

A photograph of a sailboat on a dark, choppy sea under a cloudy sky. The boat's white sails are partially visible, with one large sail rolled up on the boom. In the foreground, a person in a bright yellow waterproof jacket and white cap is seen from behind, looking towards the cockpit. Another person in a red jacket is visible further back on the deck. The overall scene conveys a sense of being prepared for a storm.

Storm Survival Tactics

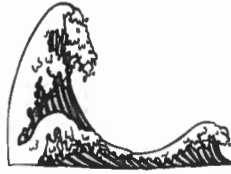
by John Neal &
Amanda Swan Neal

www.mahina.com

BLUE WATER
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STORM SURVIVAL TACTICS INTRODUCTION



The Purpose of this Seminar and Book - to provide an overview of the following:

- Selecting you Boat and Equipment
- Understanding Weather and Terminology
- Storm Procedures – pre-departure and during storm conditions
- Ten Storm Tactics – cautions and advantages of each tactic
- Seasickness - prevention and treatment
- Dealing with Anxiety and Fear in Storm Conditions

Perspective

Storm survival tactics often fascinate sailors new to ocean passagemaking. Sailors should be prepared for and practice storm tactics, but reality is that if they time their passages during optimum seasons and around the weather patterns, have a boat capable of 150+ miles per day and use the wealth of weather information available, most will sail many years before encountering sustained winds above 45 knots.

Authors Storm Experience

John and Amanda Neal sail an average of 10,000 annually aboard Mahina Tiare and have conducted sail training expeditions to the high-latitudes of Alaska, Norway, Scotland, Patagonia and Antarctica interspersed with tropical sailing expeditions. Onboard Mahina Tiare weather, storm avoidance and tactics, along with safety protocols are an important part of their curriculum.

On John and Amanda's first shared expedition passage in 1994 they encountered the leading edge of the Queen's Birthday Storm in which six boats and three lives were lost. After a combined total of 732,000 miles and 89 years ocean experience, John and Amanda have only encountered sustained winds over 45 knots in the high latitudes of the Southern Ocean 15 years ago and never in temperate latitudes. However they constantly watch the weather and have delayed departure, slowed down or speeded up and made unscheduled stops to avoid bad weather.



ABOUT THE AUTHORS/SEMINAR PRESENTERS

John Neal

Born in on the shores of the Blue Nile, John sailed away from Seattle on a 27' sloop for the South Pacific in 1974 at age 22, wrote *Log of Mahina*, a best seller, and has since sailed 387,000 miles. Since 1976, John's passion has been sharing his knowledge of ocean cruising. John has conducted 210 sail-training expeditions to exotic locations including the South Pacific, Cape Horn, Antarctica, Europe and the Arctic aboard *Mahina Tiare II & III*. John holds a USCG 100-ton master's and private pilot's license.



Amanda Swan Neal

Amanda grew up in New Zealand and sailed to Vancouver as a teenager in a boat she helped her family build. Upon returning down under she became a sailmaker and rigger completing the 1989 Whitbread Around the World Race aboard *Maiden*, the first all-women Whitbread boat. She has logged 345,000 miles including two Sydney-Hobart races, seven Cape Horn roundings, and has additional sailing experience on tall ships and women's coaching. Amanda has co-lead expeditions aboard *Mahina Tiare* since 1994, is author of *The Essential Galley Companion* and *Marine Diesel Engines* – a learning and coloring book, and holds a NZ commercial launch masters license.

Mahina Offshore Sail Training Expeditions

John and Amanda annually sail 10,000 miles in six months aboard *Mahina Tiare III*, a Hallberg-Rassy 46. They conduct unique and dynamic hands-on offshore sail-training passages, with documentation, for sailors wanting to master ocean voyaging skills. View www.mahina.com for details and to view past expedition log updates.

Mahina Offshore Cruising Seminars and Workshops

To help sailors prepare for safe, self-sufficient voyaging worldwide on their own boats John and Amanda annually present several one-day seminars and an weekend workshop. Venues include: Annapolis Toronto, Chicago, Vancouver BC, Seattle and Richmond CA. Details on www.mahina.com.

Boat Purchase Consultation

Since 1977 John has helped over 1,000 clients worldwide locate and evaluate the best possible boat for their proposed cruising for a flat fee of \$750.

Visit www.mahina.com/consult.html



Both John and Amanda write for several national and international magazines. Since 2005 Amanda has written the monthly column "Galley Essentials" for 48 North magazine and *Cruising World* magazine featured her insightful four-part article on women and cruising.

When not at sea, John and Amanda live on San Juan Island, Washington, spending any free moment outdoors kayaking and cycling.

SELECTING YOUR BOAT & EQUIPMENT



1. Understand **boat design** so that you will choose an appropriate boat based on your cruising plans.
2. **A boat needs to be safe**, comfortable and offer you the most options for avoiding and handling storm conditions. This is very important for your safety and comfort!

Positive attributes include:

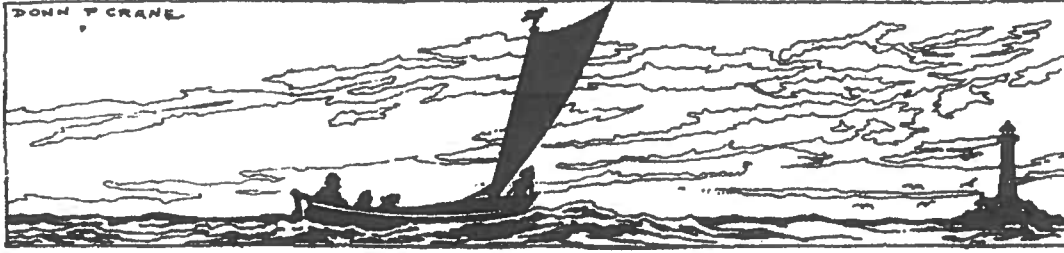
- a. Ability to sail 160-200 miles a day.
- b. Moderate underbody – a wide flat-bottomed boat will pound going upwind and generally will not forereach or heave-to satisfactorily.
- c. Moderate keel with a deep bilge.
- d. Strong and simple rig: ideally with a fixed backstay, removable running backs, removable inner forestay for a storm staysail and in-line spreaders.
- e. Simple and strong steering system.
- f. Protected helm position – a rigid dodger is superb in storm conditions.

Resource: www.mahina.com/book.pdf. Selecting and Purchasing an Ocean Cruising Sailboat. Includes an extensive and updated list of boat to consider.

3. **Sail the boat** as much as possible practicing heaving to, fore reaching and man-overboard, reefing.
4. **Sail at night** and have appropriate equipment: headlamp, safety harness & lifelines.
5. Develop **safety procedures**: standing orders, watch orders and emergency station bills
6. Develop and post a **Sail Reduction Guide** so everyone knows the correct sail combination for wind speed. A long-distance cruise is not the place to stress your boat, rig and sails by trying to see how much sail you can carry and how fast you can push the boat. The best time to reef or change sails is when you first think about it, since waiting for conditions to worsen puts a strain on the crew, and equipment. This is one of the most serious problems for inexperienced ocean sailors. It is always best to be conservative until you really understand how much speed the crew, steering system and boat can handle. You will be surprised that often after reducing sail boat speed is the same and leeway is reduced, resulting in a better course made good. Modern sailboats sail best at moderate angles of heel, not with their rails in the water.
7. **Study** Voyager's Handbook by Beth Leonard, The Art of Seamanship by Ralph Naranjo, and Surviving the Storm by Steve Dashew.
8. **Storm sails** are essential for extended cruising. Practice using them.
9. Outfit with **storm management devices** applicable to your vessel. Practice using them.
10. Practice using the **radar**. StarPath Radar Trainer is an excellent computer instructional program.
11. Ensure your **wind speed and direction instruments** are accurate and dependable for easier determination of sail combinations.
12. Study and learn as much as possible about **marine weather**.
13. To receive weather information and be in communication with a commercial weather router install either an **Iridium GO!** terminal (\$750), **Iridium satphone** (\$600-1,200) or a marine SSB radio with modem (\$6,000).



SAIL REDUCTION GUIDE



This Guide is only an example. Your boat may require reefing earlier or later than the noted true wind speeds.

Shoaling water, current opposing the wind or crossed swells can dramatically worsen sea state and boat performance.

Wind forward of the beam

17 knots, 1st reef in mainsail, 10% of genoa furled.

23 knots, 2nd reef in mainsail, 20% of genoa furled.

28 knots, 3rd reef in mainsail, 30% of genoa furled, increase backstay tension if possible.

35 knots 3rd reef in mainsail or drop main and hoist trysail.

Storm jib or storm staysail replaces furled headsail. Set running backs.

45 to 55 knots, forereach or heave-to if your destination is upwind. Wait for directional change.

Wind aft of the beam

22 knots, 1st reef in mainsail, full 125% furling genoa.

28 knots, 2nd reef in mainsail, 20% of genoa furled.

34 knots, 3rd reef in mainsail, 30% of genoa furled. Rig inner forestay.

40 knots, 3rd reef in mainsail, storm staysail. Set running backs. Increase backstay tension.

45 knots, storm trysail and storm staysail, dropping staysail if boat becomes difficult to steer because of excessive boat speed.

Tactics for Storm Conditions with Sustained Winds Above 45 Knots:

- Forereach under trysail or triple reefed main.
- Heave-to under trysail and storm sail. This may be uncomfortable above 55 knots.
- Run or broad reach downwind under minimum storm sail or under bare poles, towing warps or drogue if required. Hand steering may be required to counter rogue waves or the tendency to broach.
- Contact a professional weather router if you are in sustained winds above 45 knots or a tropical depression is forecasted within 400 miles.



WEATHER PLANNING



Watch the Seasons

Don't push the edge of hurricane seasons. Resources for routes and passage timing include:

1. **World Cruising Routes** by Jimmy Cornell, www.noonsite.com
2. **Atlantic and Pacific Crossing Guides**, RCC Pilotage Foundation
3. **Cornell's Ocean Atlas**, Pilot Charts, Visual Passage Planner

Hurricane Seasons Northern Hemisphere-June, July August, **September** and October.
Southern Hemisphere-November, December, January, **February**, March and April.

Learn About the Weather

1. **RYA Weather Book**: Chris Tibbs
2. **Windy.com**
3. **PredictWind.com**
4. **Internet Weather information**: weather.noaa.gov, setsail.com, starpath.com

Nine Tools for Weather Monitoring

1. **Recording Barometer**: starpath.com, speedtech.com, weems-plath.com
2. **VHF Radio** for receiving local marine weather forecasts
3. **Iridium** or **BGAN** for www access
4. **Internet** access either through wi-fi aboard or from internet cafes ashore to view more data-intensive weather sites. Broadband USB devices are frequently the best option.
5. Either dedicated **weatherfax** receiver/printer: Furuno Fax 207 or 408 or:
6. **Software** for receiving weatherfaxes utilizing Iridium, or SSB receiver with Sailmail and Pactor modem
7. **GRIB Files** through www.saildocs.com
8. **Navtex**, an excellent resource for receiving coastal forecasts, in English in Europe

Weather Before Departure

1. Study books on **regional marine weather** so that you will recognize and know how to deal with unusual specific weather conditions.
 - The Concise Guide to Caribbean Weather— David Jones (excellent, though OP, avail. thru Amazon)
 - Mexico Weather for Boaters – Pat Rains
 - Mariners Met Pack – Bob Mc Davitt
 - Weather at Sea – David Houghton
 - Mediterranean Weather Handbook for Sailors – Roberto Ritossa
 - RYA Weather Handbook – Chris Tibbs
2. **Study weather patterns** for at least one month before departure.
3. Establish an account with a **professional weather routing** service particularly if the passage you are attempting has the potential for powerful and dynamic weather patterns: crossing the Gulf Stream, Bay of Biscay, WA-OR-NoCal coast, sailing to and from New Zealand, etc.
4. **Time your departure** to utilize favorable winds and the maximum weather window, without arrival time constraints such as family and friends arriving.

Weather Underway

1. Record **barometric pressure** hourly in the ships log: awareness and trends are key!
2. **Check in daily** on a SSB or Ham Weather Net (optional).
3. Analyze and **monitor the weather daily** using weatherfax, Navtex, or satellite images.

4. Be flexible and prepared to **slow down or speed up** to let unfavorable weather systems pass.

Weather Routing

- Commander's Weather** • www.commandersweather.com • info@commandersweather.com. Affordable rates and leading US-based router covering the entire world. This is the company we use and recommend.
- Marine Weather Center** • www.mwxc.com • Chris Parker, located in FL is the official forecaster for several East Coast to Caribbean rallies • 863-248-2702
- Locus Weather** • www.locusweather.com • e-mail locuswx@midcoast.com • Routing packages for either coast.
- MetService New Zealand** • www.metservice.co.nz.
- MetBob** • www.metbob.com • Bob McDavitt, recently retired from MetService NZ now provides private weather routing covering the South Pacific and beyond. We use him.
- Passage Weather** • www.passageweather.com • Free worldwide GRIB weather files.
- Russell Radio** • www.russellradio.org.nz • russellradio@clear.net.nz • Radio service yachts arriving and departing N.Z.
- Starpath** • www.starpath.com • e-mail info@starpath.com
- Susan Genett's Real Weather Ltd.** • www.realwx.com • email forecast@realwx.com. • Formerly with National Weather Service now runs her own global routing service based in Newport, Rhode Island.
- WxAdvantage**, Bill Biewenga • www.wxadvantage.com • e-mail billbiewenga@home.com
- Weather Routing Inc** • www.wriwx.com • NY-based company providing forecasts for commercial shipping and yachts worldwide.
- www.Weatherguy.com** • email weatherguy@weatherguy.com • 808.254.2525 • Rick Shema, a former U.S Navy meteorologist now based in Hawaii specializes in West Coast and Pacific routing.

Weatherlinks and Resources

- www.buoyweather.com • 2 day forecast for any location worldwide.
- www.marineweather.com • comprehensive weather site.
- www.noaa.gov – National Weather Service • Resources for weather faxes and forecasts.
- www.nws.noaa.gov/om/marine/radiofax.htm • worldwide weather fax schedules
- www.passageweather.com • source for worldwide GRIB files.
- www.predictwind.com • the future of weather prediction services
- www.saildocs.com • GRIB weather files.
- www.windy.com • graphic and accurate display of the worlds winds and currents.
- www.worldclimate.com • monthly rainfall and temperature records for many locations.
- www.xcweather.co.uk • European weather forecasts

World Distribution of Tropical Storms


Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
South West Pacific												
West Coast of Mexico												
Caribbean & Southern USA												
West North Pacific												
Northern Indian Ocean												
Southern Indian Ocean												


WEATHER TERMINOLGY





1. The sun is a source of warmth, heating the surface of the earth and creating the process of **convection**. The principle of convection conveys warm, moist tropical air aloft, creating clouds, this air then descends into the "Horse Latitudes" of between 30°- 40° N. latitude and 30°- 40° S. latitude.
2. Air moves from high to low pressure. Between the two points, there is a **Standard of Measurement: 1013 millibars**. Pressure readings above 1013 are considered high pressure, and below 1013 are considered low pressure. High pressure generally means good weather, low pressure, bad weather.
3. An **isobar** is a line joining points of similar barometric pressure. ISOBARS form shapes and patterns and when they enclose areas of pressure they are called HIGHS or LOWS. Winds follow ISOBARS and the closer the ISOBARS are spaced the stronger the wind.
4. **Lows** or depressions are labeled with an "L" or "C". Another name for a low is cyclone. Wind goes **clockwise around lows in the Southern Hemisphere** (and counterclockwise in the Northern Hemisphere) towing in 15-20 degrees. **Shallow** low: 1000 - 1012 mb, **moderate** 980 - 1000 mb, and **deep** or **intense** low is below 980 mb. A complex low has two or more centers and can mean severe weather. If the central pressure is rising the low is **filling**. If the central pressure is dropping, the low is **intensifying** or **deepening**. The deeper the low, the stronger the winds and heavier its rain. Lowering pressure is caused by air rising and being drawn off by upper winds faster then it can be replaced by the lower winds. Moist air weighs less than dry air and causes lower surface pressure.
5. **Highs** or anticyclones are labeled on a weather map by an "H" or "A". Winds go **counterclockwise around a high in the Southern Hemisphere** (and clockwise in the Northern Hemisphere), leaking outwards 15-20 degrees across the isobars. A **weak** high has a central pressure above 1015 mb and a **strong** or **intense** high is above 1030 mb. If center pressure is above 1030, expect gale force winds somewhere on the high's perimeter. Intensifying means a rising central pressure, and weakening means a falling central pressure. Rising pressure is caused when light surface winds do not carry away the sinking air as it arrives. Air weighs more when it is colder and drier. The center of a high is an area of light winds.
6. When the wind **backs** it changes direction in a **counter clockwise** direction. This is an indicator of incoming bad weather associated with the passage of a low. When the wind **veers** it changes direction in a **clockwise direction**. This is also called clocking.
7. **Hurricane Seasons** Northern Hemisphere-June, July August, **September** and October.
Southern Hemisphere-November, December, January, **February**, March and April.
8. **Bomb** is the name given to a low or depression whose central pressure falls more than 14 millibars in 24 hours at 30 degrees latitude.
9. **Squash Zone** is an area of strong winds formed when isobars between a high and low become compressed and can produce the most severe weather possible outside of a tropical cyclone or hurricane.
10. **Wind waves** are waves generated by local wind and die out after wind drops.
11. **Swells** are long ocean waves created by constant trade winds or distant storms. They can have a long period or interval between crests. They add to the overall height of local wind waves and when coming from a different direction than the local wind they may cause additional steeping of the waves. At sea there are frequently swells from several directions occurring at any one time.
12. **Squalls** are common in the tropics and can have up to 80 knots of wind. They typically show up on radar but not on GRIB files or weather fax charts.

Weatherfax Symbols


 A **Cold Front** is the leading edge of an invading colder air mass, marked by a line with triangles pointing to where it is moving. Cold fronts push in underneath the warmer air ahead of them forcing the warm air upwards and making cloud and areas of heavy rain. A frontal passage at sea will be marked with increased wind speeds, rain and a decrease and shift from SW to NW in the northern hemisphere with frontal passage.


 A **Warm Front** is the leading edge of an invasion of warmer air and is marked by a line with semicircles pointing to where it is moving. The advancing warm air rises over a zone of retreating cooler air, making a cloudbank that slopes forwards from ground level upwards, usually bringing prolonged steady rain.

 An **Occluded Front** A cold-front occlusion occurs when a cold front overtakes a warm front, trapping the original warm air aloft, where it cools, making dense clouds and rain. Try and avoid these areas. When a warm front overtakes a cold front, the process is termed a warm-front occlusion. A warm front overtaking a cold front usually results in dissipation of the front. An occluded front is marked by a line with triangles and semicircles on the same side pointing to where the front is moving.

 A **Stationary Front** is one that has lost its impetus for movement so that neither air mass is making much progress. It is marked by a line with semi circles on one side protruding into the warmer air mass and triangles on the otherside protruding into the cooler air mass.

- - - - - A **Trough** (shown as Trof on some charts) is an elongated area of relatively low pressure typically associated with a cyclonic wind shift. Troughs usually contain weather similar to lows and fronts.

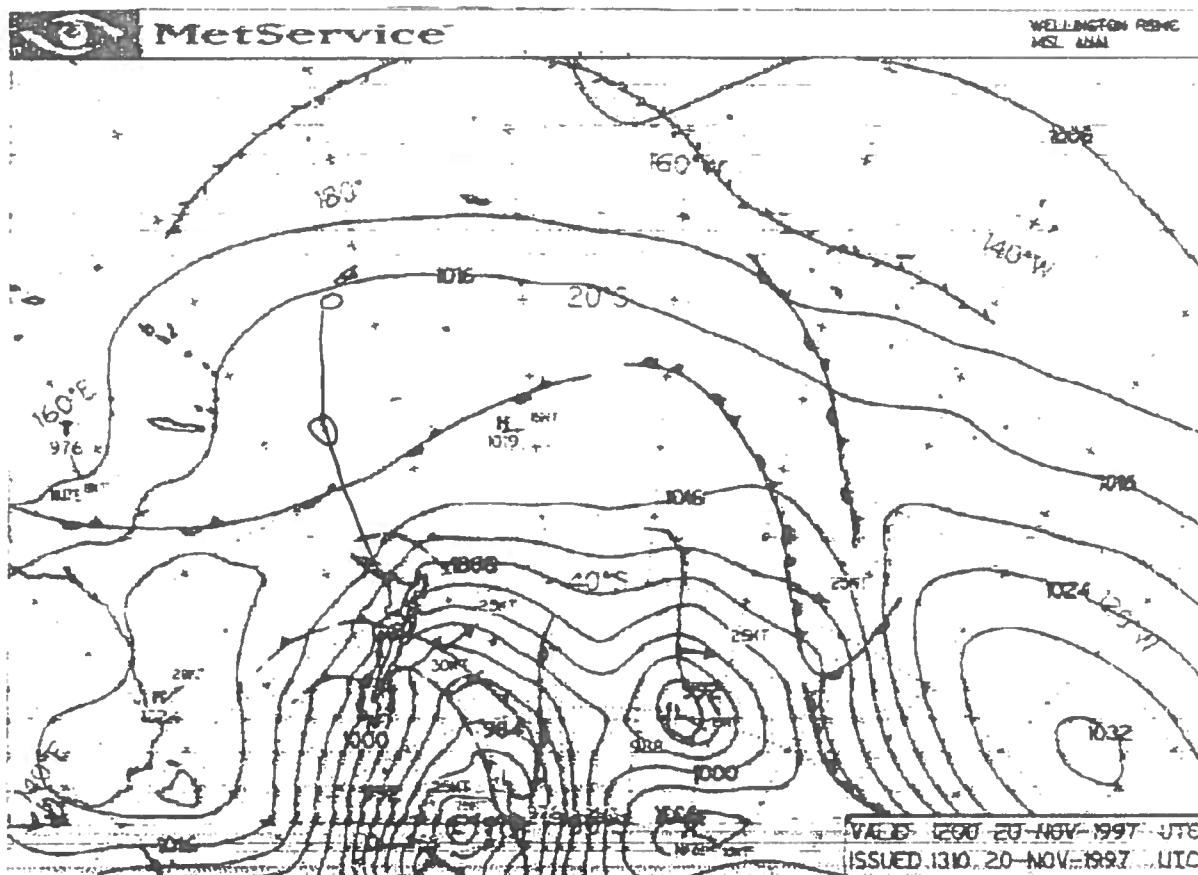
 A **Ridge** is an elongated area of relatively high pressure extending out from the center of the high in a tongue-like shape. The weather in a ridge is an extension of the weather in a high, but an unexpected feature on an approaching ridge especially near land may be a zone of strong wind.

 The **Intertropical Convergence Zones** (ITCZ) snakes across the Pacific and Atlantic between 5 deg and 10 deg north of the equator, between the NE & SE trade wind belts. Convergence zones can be located between highs and lows outside of the inter-tropical area and are typified by convection (thunder and lightning) squalls which may have up to 60+ knots and intense rain. When crossing a convergence zone, the sharper the crossing angle, the shorter the exposure to this unsettled weather will be.

BEAUFORT WEATHER SCALE				
Beaufort Force Scale	Wind Knots	Seas feet	Common name	Description
0	under 1	-	Calm	Sea like mirror
1	1-3	0.25	Light air	Ripples with appearance of scales: no foam crests
2	4-6	0.5-1	Light breeze	Small wavelets; crests of glassy appearance, not breaking
3	7-10	2-3	Gentle breeze	Large wavelets: crests begin to break; scattered whitecaps
4	11-16	3½-5	Moderate breeze	Small waves, becoming longer numerous whitecaps
5	17-21	6-8	Fresh breeze	Moderate waves, taking longer to form, many whitecaps some spray
6	22-27	9½-13	Strong breeze	Larger waves forming; whitecaps everywhere; more spray
7	28-33	13½-19	Near gale	Sa heaps up; white foam from breaking waves begins to be blown in streaks
8	34-40	18-25	Gale	Moderately high waves of greater length; edges of crests begin to break into spindrift; foam is blown in well-marked streaks
9	41-17	23-32	Strong gale	High waves; sea begins to roll; dense streaks of foam; spray may reduce visibility
10	48-55	29-41	Storm	Very high waves with overhanging crests; sea takes white appearance as foam is blown in very dense streaks; rolling is heavy and visibility is reduced
11	56-63	37-52	Violent storm	Exceptionally high waves; sea covered with white foam patches; visibility still more reduced
12	64+	45 +	Hurricane	Air filled with foam; sea completely white with driving spray; visibility greatly reduced

WEATHERFAX

MEAN SEA ANALYSIS FOR SW PACIFIC



Identify these on the weatherfax:

- | | |
|--------------------------|--------------------------|
| 1. Tropical Cyclone Nute | 7. Stationary front |
| 2. High pressure | 8. Low pressure |
| 3. Occluded front | 9. Convergence zone IPCZ |
| 4. Weak cold front | 10. Cold front |
| 5. Warm front | 11. Ridge |
| 6. Trough | |



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email: info@commandersweather.com, website: commandersweather.com
Office Hours: 5AM to 5PM US Eastern Time, 365 days a year

How Commanders' Weather Corporation Delivery Service Works

To start:

Call or email us with your present location, destination, and projected departure date.

Then:

We will monitor the weather for your route and help you find the optimum window to leave. You may call in at no charge to check on a projected departure date, provided you eventually purchase a written departure delivery package (\$99) or written forecast (\$73/\$83) from us.

We will need:

1) your boat name and type of boat , 2) average boat speed, 3) communication details-where to send the forecast and anything we need to stay in touch with you (cell, land email, boat email, SatPhone, fax), 4) billing details (Visa, Master Card, American Express, wire transfer, mailing address)

Shortly before departure:

We will send you your forecast by email or fax, usually the day before you leave. Feel free to call us if you have any questions about the forecast or routing.

Once you are on your way:

We will monitor your progress along the way, provided there is a way for us to contact you in case of weather problems. Depending on the length of your trip, you may want to get additional written or verbal weather forecasts. We will not update you unless you request or unless we see unexpected severe or dangerous weather headed your way.

Finally:

We will bill you at the end of your voyage, or at the end of the month, depending on which comes first.

A written forecast sent by email includes: (5-day text-\$73 or 7 to 8-day text - \$83)

- a) a detailed written summary of the weather pattern indicating where systems are, how they are moving, how the weather pattern is changing and how it will change, how the changes will affect you, areas of squalls, big seas, etc
- b) routing suggestions to best take advantage of the upcoming weather pattern, with safety being the top consideration
- c) a breakdown of wind direction and wind speed at selected time intervals along your projected route - these are usually in 6-hourly increments thru the first 3 to 4 days, then 12-hourly increments up to day 8
- d) consultations with our staff to go over any questions you may have prior to departing.

A written forecast with hand-drawn weather maps sent by email includes: (Regular delivery forecast - \$99 – Transatlantic delivery forecast- \$104)

- a) all the above
- b) 8 days of weather maps - these will have high and low pressure areas, fronts, isobars on them -a good reference to what is discussed in the summary

A verbal forecast includes: (\$39)

- a) a discussion of current weather conditions
- b) a discussion of weather features over the next 3 to 5 days

An outlook or short written forecast includes: (\$39)

- a) a discussion of current weather conditions
- b) a discussion of weather features over the next 3 to 5 days
- c) no detailed breakdown of winds or routing

Subject: Weather 9/16/06

From: "Commanders' Weather" <CommandersWeather@compuserve.com>

To: John Neal and sy "Mahina"
From: Commanders Weather Corporation
Route: Kirkwall, Orkney Islands to Mandol, Norway, as soon as
practical
Prepared: 0600utc Saturday, September 16, 2006

Summary:

- 1) Not unusual for stormy weather in the Orkneys, but some fairly robust storm systems will be affecting the Islands over the next 7 days, so when the opportunity arises to depart, you should go and go quickly
- 2) 1st low is near 55N/23W this morning and will move N towards Iceland
 - a) S-SE winds will be over 20 kts more than under later today and tonight
 - b) unfortunately this will be upwind to Mandol, so will need to wait for the cold front to pass with a wind shift into the SW and W
 - c) it appears the front will arrive around 1400-1800UTC Sunday
- 3) Once you get the wind shift, I suggest you depart
 - a) the good news - the winds will become quite light behind this front, but
 - b) the bad news - the winds will become quite light behind this front and the seas will still be rough, so it could be uncomfortable, but
- 4) Another major low will be moving E across the North Atlantic Sun/Mon
 - a) this developing gale will be near 57-58N/34-35W Sun morning and 56-58N/20-22W Mon morning before heading ENE into central Norway late Wed
 - b) this low will bring increasing SE and possibly ESE winds in the Orkneys and you will be racing the arrival of these stronger headwinds - the further E you are, the longer it will take for the strong winds to arrive. Also, the further E you are, the strong winds will be a bit softer and the wind directions may be more S-SE instead of SE and ESE
 - c) regardless, if you don't depart Sunday afternoon/early evening, then you will have to wait for this gale to pass and then there will be larger/stronger low for late in the week, so you could be stuck in the Orkney's until next weekend
- 5) With departure Sunday afternoon, I have the next SE winds arriving for you late Mon/Mon night
 - a) could go a little S of rhumb line to set-up for a better angle for the SE winds Mon night/Tue morning, but would prefer you to be further along the track then back to the SW and playing for wind angle. Being further E will reduce the gale threat
 - b) I have the cold front arriving about the time of your arrival in Mandol Tuesday afternoon
- 6) There will be a much stronger/larger low during the 2nd half of the week
 - a) this low may have some of the energy from hurricane Gordon, so it could be quite robust
 - b) this low will be near 58-59N/25-30W Wed morning and move thru the northwest UK late Friday
 - c) your winds will increase from this low late Wed/Wed night - the further E you are, the lighter the winds
 - d) this monster low will start to spin down, weaken, and move NNE on Fri/next Sat

Bottom-line, looks like a small opportunity to depart Sunday afternoon, once you get the wind shift into the SW and W and then boogey as quickly/safely as possible for Mandol, otherwise you will be waiting for certain until next weekend

Wind forecasts

Wind directions are TRUE, wind speed in kts, and time is UTC

Sat, Sept 16

12: 160-180/16-22, gust 28

18: 150-170/17-23, gust 30

Weather: Fog/drizzle may lift to some patchy sunshine this afternoon, but clouds, fog, mist, and showers return overnight.

Sun, Sept 17

00: 150-170/17-23, gust 26-28

06: 160-180/16-22

12: 170-190/20-12

18: 220-240/16-10, departing somewhere between 1400 and 1800UTC

Weather: Showers, fog, and mist ending with the wind shift then cloudy to partly cloudy. Seas 6-10 feet, but slowly diminishing

Mon, Sept 18

00: 260-300/10-5

06: 330-010/ 4-7, tending to light/variable

12: Light/variable, becoming 100-130/ 5-10, near 58 45N/01 30E

18: 150-170/10-16, new SE winds will be increasing from W to E across the delivery route

Weather: Partly cloudy to cloudy, maybe some mist or a few showers overnight. Seas 3-5 feet, but increasing quickly overnight

Tue, Sept 19

00: 150-170/16-22

06: 150-170/15-21, much stronger further W in the North Sea

12: 200-230/18-24, squalls 30-35 with the cold front, near Mandol

18: 240-270/16-22

Weather: Mostly cloudy with showers, mist, fog being joined by squalls during the daylight hrs. Some clearing late in the day. Seas 6-9 feet from the S, but falling to 5-7 feet overnight

Wed, Sept 20 - Mandol

00: 240-270/15-21, much lighter in the Harbor

12: 210-180/16-22, departing and heading E

Weather: Partly cloudy to cloudy. Seas 3-6 feet early, but increasing in Mandol, but unlikely you will see much of an increase further E

Thu, Sept 21

00: 170-190/15-30, strongest winds SW Norway and lighter near Gotteburg

12: 180-200/16-24

Weather: Mostly cloudy, chance of showers and mist, especially around Norway. Seas up to 8-12 feet around Mandol and westward. Very stormy in the Orkneys

Fri, Sept 22

00: 170-190/12-18

12: 170-200/ 8-16

Weather: Overnight and early morning mist/fog otherwise cloudy to partly cloudy, chance of a shower or 2.

Best Regards, Ken Campbell

STORM PROCEDURES



Before Departure

1. Hire a **professional weather router** if the potential for dynamic weather conditions exist.
2. Consider taking an **experienced crew person** on passages where you have a higher risk of rough conditions. An extra watch stander should greatly reduce sleep deprivation.
3. Start a **ship's log**.
4. Install a **hot water thermos** for drinks and quick meals.
5. Provision with **easy to prepare meals**. Include freeze dried meals.
6. Keep **high-energy snacks** such as dried fruit and granola bars, readily available.
7. To help **prevent seasickness** purchase Stugeron tablets, Compazine suppositories plus Transderm Scop patches and an electrolyte replacement such as Emergen-C or Berocca.
Free handout: <http://www.mahina.com/seasick/index.html>
8. Fill the bilges with water testing that all **bilge pumps** and high water alarms are working.
9. Securely **stow all items** above and below decks.

When in a Storm - Maintain Responsibility

1. **Be Alert**, continue keeping a 24-hour watch. Rule Five of the International COLREGS makes maintaining a watch a matter of law stating; "Every vessel shall at all times maintain a proper lookout by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and the risk of collision".
2. **Keep the boat sailing comfortably**. A long-distance cruise is not the place to stress your crew, boat, rig and sails by trying to see how hard you can push the boat. Modern sailboats sail best at moderate angles of heel, not with their rails in the water. The best time to reef or change sails is when you first think about it, since waiting for conditions to worsen puts a strain on crew and equipment. This is a serious problem for inexperienced ocean sailors. It is always best to be conservative until you understand how much speed the crew, steering system and boat can handle. You will be surprised that often after reducing sail boat speed is the same and leeway is reduced, resulting in a better course made good.
3. **Get weather information from a professional service**, not other cruisers.
4. Keep an **hourly log** recording wind direction & speed, barometric pressure and position.
5. **Plot your position** on an appropriate paper chart at least every six hours.
6. Ensure **storm sails** are accessible and ready to go.
7. **Transfer fuel** from jerry jugs to top-up main tank if possible.
8. Check bilge and ensure **bilge pumps** are in working order.
9. Charge **batteries**.
10. **Seal all openings that could admit water** into boat: tape plastic bags over dorade vents and chain hawse pipe, secure washboards, place duct tape over water and fuel tank vents, cover engine air intake if it is on deck or in the cockpit.
11. **Consider checking in daily** with position and weather conditions an SSB net.
12. **Monitor the MFD – AIS and Radar**. Leave MFD in reduced visibility or continuously when within 150 miles of land.
13. **Inspect rigging and sails** continuously for signs of wear or anything amiss. Get out of the cockpit, go forward to check the mast and bow.
14. Broadcast **Securité** (see-cure-eh-tay) messages if in fog or reduced visibility or you have storm devices deployed.

SECURITÉ CALL

1. SECURITÉ., SECURITÉ., SECURITÉ.
2. This is the Sailing Yacht _____.
3. Our position is _____.
4. Our course is _____ degrees magnetic and our speed is _____ knots.
5. We are sailing in reduced visibility.
6. Any vessels in the area please respond on Channel 16.

When in a Storm - Maintain Responsibility for all Crew

1. **Study storm location** and track.
2. Keep **crew informed and involved** in the situation, relaying all forecasts and information.
3. **Discuss tactics** and options.
4. **Avoid seasickness.** Take Sturgeron, Compazine or apply Transderm Scope. Seasick crew are a major liability requiring special care.
5. Keep **hot water** in the thermos for drinks or instant soups. Staying hydrated and keeping regular **meal** schedules and healthy **snacks** is of highest importance but is frequently overlooked. Avoid caffeine.
6. Catch up on **sleep.** In storm conditions fatigue and sleep deprivation are your worst enemies. Shorten watches if conditions deteriorate.
7. **Don't overstress boat, sails, rig or steering gear.**

EXCEPTIONAL "ROGUE" WAVES

Exceptional waves are twice the significant wave height and occur every 4 to 5 hours or approximately every 1,000 waves. The largest ever recorded was 123' off the NW tip of Vancouver Island.

Factors contributing to exceptional seas include:

1. Wind opposing current.
2. Shelving, shoaling or promontories.
3. Multiple wave patterns occasionally combining to form a single breaking sea or a set of much larger than the average breaking seas.
4. Amount of fetch.

Examples of places where exceptional waves occur:

- Alaska, British Columbia, Washington, Oregon and California coastline
- Areas affected by the Gulf Stream and Aghallus Currents
- Tasman Sea, Cape Horn, Bay of Biscay, North Sea, southern tip of Norway and Ireland

The problem with exceptional waves is that they are frequently from a different direction than the main wave pattern. If this results in breaking seas hitting your vessel on the beam it may cause damage to dodgers, ports and hatches, and in the worst case even roll your vessel.

In large breaking seas vigilance is important. Safety and seamanship dictate having someone on the helm, alert to alter course; taking the breaking sea on the quarter or bow. In heavy seas you cannot completely rely on an autopilot although it could possibly be used if someone is on lookout. In the event of an exceptional wave they can then turn off the autopilot and steer by hand, thus lessening an exceptional wave's impact or damage. A protected helm position is a valuable asset in these conditions.



STORM TACTICS



There is not one absolute best storm tactic for all types of boats and sea conditions. Larger, faster, deeper-draft boats of modest beam generally handle serious storm conditions best. Centerboarders or boats with excessive beam may tend to roll sooner and stay inverted once rolled. If you're sailing a 30' boat in storm conditions, there is a much higher chance that you will need to employ storm tactics than if you're on a 50' boat.

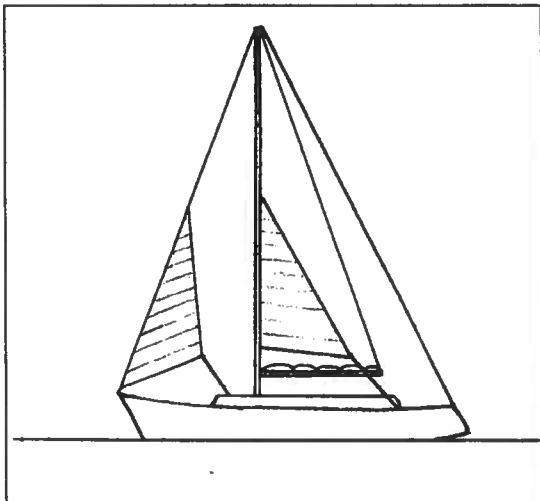
On our Hallberg-Rassy 42 during the 1994 Queen's Birthday Storm we found that with a crew of six we were able to safely run off before the storm under small storm jib, hand steering at 180 miles per day. If we didn't have a full crew, we would have chosen to fore-reach or tow warps or drogue to reduce speed. Jim and Sue Corenman on their Schumaker 50 ft race boat Heart of Gold, were very close to the most intense area of the storm and sailed out of the way at over 200 miles per day, these two very experienced sailors traded off at the wheel and used the autopilot.

The following ten tactics are listed sequentially as the winds and sea increase.

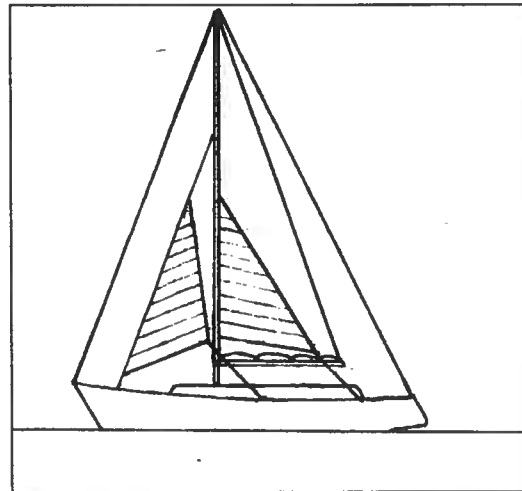
1. Hoist Storm Sails

Method :Hoist dedicated storm sails. If sustained winds over 45 knots are forecast, contact a professional weather router, prepare the storm trysail, and set storm staysail or storm jib. Securely wrap the furling headsail with a spare halyard. If two spare halyards are available, "maypole" the furling sail by wrapping the halyards in opposite directions. Several boats have been dismasted in storms because of headsails unfurling.

Advantages: Reduced heeling, speed, and stress on crew, rig and sails.



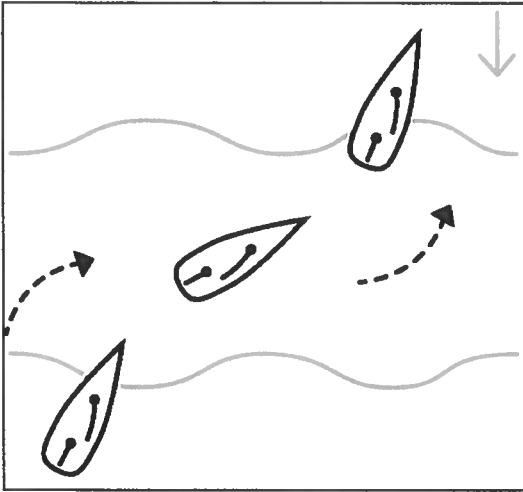
Storm Jib and Trysail – Sloop



Storm Staysail and Trysail – Cutter

Cautions: It's important to keep enough sail area up to maintain 5-6 knots to reduce rolling motion and increased chance of being rolled. This is the time to look at your options; if you don't have enough sea room, start heading further offshore.

2. Fore-Reaching



Method: Triple reefed main or trysail, no headsail and helm secured.

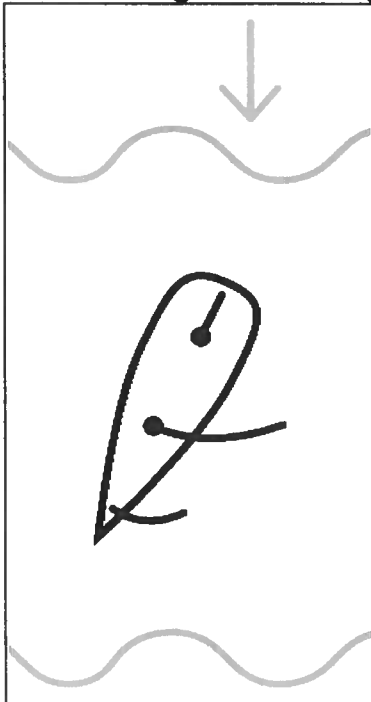
Advantages: The considerable advantages of this tactic include not having to hand steer, lessening exposure time since the boat is going toward, not with the storm, and a surprisingly comfortable ride. Heaving-to in sustained winds over 50 knots (with a back-winded storm headsail and triple reefed main or trysail) places considerable stress on the rig, particularly the windward spreaders. We have found dropping or furling the storm headsail (or furling the genoa), sheeting in the triple-reefed main or trysail and locking the wheel in a close-hauled heading produces a very comfortable 2-3 knots. If the bow falls off to leeward, the main (or trysail) brings it back on course.

In higher winds, this tactic proves quieter and more

comfortable than #4, Heaving-to. As occasional larger seas may push the bow off causing the vessel to lie beam on it's important to have someone maintaining a watch to occasionally adjust the helm.

Caution: It is essential to find out if this tactic will work on your boat as it won't work on many modern, flat-bottomed boats with a short (fore and aft measurement, not draft) keel. Try it in 30 knots with a double-reefed main. If this tactic does not work you can try #7, Close Reaching Under Storm Sails by simply hoisting the storm headsail and hand steering. Another option is #8, Motorsailing under storm trysail or deeply-reefed main.

3. Running or Reaching Off



Method: Sailing downwind on a broad reach or run.

Advantages: Reduces apparent wind speed, (example: Upwind – 30 kt wind + 6 kt boatspeed = 36 kts apparent wind speed, vs. Downwind – 30-6=24 kts apparent). More comfortable motion.

Cautions: You must have sufficient sea room to employ this tactic.

The danger is excessive boat speed which can result in broaching, rolling or pitchpoling. In sustained winds over 50 knots it is prudent to replace a reefed main with a storm trysail as it is independent from the boom. A gybing mainsail, even if secured with a preventer, can result in injury and damage in strong winds.

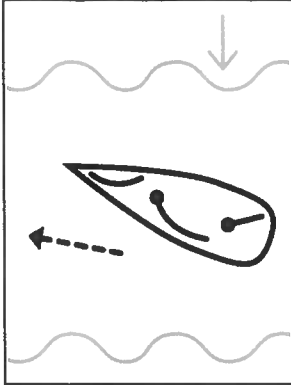
Modern boats handle offwind boat speed better and are generally easier to steer at higher speeds than heavy, full-keeled traditional designs.

Rogue waves are a danger as conditions deteriorate; larger breaking waves coming from a different angle than the predominant direction. In these conditions hand steering and alertness is prudent, requires utmost concentration but is physically demanding. When you're hand steering and hear or see a rogue wave, you're then able to quickly square the stern, stern quarter or bow to the breaking wave. If you're on autopilot or windvane a rogue wave can result in a knock down or

roll over with dismasting.

Most cruisers have little experience or endurance hand-steering, having always relied on autopilots or windvanes. Read *The 1994 Pacific Storm Survey and Rescue in the Pacific* to learn how many sailors had to abandon their vessels as they were relying on autopilots, in severe conditions, and were rolled and dismasted.

4. Heaving-To



Method: To heave-to, set storm sails and sail the boat on a close reach or close hauled. Tack the boat through the wind, backwinding the headsail but do not release the jib sheet. Secure the helm so that the boat does not tack through the eye of the wind or conversely, fall off onto a reach, gaining speed. This allows the boat to take breaking waves 40-60 degrees off the bow, and not on the beam. If breaking waves are present secure the helm with bungee cords so there's some "give" in the steering when the boat is hit by breaking seas. Keep the boat sailing at 2-3 knots, easing the storm trysail (or reefed mainsail) to reduce boat speed if the boat is sailing too fast.

I've demonstrated and practiced heaving-to many times but have only used this technique twice in non-teaching storm conditions but have. In a hurricane off Mexico, after I tried heaving-to, I found a more comfortable

motion by using tactic #7 Close reaching under storm sails which also got me out of the dangerous semi-circle. In 1996 in an intense "squash zone" on the edge of the Roaring Forties we hove-to in 60 knots with 30' seas. After a brief uncomfortable time, we changed to fore-reaching under storm trysail and found it to be a more suitable tactic.

Advantages: Heaving-to is one of the safest storm tactics that doesn't require constant steering, as long as winds are less than 50 knots and seas under 25'-30'. By keeping the boat moving at 1-3 knots hove-to, the chance of broaching out of control or pitchpoling is eliminated. You can choose to heave-to on either tack and if one tack takes you closer to land, choose the other.

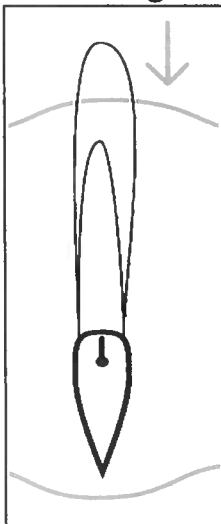
Heaving-to has several advantages over utilizing tactic #10 Deploying a Sea Anchor. These include: less chance of damaging rudder and steering system, better maneuverability to get out of the way of ships, no chance of pulling out cleats or having the sea anchor rode chafe through, smoother motion, no chance of tangling lines around rudder or prop during retrieval. It's also simpler to get underway once storm conditions ease.

Cautions: Many lightweight fin-keel, spade rudder boats may not heave-to, instead continually gybing around in circles. Heaving-to is not appropriate for multihulls. In both these cases consider #2 Fore-reaching or #7 Close Reaching. It is essential to practice heaving-to in progressively stronger winds to see if this tactic works for your boat.

In storm conditions heaving-to has little to no advantage over #3 Fore-reaching but it can be used to slow the boat down for daylight landfall, reefing the main, or to rest.

*If hove-to broadcast a "Securite" message stating your position, and lack of maneuverability every 30 minutes on VHF Channel 16.

5. Towing Warps off the Stern

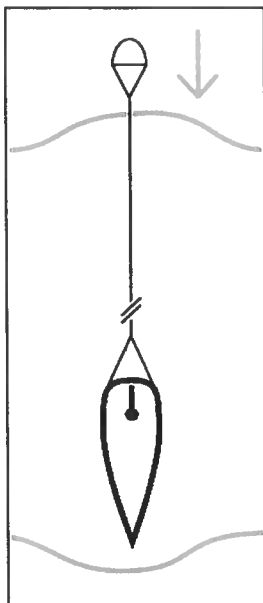


Method: Secure your longest nylon rode (should be 250' to 400') to stern mooring cleats on each side and ease the line out to create a loop behind the boat. Dragging this U-shaped bight reduces sea surface tension, creating a visible "slick" astern which slightly reduces the chance of breaking seas crashing aboard. Towing warps also improves steering response by reducing boat speed. This tactic is effective with multihulls and light to moderate displacement boats. It works well to tow multiple warps, each a different length. On my 27' & 31' boats I've towed as many as three sets of warps in storm conditions with good results. On our current 48' - 38,000 boat, towing warps has almost no effect. Some vessels have also towed tires or chain with anchors but a dedicated drogue (#6) is a better option.

Advantages: Reduces boat speed and the tendency of broaching or pitch-poling from excessive speed. Less chance of steering system damage.

Cautions If the warps are not effectively reducing boat speed there is the danger of pitch-poling or broaching resulting in a roll and dismasting.

6. Towing a Drogue off the Stern



Method: A dedicated drag device (drogue) is towed 300+ feet astern.

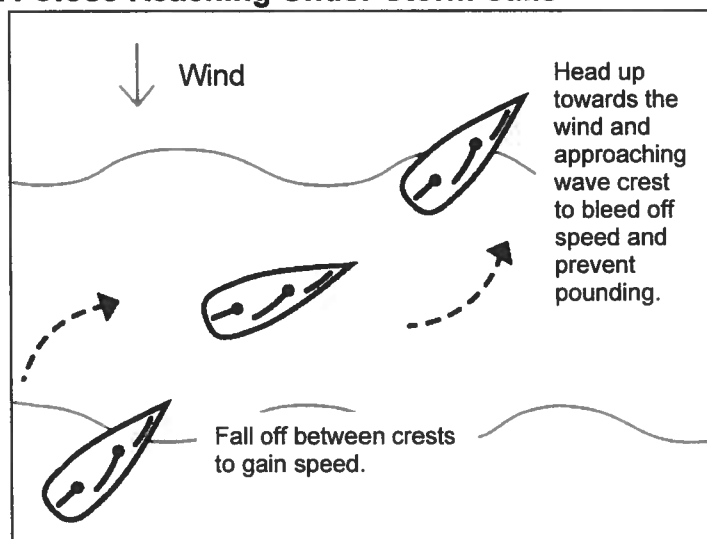
Advantages: A drogue provides more drag and resistance than warps, further reducing boatspeed as conditions deteriorate. Based on our experience, the most versatile and dependable drogues are the Galerider manufactured by Hathaway, Reiser & Raymond and the Fiorentino Shark Drogue. We've also tested the Para-Tech Delta Drogue.

We've found New England Ropes Multi-Plait to be an ideal line for towing a drogue; it's easy to store and does not get hockles or tangles plus we also use the line for anchoring, mooring and towing.

A Jordan Series Drogue utilizes a series of over 100-200 5-inch cones permanently attached to 300' line. Although the series drogue produces sufficient drag, it's a bulky, more expensive and less flexible option.

Cautions: Excess boat speed with either warps or drogue can result in loss of control in which case you will need to recover the drogue and try another tactic. When riding stern-to large breaking seas, boats with aft cockpits are more vulnerable to being pooped than center cockpit designs

7. Close Reaching Under Storm Sails



Method: Actively steer the vessel. Head up towards the wind and approaching wave crest to bleed off speed and prevent pounding, then after passing the crest, fall off to regain speed for the next wave.

Advantages: Eliminates the chance of pitchpoling. Sailing upwind towards the storm reduces your exposure time.

This tactic is an excellent "ultimate storm" option. It has been safely and efficiently used by a majority of race boats in multiple Sydney-Hobart Races.

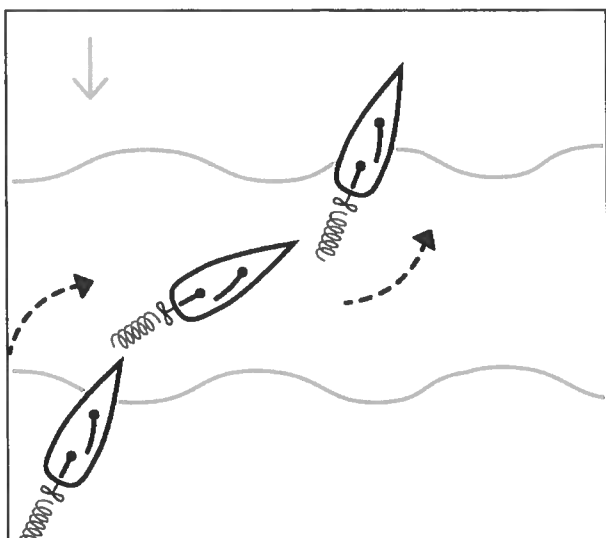
Caution: This tactic requires accurate

upwind steering to avoid the breaking crests. Avoid excessive speed by utilizing a trysail and staysail. Ideal speed should be fast enough for maneuverability, yet not so fast that the yacht goes flying off the top of waves and crashes down into trough. On most boats this will translate into a boat speed of 5-6 knots. A drogue can be towed astern if necessary. This is one of the least comfortable and more difficult tactics. For multihull's a better tactic is #2 Fore-reaching.

8. Motorsailing Slowly to Windward

Method: Sailing close hauled under deeply reefed mainsail or trysail (no headsail) with the motor in gear at low RPM's. Same as #2 Fore-reaching, but with engine running.

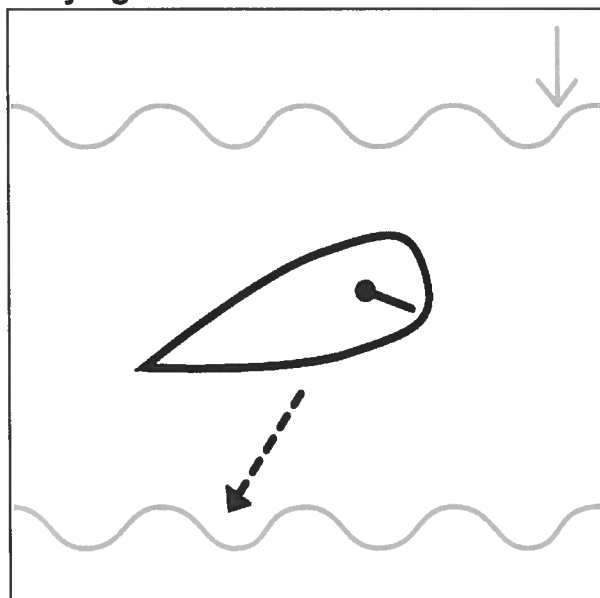
Advantages: Reduces motion, eliminates the chance of broaching or pitchpoling, reduces exposure time to the storm.



This tactic has proven successful for moderate and heavy-displacement sailboats, and powerboats. I've interviewed skippers of the Westsail 43, Por Vida that survived 90 knot winds and 40' seas in the Queen's Birthday Storm and the Roberts 50, Swanhaven which used this tactic in an 80 knot cyclone. Wings, a Serendipity 43 (70's IOR race boat) successfully used this tactic in the Dec '98 N.Z. storm.

Caution: In rough sea conditions any sediment or moisture in the bottom of the fuel tank will get stirred up, blocking fuel filters and causing your engine stop. Prevent water entering the fuel tank through fuel tank vents and avoid lines wrapping around the propeller.

9. Lying A Hull



Method: Drop/furl all sails and secure the helm.

Advantage: Useful only in tropical squalls of short duration where seas are flat.

Caution: Don't lie a hull if seas are higher than the beam of your boat. This is the fastest way to get rolled and dismantled in breaking sea conditions, as was repeatedly evidenced in the '94 Queen's Birthday and December '98 New Zealand storms. .

We've successfully used this tactic in intense tropical squalls when wind speed has gone from 10 to 60 knots then back to 10 knots in 15 minutes. When lying a hull, while singlehanded my Vega 27 in 1975 near the Cook Islands on the edge of a tropical depression, I was rolled to 90 degrees, breaking the rudder. In retrospect forereaching would have been a better tactic.

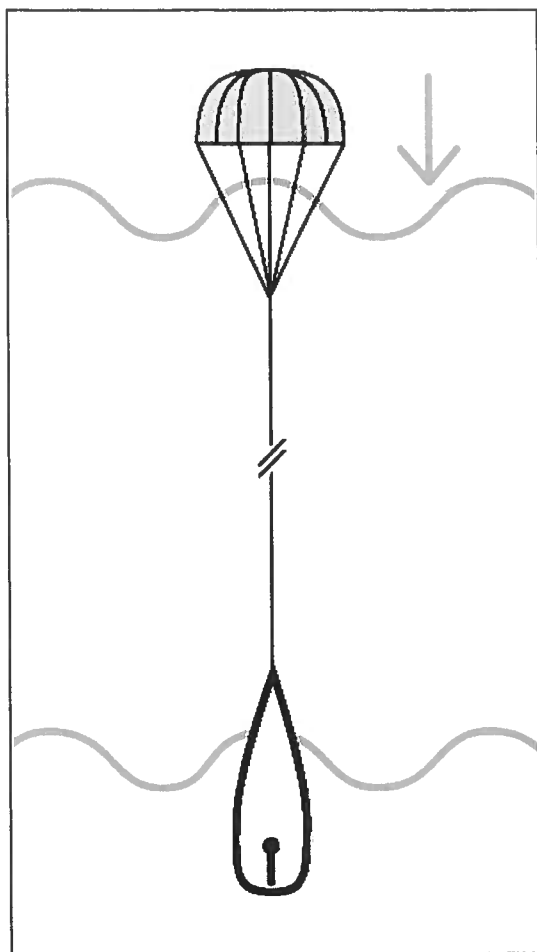
10. Parachute Sea Anchor

Method: Dedicated parachute sea anchor is deployed on a bridle at the bow, with a line 12 to 15 times the boat's overall length. For our 48' boat we'd need 580' of 1" line weighing 150 lbs and presenting considerable bulk.

Advantages: Slightly useful for multi-hulls, power boats or lightweight boats where #2 Fore-reaching or #4 Heaving-to are not safe options. Para-anchors are useful to stabilize the boat if you need to get into the water to effect repairs or to clear lines from the prop.

Cautions: It must be deployed early, as deployment becomes more difficult in strong winds. A sea anchor cannot be easily retrieved until storm conditions have abated.

In winds over 50 knots and in breaking seas over 20' there is and an excellent chance of rudder or steering damage as the boat is being driven backwards. Substantial chafe protection must be installed before the sea anchor is set because of the tremendous loads generated. Four of the five skippers I've spoken with who have deployed sea anchors in true storm conditions, have lost them within hours due to chafe.



When using a parachute sea anchor remember to broadcast a Securite message every 30 minutes on VHF channel 16 stating your position and lack of maneuverability.

Jimmy Cornell, three-time circumnavigator, author of *World Cruising Routes* and founder of The ARC states, "I really believe parachute sea anchors are useless and dangerous."

However, Lin and Larry Pardey are keen proponents of this tactic in their *Storm Tactics Handbook*.

The August 1, 2000 issue of *Practical Sailor* reviews sea anchors and drogues. In the Dec. 1, 2000 issue Steve Dashew, author of *Surviving the Storm* writes, "Practical Sailor readers should be aware that some of the systems discussed have major drawbacks when being used in breaking seas, in particular parachute anchors. During research for *Surviving the Storm*, we debriefed a number of sailors who had used para anchors in severe weather. We did not find one successful story. In every case there was some type of major failure which lead to other difficulties, or to the adoption of other tactics.

Although we've used a parachute sea anchor in teaching situations, we've yet to encounter conditions where we thought it was the best tactic. We don't think it wise or good seamanship to depend on a sea anchor in large breaking sea conditions as attractive

as the concept is (just set the sea anchor, go below and wait out the storm).

Fiorentino, Para-Tech and Shewmon Sea-Anchors are the most common and are constructed of sturdier materials than military surplus cargo parachutes. Although para anchor manufacturers recommend their products for multihulls, at least one major multihull builder, Cantana tells owners not to use them because of potential damage to the steering system.

Additional Information

- **Surviving the Storm-Coastal and Offshore Tactics**, Steve and Linda Dashew, Free download - www.setsail.com. One of the most important and relevant books on storm sailing.
- **The Voyager's Handbook, second edition**, Beth Leonard.
- **The 1993 Pacific Storm Survey**, The Boats Which Survived It, and the Lessons Learned. Booklet by Kim Taylor, Quarry Publishing, Inlet Road, RD 3, Kerikeri, New Zealand.
- **Rescue in the Pacific**, Tony Farrington, International Marine. A true story of disaster and survival in the Force 12 Queen's Birthday Storm.
- **Drag Device Data Base**, book by Victor Shane, Para-Tech Engineering.
- **Pacific Rescue**, Award-winning video produced by TVNZ and National Geographic on the 1994 Queen's Birthday Storm.
- **Storm Tactics Handbook** - Modern Methods of Heaving-to for Survival in Extreme Conditions. Lin and Larry Pardey, Paradise Cay Publications

Resources

- **Hathaway, Reiser & Raymond**, www.hathaways.com, 184 Sselect St., Stamford, CT 06902 Tel 203.324.9581, fax 203.348.3057, www.hathaway.com. Manufacturers of the Galerider drogue.

- **ATN**, www.atninc.com, 1509 SW 1st Avenue, Ft. Lauderdale, FL 33315 Tel 800.874.3671, fax 954.523.2777. Manufacturer of the Gale Sail, a heavy weather sail that sets over the furled headsail.
- **Fiorentino Para-Anchors**, www.Para-Anchor.com, 1048 Irvine Ave. 489, Newport Beach, CA 92660 Tel 800-777-0454, fax 949-722-0454, Manufacturers of quality sea anchors and drogues utilizing a unique stainless steel "para-ring".
- **Para-Tech Engineering Co**, www.seaanchor.com 2117 Horseshoe Trail, Silt, CO 81652; 970.876.0558; www.seaanchor.com. Manufacturers of Para-Tech Sea Anchors and Delta Drogue, and publishers of *Drag Devices Data Base*.



SUMMARY

For storm survival it is essential to develop helming skills and endurance and not constantly rely on an autopilot or windvane. Actively steering a boat requires an alert helmsperson and fatigue is a constant challenge. If survival depends on it, two in-shape sailors on a one hour on, one hour off watch schedule, for 48 or more hours, can steer safely steer a vessel through a storm.

In reality the chances of encountering sustained winds over 35 knots during a circumnavigation are slim if all available forecasting tools are utilized.

Out of Control in A Storm?

If you can't steer the boat without broaching while surfing down the faces of waves, here are your options:

- **Forereach** under trysail or triple reefed main.
- **Tow warp or a drogue** astern to reduce speed. (This can be done under storm trysail or under bare poles)
- **Drop the sails** and continue steering downwind under bare poles.
- **Heave-to**.

Ultimate Storm Tactics

If wind or seas continue to increase to the point that you feel endangered by breaking seas these are your last two options:

- **Turn upwind** and forereach or **close-reach**, steering by hand and bleeding speed off by pointing up into the largest seas. Try and keep boat speed down to 5-6 knots so that you don't pound when punching through the wave crests.
- **Motorsail** upwind under storm trysail or triple reefed main.

SEASICKNESS – AVOIDANCE AND TREATMENT



When day sailing, seasickness goes away once land is reached or the anchor is down. However, on coastal or offshore passages longer than 24 hours preventing or effectively treating seasickness becomes a health and safety matter as left untreated continual seasickness results in incapacitation.

Some level of seasickness is normal and should be expected during the first 1-4 days of an ocean passage, even if you have never been seasick while coastal sailing. Seasickness is caused by sensory conflict and/or stress, both of which result in histamine production. Nausea results when histamine reaches the brain. Some people are more susceptible than others but given the right conditions anyone can become seasick. Having dealt with over 400 seasick sailors over the past forty years, we have become very experienced at prevention and treatment. If you want to avoid seasickness or recover quickly, follow these steps.

The responsibility for the safety of the vessel doesn't go away if you're seasick. A continual watch for hazards, other vessels, navigation and weather monitoring must be maintained. It is VERY important to maintain your full watches no matter how you feel; lying in your bunk is not an option. Helping others get over seasickness as quickly as possible must be the focus and responsibility of all on board. Frequently seasick crew will ask to be left alone, saying they don't feel like drinking or eating anything. Leaving them alone is a mistake as it is important to keep them sipping fluids and regularly eating small amounts.

To avoid or lessen the severity of seasickness the following steps should be taken:

Prior to Sailing

- Avoid coffee, black tea, colas and alcohol (all of which are diuretics) and fatty foods at least 4 - 5 days before the passage.
- Increase your water intake to 2 to 3 liters per day.
- Give each crew member their own 1 liter water bottle labeled with their name.
- Start appropriate seasickness medication at least 24 hours prior to departure: 2-3 grams of Vitamin C, Berocca, Stugeron tablets, Compazine suppositories or TransDerm Scopolamine.
- Prepare everything possible before departure to minimize time required below decks once underway: have meals planned and ready, bunks made up and lee cloths rigged, navigation organized and appropriate clothes laid out.

Once Underway

Whether or not you feel any symptoms of seasickness, it is essential to:

- Maintain a steady fluid intake of one liter per 2-3 hour watch ensuring a total of 2-3 liters per day.
- As soon as seasick symptoms appear (mild headache, queasiness, sweating, drowsiness, depression) sensory conflict has caused histamine production to start and a more disciplined response is required.
- Add Emer'gen-C (available in health food stores), Berocca or a similar vitamin-mineral drink mix containing potassium and electrolyte replacement minerals to your drink bottle. The electrolyte replacement helps your cells absorb fluid more quickly and completely. Gatorade and similar sports drinks lack vitamin C which counteracts histamine production.

- Eat small amounts of food on a regular basis: crackers, cookies, crystallized ginger, tinned fruit or hard candies. Bananas provide potassium and are an excellent first choice if available.

Effective Seasick Medication

- Stugeron (cinnarizine) 15 & 75 mg tablets are unavailable in the US, but are readily available in many countries including the UK or from www.CanadaDrugsOnline.com. Stugeron, an over-the-counter antihistamine has consistently proven to be one the most effective anti-seasick medications causing less drowsiness than other antihistamines.
- Compazine (prochlorperazine) 5, 10 or 25 mg suppositories (not oral) have proven to be the most effective prescription anti-nausea and anti-anxiety medication that importantly does not cause drowsiness. As anxiety can cause nausea and since Compazine treats both it is an important drug to carry aboard. Suppositories are far more effective than tablets once vomiting has started.
- Transderm Scopolamine 1.5 mg patches may work when no other drug does, but one **MUST** first test this drug out on land as documented side effects include drowsiness, blurred vision, disorientation, anxiety, hallucinations and psychosis. Expect major personality changes and serious drowsiness if Scopolamine is used more than three days.

CAUTION! With any drug, prescription or OTC, there are published side effects. Do your homework; ask your physician and pharmacist and research each drug. If you have heart, blood pressure or prostate problems your physician may not be able to prescribe some of these drugs. Test each anti-seasickness drug ashore well before departure to check for side effects.

Feeling Queasy? If so:

- Take the helm and steer the boat, focusing on the horizon. If the boat is overpowered, reduce sail. If you are sailing close-hauled, ease sheets and fall off.
- When going below, first take your foulies off in the cockpit rather than below decks. Minimize time working below if possible. The faster you either get back on deck or lie down the better you'll feel. Lying down prevents histamine from reaching the brain, decreasing nausea.
- Avoid lying down in your foulies for an extended period of time to lessen the chance of hyperthermia.
- Maintain medications and review whether additional or different medications are required.

Going to Vomit? If so:

- Vomit into a 2 liter plastic container with tight-fitting lid that you can use on deck and below.
- To avoid a possible overboard situation don't lean over the lifelines to vomit; use a container.
- Most people feel considerably better after vomiting, but it is essential to maintain a steady fluid-electrolyte intake. Take small sips, stay hydrated, and keep your blood sugar level up. This is helpful for avoiding Sopsite syndrome which will make you feel like sleeping and not wanting to eat or drink. Giving in to Sopsite puts you at risk of prolonged dehydration, which can lead to shock.
- Prolonged vomiting causes dehydration surprisingly quickly, hypothermia (even in the tropics) anxiety, confusion, depression and shock. Once in shock, an enema or IV is the next step to rehydration and your survival.

After departure, coastal wave refraction and associated choppiness should be followed by more regular ocean swells, so do not be initially discouraged by seasickness. In almost all cases sailors recover from seasickness within 1-4 days if they follow the above advice.

Inherent in accepting and mastering these steps is realizing your responsibility and doing everything within your power to get over or help crew mates get over seasickness as quickly as possible. No one wants to be a liability aboard. In most cases, those that have come through appreciate that managing seasickness effectively is a key to unlocking the pleasures of blue water sailing.

V1.14

DEALING WITH ANXIETY AND FEARS IN STORM CONDITIONS



Although rarely given much thought when planning a cruise, the psychological challenges of a major life change that leaving familiar surroundings for a life of cruising entails are often the most difficult adjustment that new cruisers have to deal with.

What is Anxiety?

Anxiety refers to an overwhelming sense of apprehension or fearfulness and can produce both psychological and physical symptoms. Anxiety can be brought on by many factors and few situations can provide such a wealth of stresses as an ocean passage by sailboat.

Anxiety does serve a purpose and mild levels of anxiety may help to make a sailor more cautious and result in increased motivation to focus on the task, e.g. to get the boat safely to the next port.

Overwhelming anxiety, however, tends to cause an individual to focus inwardly and away from the task at hand. An overly anxious state can lead one's focus and attention inwardly or onto one specific task, losing sight of the "big picture", possibly endangering the safety of the boat and crew.

On the far end of the anxiety continuum, panic refers to a sudden, overwhelming anxiety of such intensity that it produces feelings of stark terror. Panic states tend to be much more debilitating; rational thought is often suspended and people may freeze or react in an unpredictable or self-endangering manner. Common examples are in storm conditions when people ask to be taken off a perfectly seaworthy boat or when they lie huddled below decks, praying for the storm to be over instead of actively sailing their boat.

What Causes Anxiety?

- **Medical and physical conditions** including seasickness, dehydration, fatigue, low blood sugar, PMS, menopausal symptoms, recent injuries, diabetes, certain cardiac conditions, asthma, thyroid and parathyroid disorders and some systemic infections can produce feelings of anxiety.
- Several **medications** including caffeine, nicotine, some anti-seasickness medications including scopolamine, antihypertensives (medications for high blood pressure), theophylline (a bronchodilator used to treat asthma) can aggravate feelings of anxiety.
- **Psychological stresses** of a major lifestyle change, leaving family and friends, stresses in a relationship, previous negative experiences as well as negative thoughts (doubting one's own abilities or perceived limited or lack of control of a situation) can increase stress reactions. People who are non-swimmers or are uncomfortable on the water should learn to swim proficiently if they want to go cruising.
- Our experience at sea is that **chronic worriers** are more prone to anxiety reactions and have greater problems relaxing at sea than those individuals who are less prone to introspection and worry.
- We have found ocean passage making to be a great **intensifier of emotions**. If you are dealing with depression, anxiety, resentment and anger, you may find that being out of touch with familiar surroundings to be frightening and unfulfilling. Traveling by RV or sailing in coastal waters close to home might be a safer option than long distance voyaging. If you

are basically a happy, outgoing, mentally and socially well-adjusted person, you will probably find passage making exciting and fulfilling.

Anxiety Producing Times

Everyone, no matter how experienced, experiences anxiety about cruising. If you realize this is normal and know when to expect it and how to deal with it you will be better prepared for cruising.

Some instances where anxiety should be expected are:

- When it is **time to leave the security** of your home port, just after your bon voyage party. Press onward, don't stop now. You didn't spend all of this time and energy to change your mind now!
- During your **first night offshore** at sea. Since you will have previously made an offshore shakedown passage of several days before departing on your long-term cruise, this won't be the end of the world. In a few hours the sun will rise again!
- During and after your first **rough offshore passage**. A fair number of boats end up for sale or on the back of a truck after the owner's first exposure to rough water. All of the chartering and coastal cruising in the world still won't prepare you for the adjustments required for ocean passagemaking.
- When you're at the **furthest point from land**. This is a common and serious place to experience an anxiety attack. Expect this and be ready for it! Confidence in your well-prepared boat and in your seamanship and navigation skills (gathered during your ocean shakedown trip) would help lessen this anxiety. Many cruisers find that having a radio aboard and checking into maritime nets with daily position reports helps reduce anxiety. It is scary to be in the middle of the ocean and to realize that you are totally responsible for making the boat, cruise, crew or relationship and passage work, and that in most instances there is no one that can come and assist you.

Symptoms of Anxiety

Signs of anxiety in sailors include irritability or distractibility, being overly talkative or becoming withdrawn, stalling, e.g., putting off departure, rapid breathing or hyperventilation, "wild-eyed" look or avoiding eye contact.

Dealing with Anxiety

- **Talk** about your anxiety with your partner. Do your homework: take sailing lessons and navigation lessons, (swimming lessons too, if needed), spend several months living aboard before departing.
- Make sure that you stay **healthy**, hydrated and watch your diet and exercise.
- Take an extra experienced **crew person** aboard for your first passage or for rough passages so that fatigue and sleep deprivation don't increase your anxiety level.
- Make sure that you have at least 20 **Compazine** suppositories. From our experience of dealing with hundreds of first-time voyagers, this is by far the best seasickness medication and it is also has an anti-anxiety effect.
- Occasionally, a mild sedative may be necessary. All should be used sporadically and with close supervision. **Xanax** 0.5 mg is similar to Valium and may have fewer side effects. It is taken twice a day for no more than a week.

