ANCHORING

1. Heavy duty cleats (through bolted with backing plates) shall be used with the parachute anchoring system.
2. All lines shall be spliced to heavy duty thimbles and all shackles shall be safety-wired.
3. Heavy duty bow rollers with securing pins shall be used on single hulled boats.
4. Heavy duty chafe gear shall be employed where the rode meets the boat.
5. All lines shall be properly coiled prior to deployment - **NEVER TAKE ANY SEA ANCHOR FOR GRANTED!**
6. The sea anchor rode shall be **NYLON**, with adequate stretch to negotiate shock forces. Rode diameter should be at least the same as used for ground tackle.
7. **ADEQUATE "SCOPE" MUST BE PAYED OUT TO PRESERVE VESSEL BUOYANCY AND TO MINIMIZE SHOCK FORCES**, the rule being as follows: **THE GREATER THE SCOPE, THE LESS THE STRAIN ON EVERYTHING CONCERNED.** For storm applications, this "scope" is suggested to be about 10 times the LOA of the boat. In other words, a 30 ft. boat should pay out at east 300 ft of line.
8. A swivel of adequate size and type shall be used at the sea anchor terminal to allow for line de-torque and parachute free-wheel.
9. A trip-line shall be incorporated into the system to avoid the hazards of wave rotation during retrieval.
10. Mariners shall observe all the traditional rules of safety during and after deployment, wearing a safety harness, posting watch etc.
11. **DO NOT BE LULLED INTO A FALSE SENSE OF SECURITY . . . King Neptune may be throwing everything at you . . . STAY ALERT AND BE PREPARED FOR THE WORST!**



WHEN TO SET THE CHUTE

Monitor WWV (shortwave band, 2.5, 5, 10, 15 and 20 megahertz, 8 minutes after the hour, and 48 minutes after the hour), and local weather frequencies. Look for your own weather signs and watch the barometer. **DON'T WAIT UNTIL THE LAST MINUTE!!!** A rapidly falling barometer means that you are being overtaken by an atmospheric vacuum of sorts. Where there is a vacuum, air rushes in to stabilize the system, and rushing air means high winds and mature seas! Pay attention to your barometer — and don't put out to sea without one!

TRANSITION FROM OFFENSE TO DEFENSE

The exact time of transition from **OFFENSE** to **DEFENSE** will vary from boat to boat and crew to crew. Nevertheless some pointers are offered here: If, for instance, sea anchor deployment is imminent, **always have that the chute in the water and properly set WELL BEFORE DARK!**

By all means go WITH Mother Nature when practical, but remember that going with Mother Nature and trying to KEEP UP with Mother Nature are two different things. Remember again that the human mind is fragile and unless it can periodically regenerate itself at sea (ease and relax the force of its tension) it will grow weak and ineffective. **Exhaustion, resignation, and the attendant wrong decisions have been preludes to tragedies at sea.** Before "Mother Nature" begins to overtake and overwhelm you, before physical and mental fatigue sweeps over you like a black cloud, before you find yourself railing uncontrollably at the wind and the sea, that's the time to think about deploying your sea anchor and calling time out.

CRUISING PHILOSOPHY AND SAFETY

Here's some sensible advice from one of our customers, who deployed a 28' diameter para-anchor during an Atlantic storm (monohull steel schooner, 75' x 36 tons, full keel, Force 9-10 conditions, Latitude 39° 40' North, Longitude 49° 30' West): **"People must realize that ocean cruising can be safe if you go with the idea that you will go into a defensive position before the seas build too high. The flat out philosophy of professional racers must be disregarded by small crew cruising yachts."** (Jeremiah Nixon, yacht "Goodjump II")

DAMAGE CONTROL: THINK FIRST, ACT SECOND

Sooner or later all mariners will taste panic at sea, it's normal, and we advise mariners to remember that the sea anchor is there to be used! In case of stove-in hull, dismasting, or other potentially dangerous damage, don't panic, think about setting the chute instead! With the sea anchor deployed off the stern (**IT'S OK TO USE IT OFF THE STERN FOR NON-STORM, DAMAGE CONTROL SITUATIONS**), the boat stopped and its motions stabilized, you will have occasion to collect your thoughts, come to terms with your predicament and deal with it in a more efficient manner.

SEA ANCHOR DEPLOYMENT "A MATTER OF DRIFT"

The sea anchor in the water generates far greater **TURBULENCE** than does the hull of the boat, thus the boat drifts much faster than the chute, eventually coming up short against the rode, which pulls the bow into the seas. More than anything else, it is precisely this **DRIFT FACTOR** that enables the sea anchor to inflate and operate efficiently.

DEPLOYMENT EFFICIENCY

Deployment efficiency will vary from boat to boat, depending on how quickly the boat's drift will pay out the rode. Remember, it is not that the sea anchor has to exert a pull on the boat, but rather **it is the boat that has to drift to exert an initial pull on the sea anchor**, thus fully inflating it underwater and enabling it to obtain its iron grip on the sea.

In this connection please note: **When lying beam to the seas, vessels with deep draft and large keels will - by virtue of their now TURBULENT underbodies - drift very slowly...** So: Deployment will be relatively rapid for vessels with shallow draft and high windage. Deployment will take slightly longer for boats with moderate sized keels, and longer still for sailboats with full keels.



BOARDS AND RETRACTABLE KEELS Centerboards & Swing Keels: ❖ CAUTION



Lowering board/s and keels, or lowering them all the way, may give the yacht something to trip over. By and large, and as an important rule of seamanship, boards and keels should be raised in storms so that the yacht can "slip-slide," and not have something to trip over.

RUDDERS

If the sea anchor is large enough it does not appear that the strains placed on the rudder/s will exceed normal limits. Most fears about "drifting down on the rudder" are unfounded, as evident by extensive documentation contained in the *Drag Device Data Base*. Notwithstanding, if the rudder can be safely raised or removed (as on some multihulls) it would be a good idea to do so.

IF THE RUDDER CANNOT BE SAFELY REMOVED, IT SHOULD BE LASHED AMIDSHIPS, PREFERABLY WITH SEVERAL LAYERS OF THICK BUNGEE CORD TO ALLOW SOME MOVEMENT.

BEHAVIOR AT SEA ANCHOR

Generally speaking, vessels with symmetrical underwater shapes and high drift characteristics are given to behave well at sea anchor. This is especially true of multihulls, which can also use their wide beams as the anchor points for a steadying bridle. On the other end of the spectrum, vessels with deep draft should behave in a satisfactory way also, **providing the sea anchor's diameter is large enough**. In some instances, a **steadying sail** can be used at the stern to greatly improve behavior at sea anchor. **Some chain in the rode** might also be advisable for vessels whose bows are given to sail too much from side to side, **though always used in association with plenty of stretchy nylon line**. The chain may sink during slack cycles, and help to keep tension in the system.

STERN DEPLOYED SEA ANCHORS?

Large diameter Sea Anchors are NOT to be confused with drogues, and **ARE NOT RECOMMENDED FOR USE OFF THE STERN OF THE AVERAGE SMALL CRAFT IN HEAVY WEATHER SITUATIONS.**

In moderate conditions and stable seas, however, there is nothing wrong with using the big chute off the stern for rest & recuperation, for instance, or for stopping the boat and steadying its movements so a crew member can go safely up the mast.

BUT REMEMBER - Your Sea Anchor was designed for use off the bow and your boat was likewise designed to take the seas on the bow.

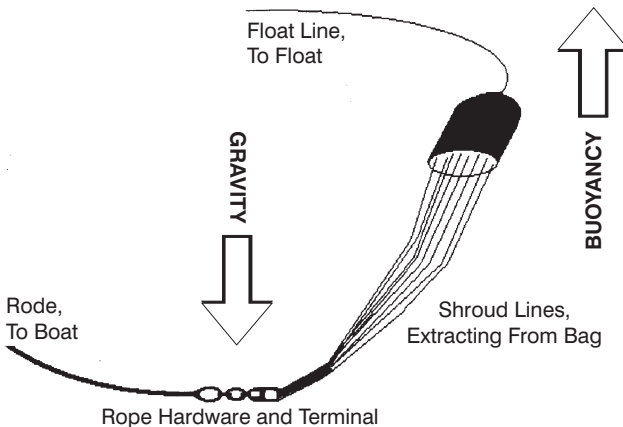
THE PARA-TECH® DEPLOYABLE STOW BAG (DSB)

The PARA-TECH® DSB is a heavy duty stow bag for your Sea Anchor. It has a convenient carrying handle that can also be used for securing it on deck or inside the boat. It also has a retaining strap to keep the shackle from coming loose when carrying the stowed Sea Anchor. The DSB is **DEPLOYABLE**, an integral part of the PARA-TECH® Sea Anchor.

It is not necessary to remove the Sea Anchor from the bag, the shackle is released from the stow strap (analogous to pulling the ripcord), the bag is tossed into the sea and the Sea Anchor then deploys from the bag. When retrieving, the chute and float line are brought on board, the bag is already on the float line, ready to slide onto and contain the Sea Anchor.

GRAVITY EXTRACTION

How does the Sea Anchor deploy from the bag? By the opposing forces of GRAVITY and BUOYANCY. Although the DSB and Sea Anchor may sink the DSB does provide a few pounds of positive buoyancy (there is always some air trapped in the canopy and bag to provide this). The parachute, shackle first, is then fed out by gravity. As the shackle falls from the inverted bag and sinks it extracts the lines and canopy.



DEPLOYING YOUR PARA-TECH® SEA ANCHOR

At sea all the system components must be intact, rode neatly coiled and arranged, connected and ready to deploy. Never take any Sea Anchor for granted: These are powerful devices that can wreak havoc on deck if carelessly deployed. **KEEP ARMS/ANKLES OUT OF THE RODE'S COILS**, and in the event of a hang-up, trip the chute, or that failing, **BE PREPARED TO CUT THE RODE ITSELF!!**

Deployment of your Sea Anchor is very simple:

Make sure all components are properly connected - floats & trip line attached to the float line - rode, swivel and chain attached and the end of the rode properly secured to the boat.

- ❖ Undo the shackle retainer strap to release the Sea Anchor shackle from the bag. This is equivalent to "pulling the ripcord". **NOT DOING THIS WILL MAKE IT IMPOSSIBLE FOR THE SEA ANCHOR TO DEPLOY FROM THE BAG.**
- Toss the trip line float into the water and clear of the boat, followed by the float line float and float line.
- Toss the Sea Anchor, bag and all into the water, making sure it is tossed into clear water and **NOT ON TOP OF EITHER THE FLOAT LINE OR TRIP LINE.**
- As the boat drifts away from the Sea Anchor you can pay out about 50 ft. of rode and snub the line to help the Sea Anchor open then snub the line often to keep tension in the system. **DO NOT FULLY CLEAT THE LINE WITH A SHORT RODE OUT BUT GIVE IT JUST A HALF TURN ON THE CLEAT.**
- When using a PARA-TECH Rode Stow/Deployment Bag for your rode the bag is tossed in after the Sea Anchor and the rode will deploy out of the bag.
- With adequate rode payed out, cleat/secure the rode, employ chafe gear and take a break.

DEPLOYMENT, STEP-BY-STEP "STANDING SET"

The safest method to deploy a Sea Anchor in heavy weather situations is to allow the boat's drift to pay out the rode. The step-by-step scenario is as follows:

- Head up into the wind, allow the sails to luff and the boat to stall.
- Deploy the Sea Anchor **ON THE WINDWARD SIDE** (NEVER on the lee side where the boat may drift over and foul with it).
- Undo the shackle retainer strap, toss trip line float, trip line and float line into the water, followed by the Sea Anchor (MAKE SURE THE SEA ANCHOR IS TOSSED INTO CLEAR WATER), followed by the rode.

REVIEW THE PRIOR PASSAGE

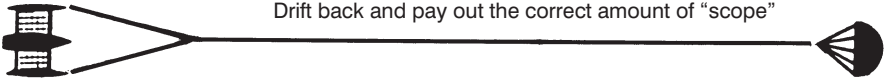
DEPLOYMENT, "STANDING SET"



Snub the line early to help the chute open



Drift back and pay out the correct amount of "scope"



NOTE: By using the "Standing Set" method you can deploy the Sea Anchor from the safety of the cockpit by running the rode OUTSIDE the rails and cleating it off to the full length and letting the rode out without snubbing as it pays out. The Sea Anchor will stay in the bag until the rode is fully deployed and then come out of its bag and open.

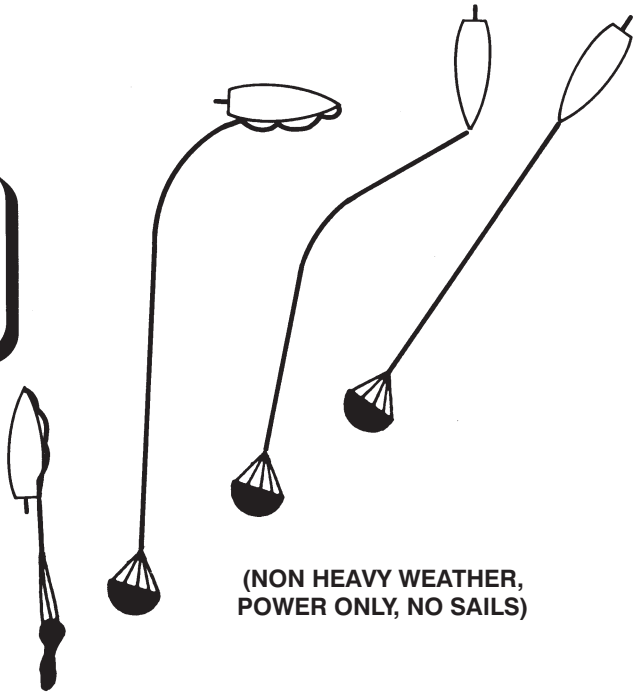
In non-heavy weather situations, an alternative method, often used by commercial fishermen, is known as the "FLYING SET".

"FLYING SET" (NON HEAVY WEATHER, POWER ONLY, NO SAILS)

1. Position the Sea Anchor, rode, etc. in the stern cockpit.
2. Secure the bitter end of the rode to the bow, outside all rails, stays, etc.
3. Put engine in slow forward and steer a course with the wind at 7 o'clock.
4. Deploy the trip line, float line, Sea Anchor, and rode off the stern.
5. Move the transmission in and out of gear to allow the rode to safely pay out behind the boat.
6. With all but the last rode payed out, take the engine out of gear and **WAIT FOR THE WIND TO ROTATE THE BOW SLOWLY INTO THE WIND.**
7. Cleat, chafe, break!

CAUTION: Because of the dynamic/shock loads involved in attempting to stop a heavy boat that is moving down wind as some speed, this second method, "FLYING SET", is **NOT RECOMMENDED IN HEAVY WEATHER SITUATIONS.**

||| "FLYING SET"
 WIND BLOWING FROM
 APPROX. 7 O'CLOCK

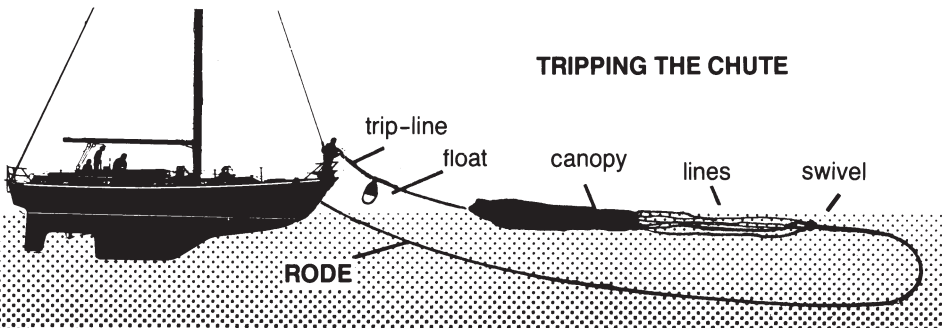


(NON HEAVY WEATHER,
 POWER ONLY, NO SAILS)

RETRIEVAL

To retrieve the Sea Anchor all you need to do is fetch up on the Trip Line Float and pull the Sea Anchor in by the float line and trip line. You can reach the float by either winching or motoring the boat to the float. Once you have the float you should slack off on the rode as you pull the Sea Anchor in. This procedure empties the water out of the chute, causing it to collapse into a limp sack collapsed on itself that can be hauled aboard easily.

Pull in trip line float, trip line, primary float, float line, canopy, lines, riser and anchor rode. Keep all of the components separated but in the same sequence. This will reduce the possibility of entangling the Sea Anchor lines with any other gear. **DO NOT** detach the anchor rode until the parachute is stretched out for repacking, and even then **ONLY IF IT IS REALLY NECESSARY**. Keeping the rode attached will help keep you from tangling the lines.



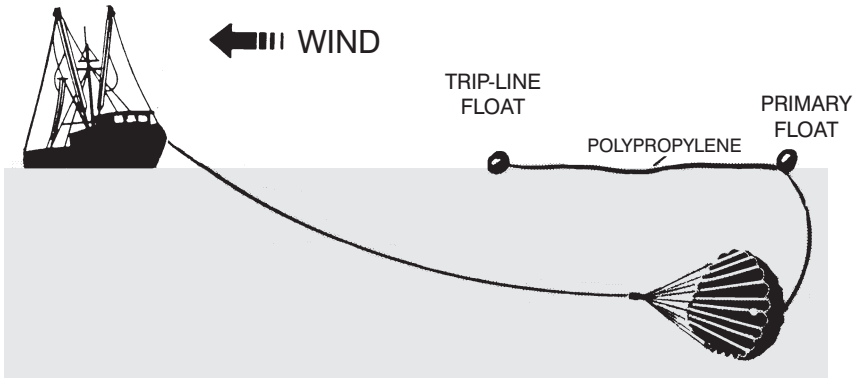
TRIP-LINE PROTOCOL

Though many choose to omit the trip-line, we consider one both necessary and wise. Remember, when retrieving the sea anchor, **one cannot pull the anchor to the boat**, rather **the boat has to be pulled up to the sea anchor, even if that boat weighs 10 tons!!** In retrieving the sea anchor the hard way (without a trip-line), some of our customers proceed as follows: They wait until conditions have moderated considerably. Then, they use a winch to haul the boat slowly upwind to the chute. When the sea anchor is within reach, the skipper or a crew member **pulls on ONE of the parachute lines, spills the water out of the canopy and brings the “limp sack” on deck.**

This way of retrieval is fine, unless there are big swells still running, and that's when we get into the problems associated with wave particle rotation. Remember, as you begin hauling the boat up to the sea anchor, you will eventually arrive at that delicate and precarious zone of conflict **where the heavy boat is being cycled downwind on the crest, while the unyielding sea anchor being cycled upwind in the trough.** As the two immovable objects diverge forces are brought to bear that are capable of damaging hardware on the boat, the rode or the sea anchor itself (to say nothing of producing horrendous jerks!) You can avoid this by the use of a trip-line.

PARTIAL TRIP-LINE

Drive the boat up to the float and use a boat hook to bring it on deck.

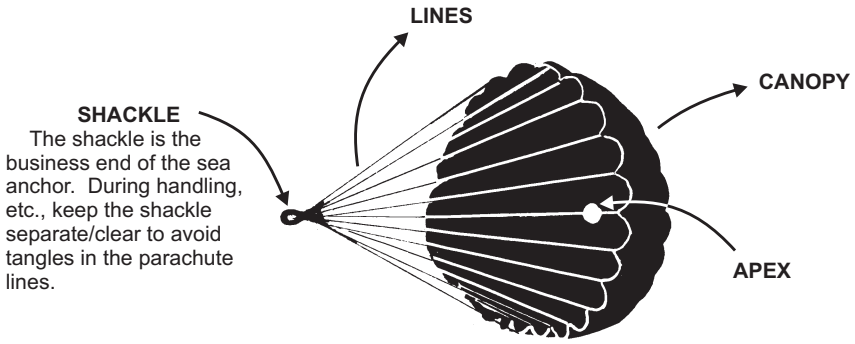


REPACKING THE PARA-TECH® SEA ANCHOR

Prior to deploying your PARA-TECH® Sea Anchor you should unpack and repack the system to familiarize yourself with the process.

NOTE: To minimize the chances of tangling the lines **DO NOT** disconnect the rode unless the Sea Anchor is packed and the shackle is stowed in its strap.

1. Slide the Deployment Bag to the top of the canopy.
2. Secure the apex (at the top center of the canopy) to a cleat (or something solid). Do this by tying off the float line about two feet from the apex.
3. Stretch the canopy and lines to the shackle and pull snug at the shackle.
4. Make sure the radial webs are on the **OUTSIDE** of the canopy. If not, the canopy is inside out. Turn the canopy right side out and straighten the lines.
5. Verify the lines are straight by separating the riser into two groups and, while keeping them separate, trace them to the bottom of the canopy. The two groups should remain separate with no lines from one group wrapping around the other group. If not, the lines are tangled and must be untangled before you proceed. **NOTE: If the lines are partially tangled the Sea Anchor will still function but the tangles will cause line wear and eventually lead to line failure.**
6. Once the canopy and lines are straight slide the bag over the canopy with the float line pulled to the outside of the bag and fold the Sea Anchor into the bag (it is not necessary to neatly fold the canopy, just stuff it in the bag). The important part is that the lines have equal tension (or slack) between the canopy hem and riser (there are no lines which are looser than the others).
7. Make three or four loose coils with the lines on top of the canopy. Lay one of the tongue flaps (sewn to the inside the bag) over the lines and make 2 to 4 more coils of line. Fold another tongue flap over these lines and continue in the same manner. **NOTE:** the 6' and 9' Sea Anchors do not have these flaps so just coil the lines on top of the canopy.
8. The last flap should go over the line/ riser junction.
9. With about one foot of riser outside the bag, thread the elastic loop through the other three grommets, fold the riser and tuck it through the loop. This keeps the bag closed. Secure the shackle to its stow strap then detach the rode.
10. Stow the float line in the 'roo pouch in the bottom of the bag by S-folding it in your hand and stuffing it in the pouch.



CARE & MAINTENANCE

Your system is constructed from modern materials and should last many seasons with proper care.

AVOIDING TANGLES

Sea Anchor lines are easy to tangle if handled carelessly (Murphy's Law No. 392.6). Handle your Sea Anchor carefully & deliberately, especially when it first arrives. Take note of how it is packed and how the lines and shackle are stowed, ready to have the anchor rode and swivel attached. By attaching the rode before doing anything else you will greatly reduce the chances of tangling the lines. The lines **MUST** be kept straight so the Sea Anchor will open properly and there will be no chafe from the lines against one another.

FACTORS AFFECTING WEAR Harmful Salt Crystals

It is OK to store your chute wet after being in sea water but abrasive salt crystals will form if it is allowed to dry without rinsing in fresh water. When in port., rinse the system with fresh water and allow it to dry slowly in the shade (**NEVER** in direct sunlight). Once it is wet with sea water, keep it wet until you can properly rinse and dry it.

Harmful Ultraviolet Rays

Direct exposure to the sun's harmful rays will weaken the materials your Sea Anchor is made from. When not stored below it **MUST** be packed in its deployment bag. The bag will help shield the Sea Anchor from sunlight induced degradation. When in port we strongly recommend stowing it below or in a locker.

Your Sea Anchor is a very important piece of survival equipment and as such **MUST** be kept in good condition. Inspect the system for damage or excess wear after each deployment, especially after using in heavy weather.

Most Sea Anchor damage is a result of snagging on the boat during deployment or recovery. The Deployable Stow Bag (DSB) greatly reduces this potential. Proper deployment and keeping the lines straight will reduce the possibility of damage to almost zero. **PARA-TECH's** Sea Anchors are designed to be damage tolerant... they will still function even with a damaged panel or some broken lines.

DAMAGED CANOPY WEBBING

This webbing runs from the lower hem to the apex of the canopy and around the upper and lower hems. If **ANY** of this webbing is damaged it **MUST** be repaired or reinforced before using the Sea Anchor again.

DAMAGED APEX LINES

These lines cross the apex (the hole in the center) of the canopy . . . they are a **MAJOR** structural part of the Sea Anchor and if damaged or broken they **MUST** be replaced or reinforced before using the Sea Anchor again. Spliced or replaced apex lines must be the **EXACT** length of the others.

DAMAGED LINES

As stated before, the Sea Anchor will still work even with a broken line but at reduced drag. Damaged lines may be spliced with the same or equivalent nylon line. The lengths must be the same as the others. Temporary repairs should be replaced as soon as possible to ensure the overall integrity of the system.

REPAIRS TO THE CANOPY

Small holes or tears should be repaired as soon as possible. Tears less than a foot long can be temporarily repaired by using adhesive backed sail repair tape. The tape must be placed on both the inside and outside of the canopy and extend at least one inch beyond the tear then sewn around the perimeter of the tape. Once back in port you should have it repaired by a competent sailmaker, parachute rigger or return it to PARA-TECH® for repair.

SPECIAL NOTE: If you are in a situation where you need your Sea Anchor and it is damaged, use it anyway. 60 to 80% Drag is better than no drag and not using it may lead to disaster. The PARA-TECH® Sea Anchor is designed to function even when damaged.

REDUCING SIDE-TO-SIDE YAW ON MONOHULL SAILBOATS

All monohulls have a tendency to "sail" or "hunt" at anchor. This tendency can be exaggerated by various factors like the boat's underwater profile, mast location, amount of windage fore and aft, ratio of waterline length to length on deck, type of rudder, etc. Purely from the anchoring point of view some boats have built-in vices that make them ill behave on a hook or Sea Anchor. There are other *variables* at work here. Fortunately they can be manipulated to reduce side-to side yaw and improve behavior at anchor or Sea Anchor. Some of these variables are listed below in order of importance:

WINDAGE AFT

A small, flat (no belly, no roach) vane type mizzen sail, tightly sheeted and properly trimmed with leach and foot lines will work wonders on a ketch. A heavily built staysail raised on its own separate track on the mast will almost certainly reduce yaw on a modern sloop. So will a storm jib, hanked onto the backstay, raised by the topping lift and properly trimmed by leach and foot lines. Any sort of windage aft is bound to improve the picture. Some sailboats have a stainless steel radar arch/platform over the cockpit, with owners reporting a significant reduction in yaw. Improvise. Be creative. Use anything and everything available. A dinghy lashed to the stern rails may work wonders. (With survival at stake Joe Byers of *Doubloon* fame lashed a mattress to the mizzen mast with good results - - see Heavy Weather Sailing, Chapter 18).

WINDAGE FORWARD

Nowadays a great many boats have large amounts of forward windage in the form of a roller furling jib. A 50 Ft. long by 4" Dia. tube has an area of about 17 square feet. This a significant amount of windage if the wind is blowing 50 knots, making the bow fall off in high winds. A huge difference may be noted if the roller jib is dropped before a storm hits.

BOW ATTACHMENT POINT

On some boats the rode can be led off the bow side chock or hawse hole (instead of the anchor roller mounted on the centerline of the boat). The yacht will then lie a few degrees off the wind. This may be preferable to the yaw and yaw-induced roll when the rode is led off the centerline of the boat. **WATCH FOR CHAFE!!!**

THE USE OF POWER

If side-to-side yaw is still a problem, start the engine and place it in SLOW REVERSE. This will slowly move the yacht away from the Sea Anchor and have a significant effect in terms of reducing yaw. Do not apply too much throttle as this will reduce the stretch in the rode. The rode's elasticity must be maintained so it can buffer forces associated with wave loading.

ADDITIONAL IDEAS/SUGGESTIONS

Much has been learned over the years since PARA-TECH® began producing Sea Anchors. Many users, for example, have stated that in heavy weather the Sea Anchor is best deployed from the safety of the cockpit. We suggest you devise a method of launching everything from the safety of your own cockpit. To do so it would be helpful to have a "pigtail" in place.

PIGTAILS

A "Pigtail" (not to be confused with a snubber) is a short line, preferably one size larger than the main rode. It should be long enough to attach to the bow (either cleat or anchor chain) and reach the safety of the cockpit. It should have thimbles spliced in one or both ends. This pigtail should be positioned and secured before leaving port and secured OUTSIDE the rails. It can be lashed in place with break cord or fine nylon thread (some sailors use dental floss). Make sure it is led OUTSIDE stays, rails, stanchions, etc.

With the pigtail in place you should not have to crawl out onto the slippery bow to deploy the Sea Anchor. When deployment is imminent . . . position the Sea Anchor, rode, etc. in the cockpit and attach the rode to the Sea Anchor and pigtail. Make sure EVERYTHING is routed OUTSIDE the rails. Head up into the weather to "stall" the boat and deploy the Sea Anchor on the windward side of the boat.

CHAIN: If attaching to your anchor chain you will need to let out the chain BEFORE the Sea Anchor sets. If this involves a trip to the bow, MAKE SURE YOU ARE WEARING A SAFETY HARNESS CLIPPED ON TO AN ADEQUATE JACKLINE. Prior to deployment, decide the amount of chain you will be letting out. NOTE: you can paint your chain at various lengths to make it easy to determine how much has been let out. In moderate conditions, for example, you may want to let out 25 to 50' of chain. In heavy weather, you may need to let out 100- 200' or more of chain. By marking the chain at intervals you can let out the desired length and secure it with snubbers, etc.

NOTE: The *Drag Device Data Base*, by Victor Shane lists these and other ideas in book form. The case histories it contains catalog much of what we have learned - and unlearned - in past years. Be sure to obtain a copy and study it before putting out to sea.

BRIDLING THE ILL-BEHAVED MONOHULL

Depending on a number of variables (rigging, keel, rudder configuration, etc.), some monohulls point comfortably into the wind and seas. Others don't, yawing uncomfortably from side to side. Those that don't may benefit from bridling to hold them steady at some angle to the weather. (The use of a properly rigged storm trisail may increase comfort as well.)

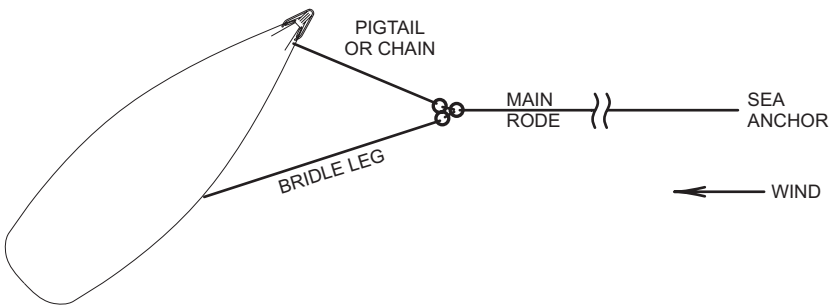
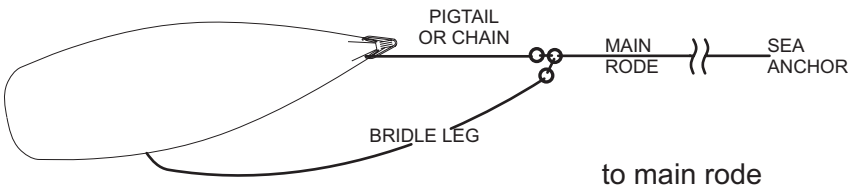
Archimedes once said "give me a lever long enough and I will move the Earth." The key element is LEVERAGE. Multihulls obtain that leverage by attaching their bridles to hulls that are widely spaced apart. Monohulls can obtain a similar mechanical advantage by attaching a bridle to TWO different parts of a single hull, one well forward and the other further aft.

The bow attachment is usually the bow-cleat or Samson post. The rear attachment point will differ from yacht to yacht and will have to be determined by the crew - some may opt to lead the aft bridle leg to a cockpit winch though a rail mounted snatch-block, for example.

Everything else being equal, the farther the distance between attachment points the greater the leverage. Measure that distance and multiply by 2.5 to obtain a rough idea of the length of the PIGTAIL (see illustrations below). If that distance is 10 feet, for example, then the PIGTAIL should be about 25 feet and BRIDLE LEG long enough (pigtail plus boat's LOA) to reach the attachment point wherever it may be.

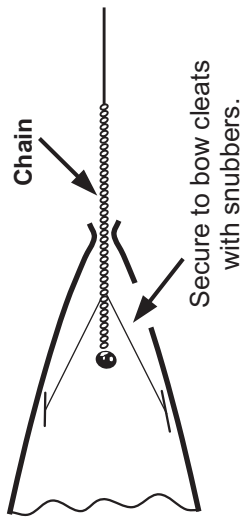
DEPLOYMENT:

1. Heave to with Pigtail on windward side of boat.
2. Deploy Sea Anchor and rode from cockpit and wait until it sets.
3. Sequence: Trip Line, Primary Float, SA, Rode & Bridle or in reverse order.
4. Once SA is set the boat may tend to yaw from side-to-side.
5. When boat yaws to windward side, take up the slack in bridle leg and cleat it off then adjust for the most comfortable ride.

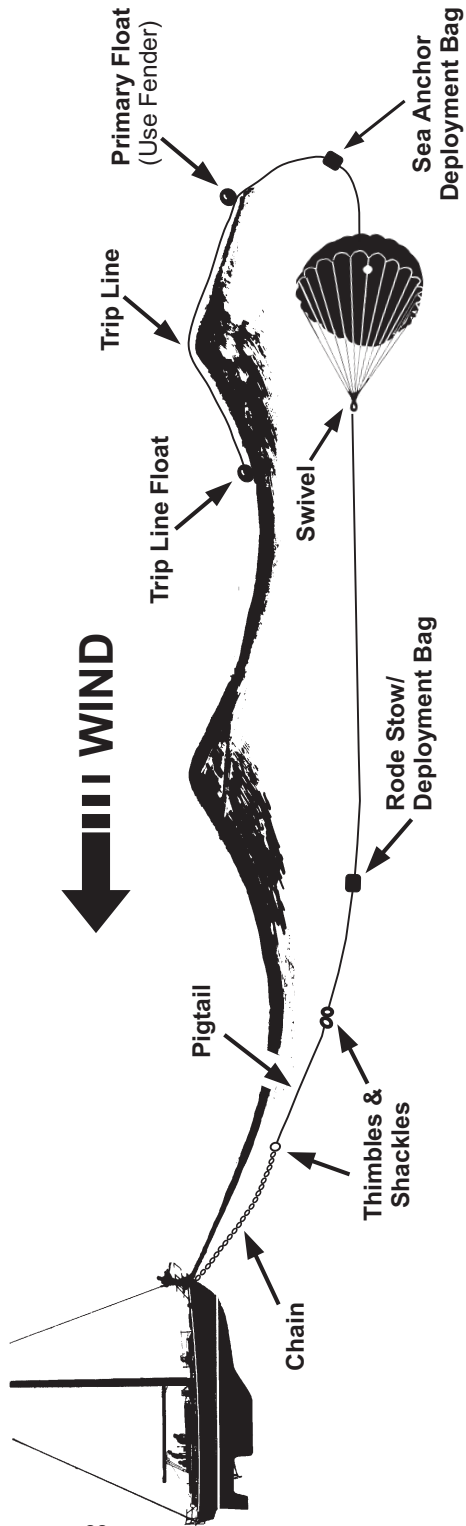


NOTE: If you are using chain off the bow you must remove the anchor - if this cannot be done then you must use a length of chain as a stand-off to keep the anchor flukes from contacting the rode or bridle leg as the flukes can cut the rode.

RIGGING FOR MAXIMUM CHAFE PROTECTION



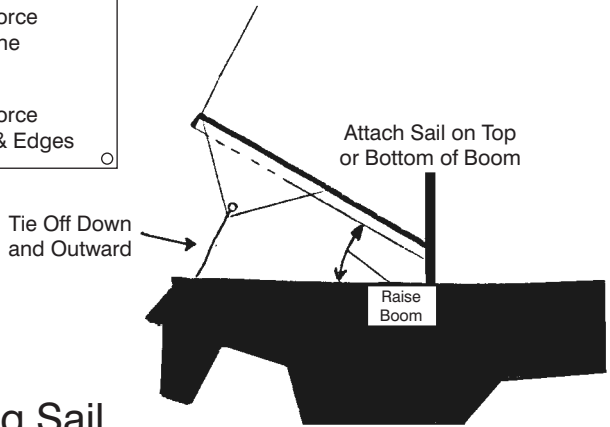
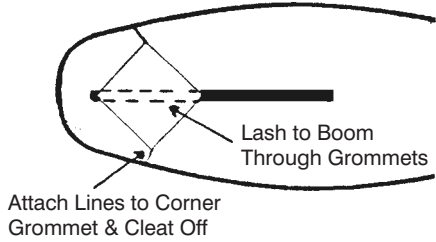
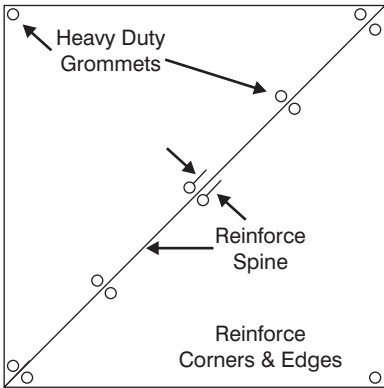
Chain should be secured to deck cleats or Samson post with snubbers in order to not load the windlass. Chain should also be secured to the bow roller, to prevent "jumping out" of the chain.



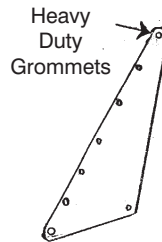
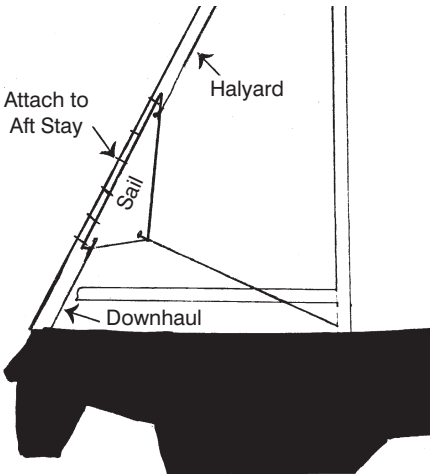
The amount of chain let out depends on the conditions. In moderate conditions just a few feet for chafe protection and up to 20% of the overall scope of the rode in heavy weather.

RIDING SAIL OPTIONS

The use of some sort of riding sail will add greatly to the stability and comfort of the yacht while at anchor, whether it be Sea Anchor, mooring buoy or ground anchor. The following are two ideas which you can try. Consult your sailmaker for sizing and materials.



Delta Riding Sail



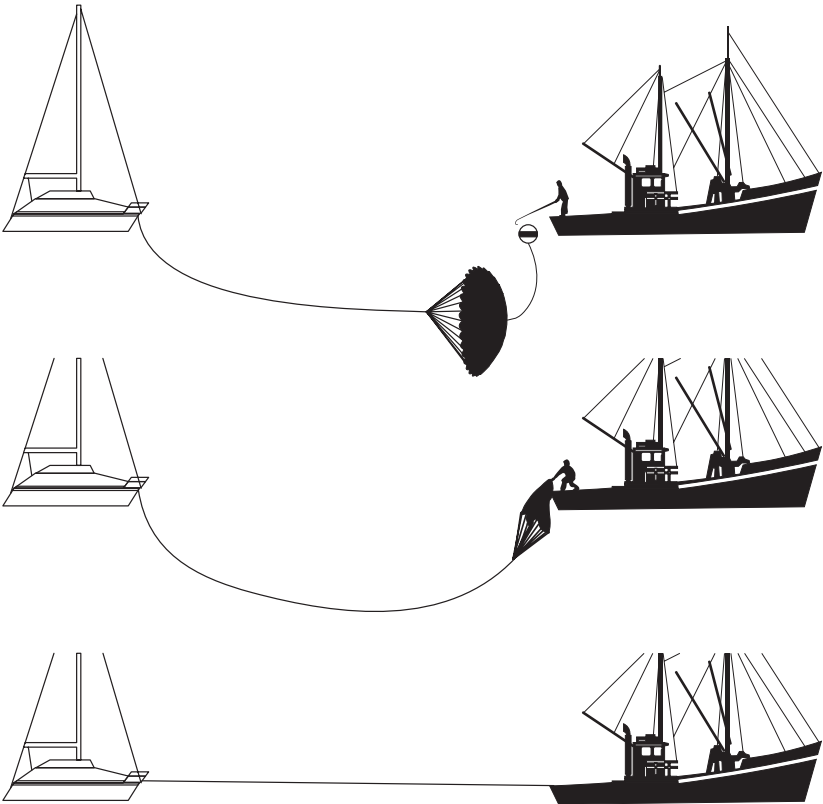
Flat Riding Sail

BEING TAKEN UNDER TOW

If your boat is disabled and you are riding on your Sea Anchor the safest and easiest way to be taken under tow is as follows:

Have the skipper of the towing boat pick up the trip line, pull the Sea Anchor in and temporarily bag it then cleat the rode and start the tow.

This method avoids the boats getting into close proximity in order to heave lines and risking collision. The towing boat comes UPWIND of the disabled boat placing the disabled boat in its wind shadow and can maneuver at will to pick up the Trip Line with virtually no risk of collision.



EASY TOW LINE TRANSFER

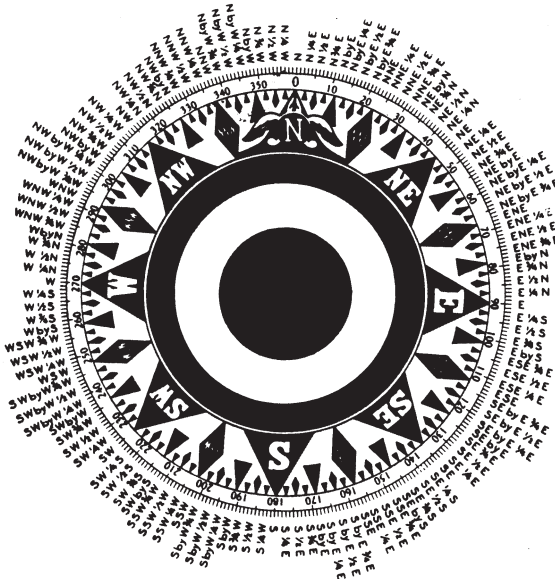
IN SUMMATION

More and more small boats are putting out to sea nowadays, seeking independence of a higher sort, as well as a measure of relief from a world in turmoil. Of these, the majority are disillusioned in short order, their preconceived notions about calm seas, balmy breezes and swaying palm trees rudely displaced by the harsh realities of ocean crossing.

Happily, however, there are also those, who rise to the occasion, meet the challenge head-on, survive it all and return. These are a rare breed, whose lives have been intensified by the encounter with the sea, and whose very souls have been made to conform to higher codes of self-discipline and liberty. Ask any one of these whether the whole thing was worth it, and the majority will tell you, YES, it was all worth it, and that the rewards of such epic endeavors are ample and enduring in every respect.

Harbor no illusions about the unpredictable sea. To quote the words of Webb Chiles, "The fallacy is in expecting anything at sea to be as it 'should be'." Indeed there are no guarantees out there, and we cannot offer you one, implied or otherwise. What we do offer is the experiences other mariners who have benefitted from our sea anchors, and a long term program (the "DRAG DEVICE DATA BASE") that catalogs and disseminates accurate information about drogues and sea anchors.

It only stands to reason that as more and more heavy weather files are added to the database, the pieces of the jigsaw puzzle will slowly fall into place, systematically increasing our knowledge on the subject of offshore safety, and this in itself is a good and worthwhile cause to contribute to, as we go sailing across the oft hostile interfaces between sea and sky with all of the uncertainties — and challenges — that they still hold for the contemporary mariner.

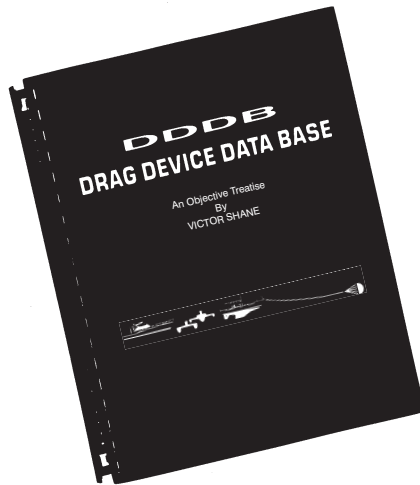


A SPECIAL NOTE ON YOUR DECISION ON WHETHER OR NOT TO SET YOUR SEA ANCHOR . . .

What is the one thing that if you ever need and don't have you will NEVER need again? A PARACHUTE! This is especially true in the aviator's world but still applies in the mariners world.

WHEN IN DOUBT . . . SET IT OUT!

We strongly urge you to completely unpack the Sea Anchor from the bag, paying careful attention to how it is packed and repack the chute to familiarize yourself with the packing. Refer to packing instructions.



PARTICIPATE IN THE DRAG DEVICE DATABASE PROGRAM

The **DRAG DEVICE DATA BASE** was originated by Victor Shane, founder of **PARA-ANCHORS INTERNATIONAL**. This revolutionary idea brings together sailors, editors, experts on safety and draws from their knowledge and bluewater experience to enhance offshore safety for all mariners, while its companion publication collects and catalogs accurate files on instances where drogues and sea anchors have been used in heavy weather (copies can be purchased through **PARA-ANCHORS INTERNATIONAL**).

If you have occasion to use your drag device, please fill out and return the **DDDB** that was enclosed with it. **THANK YOU!**



Manufactured By:

PARA-TECH® Engineering Co.

2117 Horseshoe Trail

Silt, CO 81652

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