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1. WEATHER

Rally Weather Forecasts

On designated stages during the rally a weather forecast is sent to the fleet via email. A professional meteorologist produces the forecast specifically for the fleet and gives a 24 hour forecast with a further 24 hours outlook. It is written based on a map defining the rally zones (sea areas) along the route, and uses a number of abbreviations. A typical report, with abbreviations explained, is detailed in the example opposite. Further details regarding the daily weather report and map with sea areas will be given at the skippers briefing prior to the start. The weather forecast is sent via email. Yacht email systems using a 'whitelist' (e.g. Winlink) should add rallycontrol@worldcruising.com and warc2015@worldcruisingevents.com

Skippers are reminded that the rally weather forecast is not the only weather forecast available for the route, and should not be relied upon as such. The forecast should be read alongside other sources of weather information including weatherfax, Navtex, radio nets, Inmarsat, and subscription forecasting/routeing, to build a picture of the likely weather to be experienced.

A useful practice before the start of the rally is to begin to understand the general weather patterns on the route, how they form and the likely conditions that can be expected. This can be achieved by reading the many books available on the subject, listening to forecasts and using internet weather sites to follow current weather patterns.

It is also good practice to have a reasonable understanding of meteorology to make best use of the information obtained from verbal or pictorial forecasts.

An up to date weather forecast plus further information, including details of the daily radio net, weather forecast times and departure/arrival details, is distributed at the skipper's briefing prior to the start of the rally.

Rally Times

Rally times will be given in UTC unless specified. The forecast opposite is in local time (Fiji)

Abbreviations used in email rally weather forecasts

N	North
E	East
S	South
W	West
altho	although
ave	average
&	and
becmng	becoming
bkn	broken
cntrl	central
cld	cloud
30/11	date in day/month
elswhr	elsewhere
FX	forecast
frnt	front
hr	hours
hvy	heavy
isold	isolated
ltr	later
posn	position
pos	possible
sct	scattered
shwrs	showers
squls	squalls
sqly	squally
synop	synopsis
thru	through
tom	tomorrow
tsms	thunderstorms
tndry	thundery
0000	time in hours/minutes
tonit	tonight
UTC	universal time (GMT)
vrbl	variable
w/	with
wkng	weakening
WX	weather

Sample rally weather forecast

Date of issue

Forecast for World ARC Rally
Leg Musket Cove, Fiji to Tanna, Vanuatu.

Issued at 0700hr 9th July 2012 (Fiji Time)

Synopsys

Remainder of Monday 9th July 2012

A ridge of high pressure extends from a high pressure centre which is slowly moving eastward at around 40S. This ridge is producing fresh to strong SE winds over the region.

24 hour forecast with wind, sea state and weather

Rhumb-line Musket Cove to Tanna

Wind: SE (140-120deg) at 18-25kt (ave)

Wind waves: increasing to 11ft (ave)

Swell waves: from 190deg at 5-7ft (ave) [9sec period]

Weather: Cloudy with some isolated squally showers.

Tuesday 10th July 2012

The ridge of high pressure is expected to be near maximum intensity today.

Rhumb-line Musket Cove to Tanna

Wind: E-SE (130-110deg) at 20-25kt (ave) throughout
Wind waves: up to 11ft (ave)
Swell waves: from 170deg at 6-8ft (ave) [9sec].

Weather: Cloudy at times with an isolated squally shower or two.

48 hour synopsis with information on weather systems

Wednesday 11th July 2012

High pressure ridge is expected to reach maximum intensity today.

Rhumb-line Musket Cove to Tanna

Wind: E-SE (120-100deg) at 22-28kt (ave) throughout.

Wind waves: up to 12ft (ave) at times.

Swell waves: from 160deg at 6-8ft (ave) [8sec period]

Weather: Partly cloudy with the chance of a squally shower.

Notes:

1. hr = Local Time (Fiji time)
2. Wind gusts can be up to 50% more than the average wind speed (can be greater than 50% in showers and thunderstorms over short time scales)
3. Squally and erratic winds (and seas) may occur with showers and thunderstorms over short time periods.
4. Waves can be higher/lower than the forecast average (the average is actually the significant wave height which is the average height of the highest one third of all waves). One wave in roughly every 2000th wave can be twice the average height.

Weather Information

At sea, the widest range of weather information is available via SSB; with radio nets, voice forecasts and data via weatherfax/RTTY or by email with a PACTOR modem.

With sat-phone, the main choices for forecasts are either calling a forecaster or routing service, or downloading text or GRIB data via email.

Navtex will work to around 270NM from shore.

HF SITOR (RADIOTELEX) Broadcasts

RadioTelex (RTTY) is a text based system transmitted via HF radio and is similar to NAVTEX but with a far greater range.

USA/Atlantic/Pacific NOAA Stations Chesapeake NMN, New Orleans NMG, Pt Reyes NMC, Kodiak NOJ, Honolulu NMO and Guam NRV
www.nws.noaa.gov/om/marine/hfsitor.htm

South Africa Cape Town ZSC

Brazil PWZ-33

SSB Voice Forecasts

USA/Atlantic/Pacific NOAA Stations Chesapeake NMN, New Orleans NMG, Pt Reyes NMC, Kodiak NOJ, Honolulu NMO and Guam NRV
www.nws.noaa.gov/om/marine/hfvoice.htm

French Polynesia Papeete TTT

Fiji Suva Radio 3DP

Tonga Nukualofa A3A

New Zealand/Pacific Taupo Maritime Radio ZLM

Australia/Pacific/Indian Oceans VMC and VMW
www.bom.gov.au/marine/radio-sat/marine-weather-hf-radio.shtml

South Indian Ocean Brunei Bay Radio V8V2222
www.bruneibay.net

Mauritius Port Louis 3BB

Reunion COSRU MRCC

South Africa Cape Town ZSC, Durban ZSD, Port Elizabeth ZSQ

Brazil PWZ-33 RD (J2D)

Voice forecasts can also be obtained for a fee by phoning a forecaster and giving your position. While this service is relatively expensive, the advantage of speaking to a forecaster is that he may just have received updated information in his weather model, relative to your passage or route. See Weather Subscription Service for some suggestions.

Weather Fax

The latest schedules can be downloaded from www.nws.noaa.gov/om/marine/rfax.pdf. This document will also explain how to obtain US weather charts via email. Stations include:

USA NMC KVM NMG

Australia VMW and VMC

Brazil PWZ

When receiving weatherfax via SSB, use USB mode and tune 1.9kHz lower (eg for 3855kHz tune to 3853.1kHz)

SSB Time Signal Stations

WWV transmits 24 hours a day on 2.5, 5, 10, 15, and 20MHz and gives hourly storm warnings for the North Atlantic Ocean and Northeast Pacific.

www.nist.gov/pml/div688/grp40/www.cfm

WWVH transmits on the same frequencies, and gives hourly storm warnings for the West Pacific, East Pacific, South Pacific and North Pacific.

<http://tf.nist.gov/stations/wwwh.htm>

A full list of SSB voice and data forecasts can be found in the [Admiralty List of Radio Signals](#) NP281/1 (Europe, Africa and Asia) and NP281/2 (Americas, Far East and Oceania).

GRIB Files

Free GRIB files with viewers or for overlay on an electronic chart:

UGRIB www.gribus.com

Zygrib www.zygrib.org

Saildocs www.saildocs.com

Subscription GRIB services include:

Theyr www.theyr.com

Most electronic charting systems will allow GRIB files to be displayed on the charts.



Saildocs GRIB data overlaid on electronic chart

Weather Subscription Services

Most are provided on a subscription basis with users choosing to have weather emails every day, every 3 or every 5 days, and selecting the information to be included in the forecast such as wave heights and pressure. These can be tailored forecasts for specific routes, or forecast data for a sea area. Forecasts can be sent in a variety of ways: plain text e-mails; small png graphics for quick download; or GRIB files to integrate with navigation software.

Chris Tibbs www.sailing-weather.com
Simon Keeling www.weatherweb.net
Ken McKinley www.locusweather.com
Ken Campbell www.commandersweather.com
Weather Routing Inc www.wriwx.com
Chris Parker www.mwxc.com
Meeno Schrader www.wetterwelt.de
ShipCom www.shipcom.com
Buoy Weather www.buoyweather.com

Maxsea www.maxsea-shop.co.uk and RayTech www.raymarine.com forecasts are free once the charting software has been purchased, but of course when you go online to collect the forecast you are in fact paying, which in the case of subscription emails can make for quite expensive forecasts.

Free Weather Websites

www.yachtcom.info/weather lots of useful information on how to receive weather information via SSB, including RTTY, from World Cruising supporter YachtCom.

www.franksweather.co.uk lots of free links to download, plus useful explanations.

www.weather.mailasail.com Lots of information and links, including GRIB data, from World Cruising supporter MailASail.

www.weathercharts.org links to world weather forecast information, satellite images etc. Page 1 for North Atlantic and Europe, page 2 for world sites.

www.passageweather.com free forecasts for sea areas worldwide, based on a variety of sources.

www.wetterzentrale.de/topkarten/tnkf.html central database of worldwide weather information and satellite maps. In German.

<http://ogimet.com/index.phtml.en> Weather maps, data forecasts and directory of information for global weather. In Spanish and English.

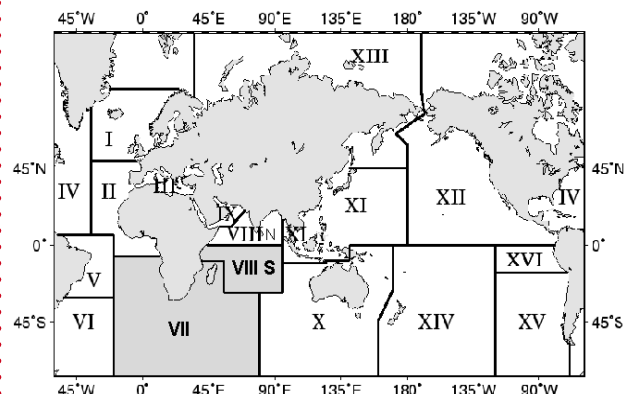
www.sat.dundee.ac.uk Register for free access to satellite images.

Selected National Meteorological Offices

USA www.nws.noaa.gov/om/marine/home.htm
French Polynesia www.meteo.pf
New Zealand www.metservice.com/marine/high-seas/index
Australia www.bom.gov.au/marine
Mauritius www.metservice.intnet.mu/
South Africa www.sanho.co.za weathersa.co.za
Brazil www.mar.mil.br/dhn/chm/meteo/index.htm

GMDSS Inmarsat-C SafetyNET

Although most leisure boats do not use Inmarsat-C, it is worth mentioning that twice daily high seas bulletins are provided for worldwide sea areas. For more information, see <http://weather.gmdss.org>



Chris Tibbs' Notes on Weather Charts

Close to the equator, mean sea level pressure charts are of limited use as changes in pressure are small. In addition the coriolis force, from the spinning earth, is minimal (zero at the equator) so wind tends to blow from high to low pressure. It is also the reason that hurricanes do not develop near the equator. If available, charts showing stream line analysis are more accurate when sailing within about 10° or 15° of the equator. Some stream line analysis charts are available from the US and also Australia when west of the date line.

It is also important to remember that on a chart showing surface pressure the further we are from the poles the higher the wind strength for a given isobar spacing. For example; isobar spacing at 60° indicating 18 knots of wind would, for the same spacing, be 24 knots at 40°, and 45 knots at 20°. Therefore a depression in the tropics will give stronger winds than the same size in higher latitudes.

Tropical Weather Notes

by Chris Tibbs www.sailing-weather.com

The Pacific is a big ocean, and although the route is predominantly trade winds, there will be different conditions as we move from the northern to southern hemisphere across the doldrums, and into the trade wind belt. Whilst the route avoids tropical storm seasons and the majority of voyages across the Pacific avoid bad weather altogether, there are a number of things to watch out for.

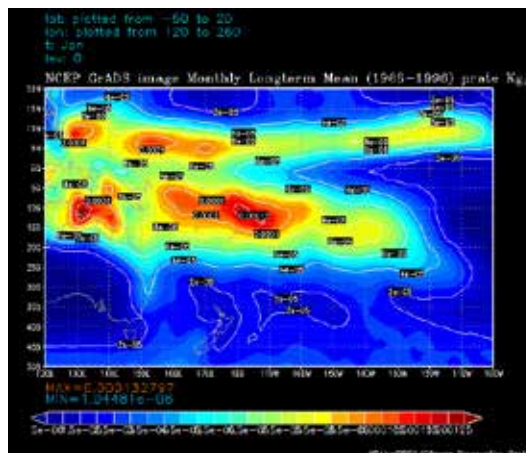
Inter Tropical Convergence Zone

This ITCZ is historically known as the Doldrums, this is the thermal equator of the world. It is a band of low-pressure between the NE trade winds of the northern hemisphere and the SE trade winds of the southern. These winds converge (hence the term ITCZ), and between them is a band of light wind and often-towering cumulonimbus clouds. This is the squalls and calms of the doldrums. The ITCZ follows the sun moving south in the Southern Hemisphere summer (although in the E Pacific it stays N of the equator) and north in the winter. We should cross the ITCZ between Panama and Ecuador and thereafter we will stay south of it.

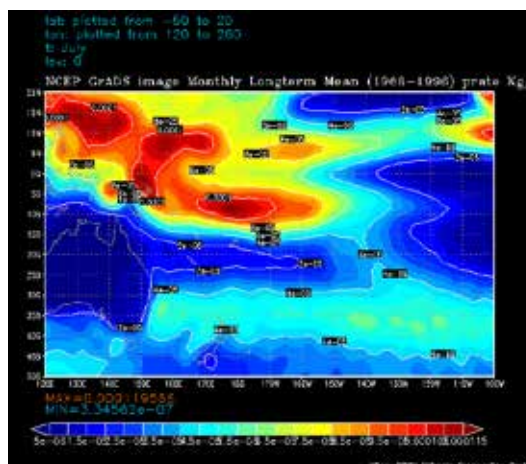
However in the South Pacific there is an area termed the **South Pacific Convergence Zone (SPCZ)**. This is a persistent elongated or sausage shaped zone of low-level convergence that extends from 140°E near the equator to about 120°W at 30°S. It is most active in the summer months (S Hemisphere summer) however it is closer to the ITCZ. In the winter months it is more transient and can affect the western side of the Pacific from near the Solomon Islands to Fiji, Samoa, Tonga and further southeast. It is caused by convergence between the easterly trade winds near the equator and south easterly trade winds from further south. It is sometimes termed a monsoon trough, or trade wind convergence. The position will move with the ENSO cycle (see section on El Niño).

There can be some strong winds if the SPCZ interacts with other systems. It is often marked on synoptic charts and mentioned in W Pacific forecasts; it may also be referred to as the Trade wind front.

The diagrams below show the SPCZ and the position of the ITCZ.



Average January positions



Average July positions

The bright colours show rainfall rates and indicate areas of convection.

High Pressure

The winds of the Pacific, south of the equator, are driven by the semi-permanent sub tropical High-pressure area of the south Pacific. Like the Azores (Bermudan) high of the North Atlantic all large ocean basins have a semi permanent high-pressure area in the sub tropical belt near 30° north and south of the equator, and are part of the global circulation patterns of the earth.

In the South Pacific, during the summer months, the high pressure moves a little south to be at about 35°S and 100°W. As we move into the southern winter the high drifts north maintaining a ridge towards Australia. This is an average position and is situated south of the Galapagos Islands. This high drives the trade winds of the

South Pacific giving figures of 10-20 knots at 5-15°S and 15-25 knots at 15-25°S.

The speed of the trade winds can vary depending on the intensity and position of the high pressure. This will also depend on the ENSO cycle.

El Niño and La Niña (ENSO cycle)

There is much talk of El Niño and La Niña as it does have an effect around the world. It is a seesawing pattern that takes several years to go back and forth. It can be measured by the Southern Oscillation Index (SOI), which measures the air pressure difference between Tahiti and Darwin. When the SOI is negative (high pressure Darwin low Tahiti) we are in the El Niño phase. For the voyage across the Pacific the El Niño phase gives generally weaker trade winds, and La Niña stronger. There is also a change in the position of the ITCZ and SPCZ, both moving N in an El Niño year however high rainfall moves into the central Pacific region.

Predictions are inconclusive as to which way the pattern will go in 2015, this however implies that it is unlikely to be strong one way or the other.

Dangers

Most of the time the South Pacific is placid with little to worry about but we cannot ignore the forecasts, as there may be changes to the normal pattern.

Hurricanes

In the South Pacific they are called cyclones or tropical cyclones

The season runs from mid November to April generally from 5-30°S and extends from Australia to Tahiti or occasionally the Marquesas. By the end of March the Marquesas are considered to be safe from tropical cyclone activity. Further west in Fiji the tropical cyclone season extends to the end of April.

The maximum number of expected cyclones is during February. There has been a general increase over the years; however this may be due to the increased detection rate brought about by satellite pictures rather than an overall increase.

Squalls and Thunderstorms

Squalls with gale force gusts ahead of the rainfall are possible throughout the tropics. They are likely to get more numerous as we get west particularly in the area of the SPCZ.

Tropical Lows

Although we will be outside the Cyclone season occasionally a depression will form in the tropics (most likely May or June). These can rapidly deepen as they move into the sub tropics and generate storm force winds. One in June 1994 started between Vanuatu and Fiji deepened rapidly as it moved south (described as a meteorological “Bomb” by the New Zealand Met Service). This storm decimated the cruising fleet sailing between NZ and the Pacific Islands causing the loss of 3 lives and 7 boats. Anecdotal evidence indicates around 2-4 depressions forming in the tropics during a year, but very few deepen to the same extent.

In the tropics (within 23° of the equator) there is a diurnal pressure change of around 2mb. This gives a maximum pressure at 1000 and 2200 local sun time, and a minimum at 0400 and 1600. Different places will vary slightly, however it is worth recording barometer pressures. Any falls of pressure outside of the normal diurnal pressure changes indicate a change. It may be just a weakening of the high-pressure area, but a significant change indicates the formation of a depression and should be taken seriously.

Currents

From the Galapagos Islands to Australia the current is favourable however the islands will often deflect the current and will always accelerate it. Occasionally the current reverses if the trades fail. This is the south equatorial current and flows in a westerly or southwesterly direction (slightly away from the equator).

Swell

For the most part it is a function of the strength of the trade winds and can make some anchorages uncomfortable. Deep depressions away from the area will propagate northwards to cause an uncomfortable swell that is difficult to predict. Swell and wave charts are available on the internet and some grib files will show wave heights.

When anchoring, comfort wise, there is a large difference between the islands fringed by reefs, which will protect anchorages, and the islands that are not protected.

2. TROPICAL SAILING

Tropical Navigation

While sailing in coastal waters in Europe, the US and to some extent Australasia, skippers become accustomed to a particular type of navigation. The quality and accuracy of the charts are good, with corrections frequently and easily available. Pilot books offer wide and detailed information on the places that are frequently visited. This makes day and overnight sailing easier and the experience more enjoyable.

However, the attraction of sailing in many other parts of the world arises from their remoteness and tranquillity. For this, the cost is often less certainty and accuracy in published charts and pilots. Cruising in these places therefore requires additional care.

Navigating in the Shallows

Often channels will be unmarked by buoys or beacons and you may have to find your own route through. One of the dangers in navigating in shallower water, particularly in the mid

Pacific, is that steep coral heads (bommies) can rise up quickly from the sea bed. This will be undetectable by vertical sonar and you may not discover them until damage has been done.

A solution could be to fit forward looking sonar to give reliable warning, regardless of the time of day and weather conditions. However, simple, practical steps can help pilotage through these difficult areas.

Height

If you are navigating a tricky passage, try to get a 'spotter' as high up in the boat as possible as they will be able to see the coral much more clearly. This may mean a trip part-way up the mast!

Sunglasses

Polarized sun glasses is essential in shallow or coral waters. They cut-out reflected light, making it easier to see relative depths.

Colour

Depths of coral and the shape of the feature can usually be estimated by colour. Coral that appears brown in appearance is likely to be less than 1m. Below that, coral will be light green at

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2m and the shade will get darker with depth. In clear azure water, the depths are often greater than they look but this is probably a helpful illusion to deal with.

Timing

Try to make approaches when the sun is high and the skies clear - between 0900 and 1500, or 1300 for approaches westwards. Low sun makes identifying reefs much harder.

Speed

Don't forget that reducing speed will give greater opportunity to appreciate the depths, to alter course in good time, and ultimately reduce the chance of damage if mistakes are made.

Lagoon Entrances

Thought should always be given to the time at which one enters or exits a lagoon. Information can be found in Pilots but always be cautious. Passes are often constricted and therefore tidal currents are stronger than one might expect. Generally speaking, but more valid for smaller lagoons, surf will break over the reefs and fill up the lagoon. This will create a current out of the lagoon, snubbing the flood and accelerating the ebb. It may also mean that an anticipated slack water is not so.

The accelerated flows will probably create considerable disturbance as it meets with the ocean particularly, as you would expect, if the wind is in opposition. The standing waves, occasionally breaking, should be treated respectfully - leave it a bit longer on the transit until you turn to pick up a course.

Electronic Aids

Electronic aids to navigation can be invaluable, but their limitations should always be remembered and, where possible, confirmed with current (eyeball or radar) observations. GPS



accuracy in relation to charts is not always exact. If fitted to a yacht, the overlay of radar information on top of an electronic chart will help to confirm your approach. (Remember to check GPS offset).

Working with a GPS and chart will be most accurate when the GPS position has been derived using the same system which determined chart positions. If cockpit mounted consider the visibility of the screen in sunlight.

Tropical Sailing Tips

Sailing in the tropics during the safe season can be highly enjoyable as the weather conditions are generally benign and, especially on long passages, one can have days on end of trouble-free sailing. However, for sailors arriving from a temperate area the tropics demand a different approach as many of the situations that will be encountered may be quite different to what they are used to.

Tropical Squalls and Fronts

Tropical squalls often catch newcomers to the tropics by surprise and can cause damage to gear. Squalls are always preceded by an impossible to miss black cloud that has a straight bottom roughly parallel to the horizon, hence their definition as line squalls. Tropical squalls always travel with the wind, so looking regularly to windward, one should not miss one approaching. They also show up well on radar and are quite visible to the naked eye even at night. If a squall is detected in good time, and if the advancing front is small, it may be possible to avoid being in its path by altering course. Sail should be shortened promptly as by the time the squall hits it is usually too late.

While squalls at sea can usually be easily dealt with by a vigilant crew, abrupt changes in weather caused by the passing of a depression can cause havoc among boats at anchor. With the strengthening wind often changing by as much as 180° in direction, boats anchored in places that were deemed to be safe and well protected can be put suddenly on a dangerous lee shore. Combined with a violent short swell produced by several miles of fetch across a wide lagoon, a boat can easily be driven ashore. Severe damage can also be caused by the chain being caught under coral heads.

Tropical Tactics

The tropics demand a different approach not just to offshore sailing but to navigation as well. Even with the help of GPS and other current aids to navigation, many tropical destinations are not accurately charted and should be approached with utmost caution. As many tropical islands in the South Pacific and Indian Oceans are protected to windward by massive reefs, few of which are lit, making landfall in such places can be a risky business and such difficulties are often compounded by the presence of strong, unpredictable currents. Thus it is always wise to set a landfall waypoint at a safe distance from the intended destination.

One's problems are far from over once landfall is made, as entering a lagoon is rarely a simple matter of just pointing the bows for the middle of a pass. One should attempt to synchronize one's arrival at the beginning of the incoming tide, just after slack water, when there may still be a slightly contrary outflowing current. This is the time when passes are normally at their calmest. What makes the situation difficult is not just the force of the tidal streams but also the fact that lagoons are constantly filled by the seas pouring over the windward reef, as a result of which the water level in some lagoons can be several feet higher than that of the surrounding ocean. It is not uncommon for an outflowing current to reach six knots or more and in some places even double digits. All these facts must be born in mind and it is therefore essential to carry a worldwide tide table, various software versions being available.

Eyeball Navigation

Once inside, most lagoons can be crossed relatively easily in good light. Some lagoons, mainly in French Polynesia and Fiji, may be beacons but generally one has to find one's own way. One must quickly learn the tricks of the trade, better known as eyeball navigation. Many tropical lagoons or anchorages are strewn with isolated coral heads, some of which reach up almost to the surface. In more frequented lagoons these are marked by perches, but often they are not. Depth sounders are of little help as the depths are usually quite constant and there is no early warning of the presence of such coral heads. However, in good light, they can be easily

seen in the clear water. Good light means having the sun behind the observer so the timing must coincide with favourable conditions. In other words one should plan on going west through a lagoon between early and mid morning, when the sun should be behind one's head, and, conversely, move in an easterly direction in mid afternoon. With the sun ahead of the observer the surface of the lagoon turns into an impenetrable opaque mass when not even obstructions that are close to the surface are visible to the naked eye. A pair of good Polarized glasses can help if the sun is not too low ahead of the observer. Being able to climb the mast, ideally provided with steps, can be a great advantage as the visibility from a higher point is much better than from deck level.

An absolute godsend for this kind of lagoon navigation is a forward looking sonar which shows the profile of the bottom and any dangers that may lay ahead. Depending on the model and strength of the signal, an FLS can see as far forward as 40 or 50 meters whereas the latest models are supposed to see between 100 and 200 metres.

Special Considerations

Those balmy sun-kissed tropical islands are not the healthiest places on earth as the early sailors soon found out. Now that so much more is known about UV light and other associated risks to our skins, the main concern is overexposure to the sun. A hat and if possible a long sleeved shirt should be worn, the boat should be provided with a bimini or awning and those who have a particularly delicate skin should use strong sun block cream.

The skin should also be protected from bites by mosquitoes or the irritating sandflies common to some of the beaches in the Marquesas. Repellent sprays are quite useful, but better still is to avoid being ashore at the critical times around dusk and early evening when mosquitoes are most active. Of the mosquito born diseases dengue fever is present throughout the Pacific, while malaria is the main hazard in islands west of Fiji (Vanuatu, Solomons and Papua New Guinea). In these areas prophylactics should be taken, but as several strains of malaria are now resistant to prophylactic medication the best protection is still to avoid being bitten. Not going ashore at dusk, using a strong

repellent while ashore in doubtful areas, using smoking coils and screening all openings, are simple precautions that seem to work.

Swimming has its own risks and although sharks are often present in lagoons, they are rarely of danger if some simple precautions are observed. As in the case of mosquitoes, the time to avoid is around dusk at shark feeding time. If fishing with a speargun, the speared fish should be taken out of the water immediately and put in a dinghy as the blood and vibrations emitted by a wounded fish will attract any sharks that happen to be in the vicinity.

Ciguatera Fish Poisoning

One serious hazard in all tropical waters is ciguatera fish poisoning. The culprit is a toxic microscopic algae that is ingested and concentrated in their flesh by reef feeding fish.

There are many different kinds of seafood poisoning, but the most prevalent type found throughout the tropics is what is now known as ciguatera. Ciguatera fish poisoning is endemic in all tropical areas and occurs regularly between latitudes 35°S and 35°N. It is estimated that every year there are about 60,000 cases worldwide, while in the Caribbean, where most cases occur north of Martinique, around 100 cases per 10,000 people are reported each year. The situation is possibly even worse in the tropical Pacific Ocean, particularly in French Polynesia and the Marshall Islands.

Over 400 different species of fish have been incriminated at one time or another, a species being toxic in one area but not in another, even within the same lagoon. This is the essence of the problem as there is no way of telling which fish may be poisonous and which safe. However, the actual source of the toxin is now known: a dinoflagellate, *Gambierdiscus toxicus*, a unicellular plant similar to a micro-algae. A creature of the ocean depths, normally only a few of these algae live on the reef but under certain circumstances their number can increase dramatically. Fish feeding on coral ingest these toxic algae and so the toxin enters the food chain. Not everyone eating ciguatoxic fish has the same symptoms although diarrhea, nausea, abdominal pain or vomiting usually occur within a few hours. Prickling in the fingers and toes as well as

tingling around the mouth are other symptoms accompanied by an alteration of sensation causing cold objects or drinks to feel hot or plain water to taste like soda and a shower to feel like pin pricks of electric shocks. Other symptoms are extreme tiredness and lethargy, itching, muscle and joint pain, a weakened pulse and falling blood pressure. In most instances the symptoms subside after a few days, although the itching and alteration of sensations can last for several weeks. The symptoms are caused by the toxin acting on the body's sodium channels thereby causing changes in the electrical potential and permeability of the cells.

Recently ciguatera has been treated successfully with IV mannitol. The usual dose is one gram mannitol per kilogram of body weight. The medication is infused intravenously as a twenty per cent mannitol solution. It is believed that mannitol acts at cell level by rendering the toxin inert. The earlier a victim is diagnosed and treated with IV mannitol, the more likely its success. Antihistamines, calcium gluconate, atropine and vitamin B have also been used to ameliorate the symptoms. Untreated, ciguatera can last between one to two months, although some symptoms may persist for longer.

The risks can be minimised by gutting fish as soon as it is caught and by not eating the head, liver, roe and viscera as the toxin is concentrated in these organs. All large fish caught inside a lagoon, or close to a reef, should be treated with suspicion, especially snappers, groupers, barracuda, jacks and moray eels. It pays to take local advice as most islanders know only too well which fish and which areas of their lagoon have to be avoided. Freezing, drying, cooking or marinating the fish does not destroy the poison and affected fish looks, smells and tastes normal. Various traditional tests have been recommended but none is truly effective. A researcher at Hawaii University has perfected a test kit capable of identifying the presence of ciguatoxin in fish flesh. When used properly, Cigua-Check (TM) will test ciguatoxin at levels generally below the level that can cause clinical symptoms in humans.

cigua@oceanit.com www.cigua.com

3. PASSAGE NOTES

This section will look at the different stages of the rally, giving an overview of the voyage and expected weather conditions for the ocean crossings. Passage notes are provided by author and yachtsman Jimmy Cornell, with weather advice from sailor and meteorologist Chris Tibbs. More information on the destinations is in the Local Information section, including lists of pilot books, and detail on departure and arrival will be provided at the Skippers' Briefings along the route.

Saint Lucia to Panama

This initial passage across the Caribbean Sea can be one of the more rigorous stages of the rally. The winter tradewinds blow more strongly, causing rough conditions with steep seas. Seas tend to build towards the Columbian coast. This is generally a downwind passage, and boats are often well-reefed.

Currents flow from the Lesser Antilles generally north-westward towards the Gulf of Mexico. Flow rates can be 1-2 knots, and are affected by wind strength. On the passage from San Blas to Colon the current runs generally eastwards, following the Panamanian and Columbian coasts, usually at less than one knot.

One area to be avoided is the relatively shallow sea off the Guajira Peninsula. It is prudent to set a course that stays in deeper water by passing north of a waypoint at 13°18'N, 71°40'W which is outside the 1000 metre line, where relatively less rough seas can be expected. From there a direct course may be set for the approaches to the San Blas Islands. Such a course will pass a minimum 30 miles off Columbia and any risks associated with passing too close to its coast.

Saint Lucia to Panama Weather

Expect moderate to strong E-NE tradewinds. Averages indicate 15-20 knots increasing from about 70°W. The direction becomes more NE'ly and the chance of gales also slightly increases to about 2% of the time.

Approaching Panama the wind is likely to become more variable with a chance of N or NW wind.

Panama is hot and humid and although it is technically the dry season, rain can be heavy with squalls.

Panama to Galapagos

Boats can experience both adverse current of over 1 knot and headwinds on this passage, but generally the weather is affected by the ITCZ. The south east tradewinds may not yet be established, meaning winds can be very light, and lots of motoring is not unknown. Expect hot conditions with rain.

Panama to Galapagos Weather

In the Gulf of Panama the most likely direction of the wind is N. There is also an anti clockwise current in the gulf.

With luck we will hold the northerly wind for the first 48 hours, although it will weaken with progress, before hitting the ITCZ.

Although there may be S or SW wind to begin with (occasionally even W), we should find that by half way the wind has backed to the S or SE as we move into the trade wind belt. Usually 10-15 knots, they will depend on the position and intensity of the high to the south. Gales are very rare and the sea surface temperature will be around 24-26°C.



The Galapagos Islands

Only four islands have settlements on them: San Cristobal, Santa Cruz, Floreana and Isabella. All cruising yachts are supposed to stop at one of the two main ports of entry: Baquerizo Moreno (Wreck Bay) on San Cristobal, and Puerto Ayora (Academy Bay) on Santa Cruz Island. In principle, boats that had cleared into Galapagos may also stop at Puerto Velasco Ibarra on Floreana but this must be arranged in Baquerizo Moreno.

The weather is very untypical for the latitude of the islands. Because of the cold water Peru Current (Humboldt Current) the normal water temperature can be anything between 15 and

18°C, hence the presence of the Galapagos penguins. The cold waters and warm air often cause the so-called garua, a misty condition more common in places like Ireland and not in islands that straddle the equator.

During an El Niño episode the waters get much warmer, which can have an effect both on local climate and on the local wildlife as birds that dive for their food are no longer able to dive to the greater depth where their normal source of food has migrated to avoid the warm surface waters.

Every island has something special to offer and one is constantly surprised not only at the abundance of wildlife, ashore, in the air and in the sea, but also its variety. Each island seems to have its own resident species, penguins on San Salvador, marine and land iguanas on Santa Fé, magnificent frigate birds on Seymour Norte, sea lions, flamingos and pelicans on Rabida, giant tortoises on Isabella and white-tipped sharks at Bartolomé. Sullivan Bay on Bartolomé is a picturesque lava crater with stunning views from the summit of the island.

Galapagos Weather

The Galapagos Islands are in the tradewind belt (just) and winds will be predominately between S and E with occasional NE. Average speed 8-13 knots with diurnal variations caused by the larger islands.

Galapagos to the Marquesas

If there is a favourable wind soon after the start, the recommended tactic is to sail a direct course to the Marquesas. If there is no wind, one should sail southwest to around 2°S where there is a better chance of finding the wind. From there the course can be set for one's destination.

An area to be avoided lies between 3°S and 8°S and 95°W and 108°W where frequent unsettled weather conditions have been reported.

One should avoid making too much southing at the beginning, as better conditions are normally found closer to the equator. There is also a higher chance of getting a favourable current by staying north of 5°S in the early stages.

These tactics are only recommended if there is enough wind for sailing, otherwise it makes more sense to motor along the rhumb line. Usually the weather gets better as the season progresses, with passages in March and April experiencing more unsettled weather than in May or June.

Galapagos to Marquesas Weather

As we progress to the SW the trade winds should become a little stronger and steadier although they are generally not considered to be as steady as their northern equivalents. The predominant direction is SE although they can wander to the E occasionally to the NE. The further south we get the stronger the wind will be with the average increasing to 13-18 knots.

French Polynesia



The Marquesas

Between the arrival at Atuona and the rendezvous in Tahiti World ARC yachts will have approximately one month to cruise the Marquesas and Tuamotus before making their way to Tahiti. The main difficulty will be how to divide the time between the Marquesas and Tuamotus. In my opinion the Marquesas are one of the most attractive cruising destinations in the world, so I would spend the bulk of the time there and make only two or three stops in the Tuamotus.

Hiva Oa

The landfall island of Hiva Oa is a perfect introduction to the diversity of the Marquesas. A steep road leads up from the village of Atuona to the small cemetery where Paul Gauguin was laid to rest in 1903. The French painter had spent his last days here and his paintings had first alerted the rest of the world to the beauty of these islands.

There are also good anchorages on the northern shore of Hiva Oa, and also a well sheltered bay at Hanamenu, at the island's western point, close to a cluster of ruined fortifications.

Tauhata

Atuona's roly harbour is not the best of places to spend too long but there is an alternative at the nearby island of Tauhata where Hana Moe Noe Bay provides a well sheltered anchorage.

The nearby golden beach is very tempting but having made that mistake ten years previously, when the infamous Marquesan sandflies had almost eaten me alive, we preferred to enjoy the scenery from the safety of our cockpit. So while the anchorage is perfect, one should only go ashore when the sun is overhead. There are two other good anchorages on the west side of Tauhata off the villages of Vaitahu and Hapatonu.

Fatu Hiva

Lying some 40 miles to windward of Hiva Oa is the smaller island of Fatu Hiva that boasts the most beautiful anchorage in the whole of French Polynesia. Called in French La Baie des Vierges (the Bay of Virgins) the surroundings of Hanavave are truly spectacular, with huge rock formations overlooking the tranquil bay. The small village at the head of the well-protected bay has a breakwater and short quay, which makes landing from the dinghy much easier than in the past. The detour from Hiva Oa is only recommended when the trade winds are not too strong.

There is also a good anchorage off the main settlement of Omoa, in the SW of the island.

Nuku Hiva

Although it is possible to sail around the island and anchor in one of the bays on its northern side (at Anaho or Hatiheu), the large well protected bay of Taiohae, off the island's main settlement, is a good base from which to explore the interior by rented car.

Many years ago an old Marquesan couple Daniel and Antoinette, retired to the innermost cove (Anse Hakatea) in Tai Oa Bay, on the southwest coast of Nuku Hiva. Visiting sailors were always welcome to their bay, which became known as Daniel's Bay. Those who are not put off by a tough hike may be tempted to take the trail that leads from the head of the bay to a one thousand foot high waterfall, reputed to be the third highest of its kind in the world.

Ua Huka

This small island lying east of Nuku Hiva is often

bypassed although it has a well sheltered steep sided anchorage at Vaipae aptly called the Invisible Cove as it is easily missed. At the head of the narrow inlet is the island's main village.

Ua Pou

The main settlement at Hakahau has little to recommend it but the mountainous interior of the island is truly spectacular. The typical rock spires, that are so distinctive when seen from afar, are even more spectacular seen in close-up. A useful anchorage, and a good starting point if heading for the Tuamotus, is on the SW side of the island in the Bay of Hakahetau, off the village of the same name. Landing from the dinghy on to the concrete quay can be difficult if there is a swell running.

The Tuamotus

The Tuamotus were until fairly recently rarely visited by cruising yachts, and for very good reason: navigation among the reefs and atolls even with the help of GPS is a daunting task and calls for a high degree of alertness and vigilance. It is a price some sailors regard as worth paying as these remote atolls fit the image of a tropical destination: turquoise blue lagoons, deserted islets shaded by swaying coconut palms and magnificent underwater scenery with a profusion of fish and corals. However, there are some basic rules to be followed, such as choosing an anchorage carefully and avoiding a long fetch if strong winds are expected or a front is predicted to pass. Most sailors used to cruising in the Eastern Caribbean do not expect the drastic wind changes that commonly occur in this area of the Pacific.



Makemo

Pass Arikitamiro gives access to the main village of Pouheva, located on the northern shore of a wide lagoon; the long fetch and the strong winds

making the anchorage both uncomfortable and risky. There is better shelter at the western end of the atoll where Tapuhiria Pass is located. There is some disagreement over the position of the pass, and care should be taken on approach. Access through the pass is quite easy and there is a good anchorage close to an abandoned copra shed.

Tahanea

The uninhabited Tahanea atoll is a nature reserve. There are several passes on its northern side, Pass Manino being considered the easiest to negotiate (provided one's timing is absolutely right). There is a good anchorage immediately to the right of the pass. The lagoon is reasonably easy to cross in good light and there is a good anchorage in the SE corner of the lagoon. The lagoon is a good diving spot with lots of fish, but a species of grouper is affected by ciguatera so one should be careful with the fish you decide to eat. As the lagoon is also known to have plenty of spiny lobsters, this is probably the safer alternative!

Fakarava

Fakarava has a very large lagoon much of which is taken up by pearl farms. Access is easiest through Pass Tetamanu, on the south side, and there is a good anchorage close to the NE of the pass. Tetamanu is one of the best passes in the Tuamotus for a drift dive and if it is timed at slack or to coincide with the very start of the incoming tide, one will have the thrill of virtually flying over the amazing coral formations, a sensation that is akin to watching an underwater film in fast motion. The large lagoon can become dangerous in unsettled weather, and Pass Ngarue, on its northern side, is incorrectly charted.

Rangiroa

The large atoll is the most popular tourist destination in the Tuamotus thanks mainly to the excellent diving in the crystal clear water. The main pass Avatoru is close to the village of the same name. Close by to the west is the large Kia Ora resort with a well-sheltered anchorage nearby. The anchorage can become dangerous in strong winds as the anchor chain will get wrapped around the coral heads. Pass Avatoru is swept by strong currents and in strong southerly or southeasterly winds the ebb (outflowing) current is continuous.

Tahiti

Papeete has one major advantage as due to an active local yachting community its repair facilities are the best between here and New Zealand and Australia. There are a couple of well-stocked chandleries and various specialist workshops. Provisioning is just as good, even if the prices are less so, as Tahiti is the most expensive place in the South Pacific.

At the point where Tahiti Nui (Greater Tahiti) meets Tahiti Iti (Lesser Tahiti – the peninsula sticking out to the south like a panhandle) the road passes Port Phaeton, a perfectly protected lagoon and Tahiti's best hurricane shelter.

A couple of kilometers towards Papeete, near a football field, is the Tahiti Yacht Club where visitors are always welcome to enjoy a drink on its shady terrace.

Moorea

After the hubbub of Papeete, neighbouring Moorea, only nine miles away, is a world apart. Its natural beauty has been preserved almost intact. The picturesque anchorages on its north coast are still among the most beautiful on the world cruising circuit. Cook's Bay, or more correctly Pao Pao Bay (as Captain Cook never anchored here but in nearby Papetoai Bay) is overlooked by the needle-sharp profile of Mount Mou'a Roa.

Huahine

The least populated of the Society Islands, Huahine is also the least spoilt. The island is in fact split in two, Huahine Nui (Great Huahine), to the north and Huahine Iti (Little Huahine) to the south, but the channel separating them is blocked by a bridge.

The best anchorages are on the west side where there are two passes Avapehi and Avamoa, leading to the main village of Fare. In settled weather it is also possible to use Farerea Pass on the east side that leads into the well protected Maroe Bay.

When approaching Huahine coming from the east, one should give the reefs extending south of Huahine a wide berth as several boats have come to grief here because of the southerly swell and strong onshore setting current.

Raiatea

The main pass, Te Ava Piti, is on the east side and

leads to the main settlement at Uturoa. Because of its ideal setting Raiatea is now one of the major charter destinations in the Pacific, its main attractions being the sheltered waters of its lagoon and central location at the heart of the Society Islands with Bora Bora only a short sail away.

The entire island can be circumnavigated inside the reef and there are several attractive anchorages, especially on the south coast which is rarely visited by other yachts.

Tahaa

Raiatea shares the same lagoon with her smaller sister island Tahaa. The stretch of water separating them is peppered with coral heads and reefs, but navigation is easy as all dangers are signposted with beacons and buoys. As there is deep water all around Tahaa it is possible to make a complete circuit of the island. To cater for the numerous charter and cruising boats even the smallest bay now sports its own restaurant and private dock, a large banner usually welcoming sailors for a drink and meal. There are some secluded anchorages close to the reef NW and NE of the main island.

French Polynesia Weather

The further south we progress, generally, the stronger the trade winds. There will be an increase in the percentage of the time that it blows from N of east. The vast majority of the time the trade winds will be between SE and NE 15-20 knots. Calms away from land are rare.

Occasionally a depression can develop in, or cross, the area. This can bring unsettled squally weather (see Pacific notes and diurnal pressure changes). Tropical storms are unlikely this far west. Gales are rare although gale force gusts associated with large convective clouds are possible.

Tahiti is 33 miles long and 15 miles wide therefore making a big difference to the wind flow around it. The bigger the islands the more of a local effect they will have on the wind. Sea breezes are likely and the pilot warns of occasional northerly or north west winds that can happen in the early part of the year. This can make passages through the reef difficult.

Society Islands Weather

Predominantly easterly wind 15-20 knots

although it will vary between SE and NE. The larger islands will have a large influence on the wind bending it around the high volcanic peaks.



Cloud and rain often forms over the islands.

Bora Bora, Suvarrow, Tonga

Bora Bora

The azure blue lagoon surrounding the main island that is dominated by the distinctive shape of Mount Otemanu can hardly be faulted. There is a lot of movement in the lagoon with fast launches, excursion boats and dive boats. The eastern part of the lagoon is much more tranquil and can be reached by a channel marked with cardinal and lateral markers that winds its way north of the island.

Bora Bora is just the place where even if one is not a softhearted romantic, at moments like this you do feel that there is nothing in the world to come close to the magic of the South Seas.

Suvarrow

“Five days after we had left Bora Bora a smudge on the horizon slowly coalesced into a spiky line of palm trees, then into a small island, then into a whole string of them: Suvarrow! We sailed through the pass into the sparkling lagoon, passed Anchorage Island and dropped the anchor among nine other boats sheltering in this idyllic spot.” Suvarrow, named after a Russian military hero by the first European explorers to set eye on it, is a typical Pacific atoll. Its seven or eight mile wide lagoon is surrounded by a reef studded with a dozen small islands. The special affection in which Suvarrow is held by sailors is shown by the various plaques that have been left here over the years.

Next to Tom Neale’s original wooden house the Cooks government recently built a solid hurricane

shelter known as the yacht club and adorned accordingly with flags from visiting yachts.

As in other large lagoons, the direction of the wind is critical in choosing a safe anchorage. The main anchorage only offers protection in north to SE winds, and is tenable in southerly winds of up to 20 knots. In stronger south or SW winds one has to cross the lagoon and anchor off one of the so-called Seven Islands. In west or NW winds it is best to move to the east side of Anchorage Island and anchor in the pass, in a small bay protected by the reef just to the west of the entrance channel. The actual pass is easily negotiated in good light except in strong NE or E winds.

Niue

“Three days after we had left Suvarrow we could already see our destination in the distance.” Niue

is a very strange island indeed, a massive slab of coral that had been pushed up by tectonic activity. Surrounded by sixty foot high cliffs, it has no natural harbors and the only shelter from the prevailing winds is an indentation on the west coast where a number of moorings have been laid for the use of visiting yachts. In settled conditions this is a safe spot to leave the boat while visiting the island, although the ocean swell is forever present and the constant surge makes landing a very exciting affair. The Niueans have provided a crane for hoisting the tender out of the water, but perfect coordination is needed to hook up the tender to the waiting strop while trying to get a foothold on the slippery steps.

Tonga Vava’u

Tonga’s northern group of islands has been a favourite cruising destination for a very long time. The strategic location of Vava’u at the crossroads of several sailing routes, as well as the reputation of the main anchorage, Refuge Harbour, as a safe hurricane hole, not surprisingly turned it into a busy yachting centre. Several charter companies are now based here.

There are about one hundred islands of all sizes, some sprinkled with sandy beaches, underwater caves and plenty of protected anchorages. The entire area provides an excellent opportunity for sailing in sheltered waters.

In spite of its popularity, Vava’u continues to be a most beautiful place, its tranquil waters being the favourite destination of some travellers of a very

different kind: scores of humpback whales that gather here to breed.

Bora Bora to Suvarrow to Tonga Weather

We must now start taking notice of the position of the SPCZ (South Pacific Convergence Zone). It may be marked on weather charts as a dotted line, or actually named. It is a trough of lower pressure and is line with an area of doldrums. It will go through irregular cycles of building and decline, which will upset the trade winds, but it is rarely dangerous.

The SPCZ becomes of greater concern is it interacts with another system, usually a front or trough from higher latitudes. It is claimed that by studying upper air charts (500mb) an upper air trough may be identified and cruising sailors will be able to pick up a potential storm before the forecasters do. Easier to do in retrospect than to predict! The further North we are, the less likely there will be a problem, but any low shown on a synoptic or forecast chart should be taken seriously.

Heading for Suvarrow, the trade winds should be E-SE, occasionally NE around 13-18 knots, probably easing a little as we move north.

There is an increasing chance of squalls as we proceed west.

Turning south to Tonga, the wind should increase slightly and stay in the SE-E with a lower chance of NE winds.

Tonga to Fiji

With approximately twenty-four days available between the arrival in Vava’u and the rendezvous at Musket Cove, one should plan on spending between five and seven days in Vava’u before resuming the voyage. Fiji is protected from the east by a string of extensive reefs, once an impenetrable natural barrier, that separates Melanesia to the west from Polynesia to the east. Passing that difficult obstacle was until fairly recently a major challenge and many vessels, both small and large, regularly ran aground and were lost in that maze. While the challenge is still present, the hazards are much more manageable although even with the help of GPS and radar, a high state of alert is highly advisable.

Beyond the reefs is the Koro Sea, a large body of water that extends between Fiji's main island of Viti Levu to the west and the Lau Group and its reef systems to the east. There are several islands facing Viti Levu's east coast and stopping at some of them is possible as there are several well-sheltered anchorages.

The main pass leading to the Koro Sea is Oneata, and as this is the main shipping channel it is wide and relatively well lit. Two other passes, Lakemba and Nanuku, are further north. Which pass to use will depend on the intended port of entry. Coming from the east, the most convenient ports of entry are at Savusavu, on Vanua Levu Island, and Levuka on Ovalau Island. Savusavu is only useful if planning to spend some time in Eastern Fiji or if planning to take the shortest route to Western Fiji and Musket Cove. Levuka is more convenient if planning to stop at the capital Suva, although in that case it is just as easy to go straight to Suva and clear in there.

Access to most islands in the Lau Group is controlled by a cruising permit. Continuing west from Savusavu one sails north of Viti Levu, a route which is indeed much shorter than the southern alternative.

In recent years, the Fijian authorities have returned ownership of inshore waters to the village communities and the well established custom of paying one's respects to the village chief must be strictly observed. The traditional gift (sevusevu) of chewing tobacco may now be substituted with a gift of money. Normally this need not amount to very much but in places frequented by cruising yachts, especially in the western island groups of Yasawa and Mamanuca, the sums demanded can be quite high.

Sailing south of Viti Levu allows for a short stop at Suva, a vibrant colourful city with an attractive cultural blend of Fiji's two main ethnic communities, Fijian and Hindi. On the way to Musket Cove there are good cruising opportunities in the Kandavu Group and also at Beqa Island (pronounced Mbenga). A personal recommendation is to stop at Daku village on the north coast of Kandavu where the local community has decided to take matters in hand to protect the environment, grow organic food and welcome visitors in the traditional way. Daku Bay is well protected but should be entered with care as there are a few isolated coral heads.

Closest to Musket Cove are the Yasawa and Mamanuca Islands - ask first at Musket Cove where they can obtain the latest information as to which islands are advisable to visit.

Tanna

To make visiting sailors more comfortable and encourage them to stay longer at Port Resolution, Chief Ronnie of the neighbouring village had built a large hut on a headland overlooking the anchorage to be used as a shore base by sailors and had put his nephew Wherry in charge. The airy clubhouse is now adorned with flags, club burgees and other mementoes left behind by visitors.



Tonga, Fiji and Vanuatu Weather

Fiji is on the edge of where the SPCZ is likely to be found. The trade winds here are influenced by high pressure over Australia. If the South Pacific high is ridging to Australia, then the trade winds will stay to the east. However, if high pressure has built over Australia (a usual pattern in the Australian winter) then the trades will be more to the south east or even the south southeast. This is one of the reasons for the development of the SPCZ as southeast wind converges with more easterly winds.



Vanuatu to Mackay Weather

The prevailing wind is the SE trade wind with the pilot charts showing the for over 50% of the time at 13-18 knots. If we take into account the time the wind is between south and east, it is the overriding direction.

As we approach the coast the wind direction is likely to veer more southerly. The weather will be influenced by Australia and the position of the high pressure over the continent. The chances of gales increases, but is still low. The current that has been with us across the Pacific splits, with one part heading NW and the other turning S to become the east Australia current.

Mackay to Thursday Island

The cruising leg from Mackay to Thursday Island is a unique opportunity to experience one of the natural wonders of the world - the Great Barrier Reef.

Mackay is the gateway to the Whitsunday Islands, an archipelago of 74 islands varying from luxury resorts with all amenities to nature reserves.

The winds are normally strong southeasterlies, occasionally blowing at 25 to 30 knots, which makes for some exhilarating sailing in the generally sheltered waters. Navigation is easy but outside the marked channel the usual caution exercised when sailing in coral waters should be applied. Night anchorages should be picked carefully and are normally safer in the lee of islands or headlands. Anchoring in the lee of a reef is generally safe in daytime but can become uncomfortable at high tide.

The clear waters abound in colourful tropical fish, giant clams and stupendous coral formations, and provide divers and snorkellers an unequalled view of an ever changing underwater scenery.

A convenient stop can be made at **Port Douglas**, which is a busy base for excursion and dive boats. Marina Mirage has all facilities but it is also possible to continue upriver and anchor in a secure and scenic spot. This is crocodile country so swimming should not even be considered, and in fact there is a good chance of seeing crocodiles sunning themselves on the shore. Swimming or even paddling in shallow water from here and all the way to Darwin should be **avoided** because of the real danger of salt water crocodiles (salties). Diving and snorkeling,

especially on the offshore reefs, is considered safe if normal precautions are observed.

Most of this part of the Great Barrier Reef will be sailed in the wake of Captain Cook, who passed through here in 1770, charted and named land features in this entire area, and nearly lost his ship Endeavour when it ran onto a reef at night. Fortunately the large piece of coral got lodged in the hull allowing the crew to nurse the ship into a nearby river where repairs could be carried out. This is now the site of **Cooktown**, set on the banks of the Endeavour River. Claimed to be the site of the first European settlement in Australia, the small town, which is also the northernmost town in Queensland, is well worth an overnight stop.

One of the highlights of this cruise is a stop at **Lizard Island**, which lies approximately fifty miles north of Cooktown. Discovered by Captain Cook and named by his botanist, Joseph Banks, after the large number of lizards encountered, the island is now a nature reserve and strict rules apply. The recommended anchorage is in Watson's Bay, close to an exclusive resort. Giant clams and manta rays are to be seen everywhere, while a visit to Cod Hole will bring the snorkeller face to face with the massive Potato Cod.

Continuing in a general NW direction there will be several good anchoring opportunities either at the offshore **Hilder** or **Crescent** reefs, at **Howick Island** or tucked in behind **Point Barrow** in Ninian Bay.

Past Cape Melville a stop at **Flinders Island** should not be missed. There is a well sheltered anchorage in Owen Channel, between Flinders and Stanley Islands. From here to Cape Direction it is best to stay in the main shipping channel as there are many isolated reefs on both sides of it. From Cape Grenville the channel runs almost straight north to Cape York, and the northern tip of Australia, then turns WNW towards the Torres Strait and the Indian Ocean.

Thursday Island

Many places, especially in Australia, deserve the description of 'frontier town', but none comes closer to it than the settlement on Thursday Island. Today's population is just over three thousand people, some of whom are the original Torres Strait islanders, a Melanesian people related to tribes in neighbouring Papua New Guinea. The island experienced a brief period of prosperity

towards the end of the 19th century when it attracted a multinational force of pearl divers.

Strict quarantine regulations apply inside Australia and at Thursday Island yachts cross the state border from Queensland into the Northern Territory. All fresh food and prohibited produce may be confiscated on arrival in Thursday Island so do not necessarily provision in Mackay to last all the way to Darwin.

Mackay to Thursday Island Weather

Tradewinds of 10-15 knots can be expected. It is said that some charter boats only use one jib sheet, the wind is so steady! Reports for Mackay are a little more variable, however statistics for Thursday Island show E and SE as the only wind directions.

The further north, the more favourable the current.

Thursday Island to Darwin

There is always a steady easterly wind blowing through the Torres Strait and, backed by a strong west-setting current, boats are spewed into the Indian Ocean like corks from a champagne bottle. The change from the dark blue waters of the Pacific to the dull green waters of the Arafura Sea is abrupt and unexpected. Even the wind feels different and after the boisterous trade winds experienced along the Great Barrier Reef the light winds almost feel like having a different texture. One has the distinctive feeling of entering not just a different ocean but a different world.

The leg from Thursday Island to Darwin is straightforward and there are two ways to reach Darwin, the easier but longer route that passes west of Bathurst Island, or a shorter route through the Dundas and Clarence Straits that saves over 150 miles. The latter route is sometimes avoided by cruising yachts as the straits are swept by strong tides and the intricate route through



a maze of reefs and small islands makes for challenging navigation, although the route itself is marked by buoys and lights. In order to be able to sail this route one must catch the right tide and that means arriving at the northern entrance into Dundas Strait at exactly the right time.

Dundas and Clarence Straits Short-Cut

Using this route needs careful planning so as to ideally cover the critical distance of 64 miles in one tide, which can be done provided the wind is favourable. Cap Don, which is four hours before Darwin high water, should be reached at that time. The SSE setting stream starts flowing at three hours before Darwin high water and continues until one hour after Darwin high water, with a maximum rate of 3.5 knots at springs.

There are various shoals to be avoided on this stretch so a course should be set to pass east of Abbott Shoals, then sail to the next waypoint east of Rooper Rock close to the entrance into Howerd Channel. This is the recommended shipping channel and is therefore better lit an easier to navigate. The favourable stream starts here at four hours after Darwin high water and turns at two hours before Darwin, so one has eight hours of favourable current.

Darwin

The capital of Australia's Northern Territory is a modern city that has had to be re-built twice from scratch, once after it was badly destroyed in the second world war, and then in 1974 when cyclone Tracy tried to complete the unfinished job of the Japanese bombers. Although the Territorians, as the locals are referred to, are keen to project Darwin's reputation as a frontier town, it is in fact a pleasant friendly place, with pastel coloured buildings, wide tree-lined avenues and a slow measured pace perfectly adapted to the usual 40°C temperatures.

Thursday Island to Darwin Weather

Through the Torres Strait the current, and sometimes with wind, accelerates and 20-30 knots is not unusual. As we head west the chances of gales increases. Forecasts are however good around Australia, and note should be made of what systems are active over the land.

As with elsewhere in the tropics, squalls are likely.

The South Indian Ocean

Bali

Bali Marina is always full with cruising boats at the height of the season between July and November. In spite of the massive impact of tourism, traditions are still very much alive, and the Hindu religion, to which most Balinese belong, plays an active part in their day-to-day lives.

In the interior life continues at a pace that had hardly changed for centuries, with people tending their fields and buffalo drawn ploughs scouring the deep mud of terraced rice paddies. No visit to the interior is complete without calling at some of the temples, foremost among them those closest to the sacred Gunung Batur Mountain.



Darwin to Bali Weather

We are in Darwin at the end of the Australian winter; indigenous Australians know this time as Malaparr, the cooler middle part of the dry period, with the humidity rising from the end of August.

The predominant wind is E or SE 10-15 knots, although Darwin itself is more variable with some sea breezes from the NW. Once clear of the land, expect E-SE increasing a little as we move to the west. Currents are generally favourable with a SW component. Close to the land the wind will become more variable and showers/squalls can be expected even though we are in the dry season. At 8°S Bali has a dry season extending from July to September.

Cocos Keeling

Direction Island on Cocos is unique in that it feels as if it belongs to cruising sailors. Because of its remoteness this Australian outpost in the South Indian Ocean has gained the affection of all long distance cruisers who call there. The authorities have made a visible effort to welcome

sailors, having cleaned up the island, installed a barbecue pit, toilets and built an open sided hut with tables and benches. There is even a phone for free local calls, and two large water tanks to use for a shower or to do one's laundry. The trees near the so-called clubhouse are adorned with hundreds of mementoes of boats that had passed through, among them some famous names.

"There were nine other yachts there when we arrived. An Australian police officer came over in a boat from the main settlement on West Island and quickly dealt with all formalities."

There are two inhabited islands in the large lagoon, Home and West Island. Home Island is closest to Direction Island and is easily reached from there by a large dinghy. There is a regular ferry that crosses the lagoon from Home to West Island. This is the main settlement on Cocos, with police, clinic, post office, library with internet access.

Mauritius

After the tranquility and slow pace of Cocos, the noise and constant traffic of Port Louis, the busy capital of Mauritius, can be almost overpowering.

Cruising opportunities around the island are few, but those who wish to get away from Port Louis will find a good anchorage at Grande Baie in front of the yacht club building. There is an eight foot depth restriction in the channel leading into the bay.

Bali to Cocos to Mauritius Weather

September and October is the change of season from Southern Hemisphere winter to summer.

The ITCZ will move south to be south of the equator during this time. The trade winds should increase to 15-20 knots predominately from the E or SE and the Cocos Islands are within the trade wind band.

The trades extend northwards to the ITCZ or equatorial trough. The ITCZ can move close to the Chagos Islands, bringing squalls and winds from other directions than those expected from the trade winds.

Heading towards Mauritius, the trade winds should strengthen again to 15-20 knots, possibly to 25 knots from the S or SE. How much they strengthen and the direction will depend on the position of the sub tropical high pressure. The average position at this time is about 30S 75E at 1024mb, however it will migrate and may split in two. The further east the high, the more E or even

NE the winds will become. If the high splits or moves west, the winds will be more from the SE.

Reunion

In spite of their shared history, as both islands were originally colonised by French settlers who started the sugarcane industry, neighbouring Reunion could not be more different from Mauritius. Reunion is a department of metropolitan France, ensuring that this island in the midst of the South Indian Ocean remains a part of France.

The mountainous interior of Reunion is dominated by the remains of three huge craters called "cirques" whose sheer walls rise to well over 2,000 metres. The volcanic scenery is quite breathtaking and the best way to appreciate it is to go on one of many walks, the island being crisscrossed by several marked paths.

Madagascar

Including the large island in a South Indian Ocean cruise of limited duration is no easy matter primarily because the only suitable place to spend any length of time in a protected area is Nosy Bé, off the NW tip of the island. I eventually decided that a visit by air would be more practical. There are frequent flights from both Mauritius and Reunion to the Madagascan capital Antananarivo. Once there it is easy to plan a trip that takes in most of the island's main attractions, including its wildlife.

Richards Bay South Africa

The well protected area of the large harbour where the Zululand Yacht Club and Tuzi Gazi Marina are located is an excellent place to relax after the long voyage across the South Indian Ocean. While this industrial town has few attractions in itself, the proximity of Hluhluwe-Umfolozi Nature Reserve, one of the largest game parks in South Africa, is a great temptation. Also within easy reach are the extensive St Lucia wetlands as well as the Phinda game reserve.

Mauritius and Reunion to Richards Bay Weather

Although the sub tropical high pressure will often ridge to South Africa, at other times it will be displaced by systems to the south. As we move out of the tropics, the trade winds become more variable and the chance of a depression

from further south increases. Once we pass the southern tip of Madagascar the winds are likely to become more variable, although predominately S through to SE and NE.

Approaching the west side of the Indian Ocean basin, the south flowing western boundary current will be met. On the route this starts as the equatorial current that turns south to form the East Madagascar Current. This joins the Mozambique Current and is then known as the Aghulas Current near South Africa. Initially this helps, but there is a need to cross the current to get to South Africa. At times the Aghulas Current runs at 5 knots making this a dangerous stretch of water when the wind is against the current. Large ships have been lost in these conditions as the tail of a southern ocean storm can reach these latitudes. This is going to be of significance between Reunion and Richards Bay and then around the coast to Cape Town, potentially the toughest leg of the whole voyage.

Approaching Africa, stronger, more variable winds increase in frequency. As we move into the summer months, depressions (heat lows) will form over the land which will sometimes move over the sea. Weather systems will develop and change quickly with the additional heat brought south by the current, the cold southern ocean a few hundred miles to the south, and a large continent heating up to the west.

It is important to watch for transient lows that may deepen rapidly in the Aghulas current. It is of great importance not to cross the current with a strong S-SW wind as the seas quickly become dangerous. The most likely time for a SW wind is with the passage of a cold front from a Southern Ocean storm.



Richards Bay to Cape Town

The looming challenge of the long haul around the southern tip of Africa to Cape Town is a daunting prospect and while some sailors deal with it by trying to get it over as soon as possible, others prefer to take their time and enjoy first what South Africa has to offer. With good planning and a bit of luck the approximately 900 miles from Richards Bay to Cape Town can be quite easily negotiated, and scores of small boats do it every year without any problem. The main culprit is the fast-flowing Agulhas Current that sweeps parallel to the coast at rates between three and five knots. The strongest rates are along the 200 metre contour, which can be as far as sixty miles offshore or even further but the effects of the current can be felt even relatively close to the coast.

Sailing around the bottom of Africa is very much like a game of snakes and ladders as you depend entirely on the weather dice. If you are unlucky and conditions are not right you simply won't get anywhere. The one redeeming factor is that while the weather can indeed be worse than almost anywhere else, it is generally fairly predictable. On a synoptic chart, the lows and accompanying fronts marching up from the southwest look like beads on a string. As the system gets closer, the wind swings into the SW and the barometer starts to rise. Once the front has passed, the wind backs into the SE and continues to back slowly to NE. When the barometer starts falling again, you know that the next front is on its way, so it's high time to look for shelter. The gap between lows can be anything from 36 hours to five days.

The section between Durban and East London is the most difficult stretch along the entire South African coast: 250 miles with absolutely no shelter along the aptly called Wild Coast. This is most certainly no place to be caught out by those infamous SW winds generated by a low coming up from the Southern Ocean. Combined with the strong current flowing against the wind, this causes very rough seas that can overcome yachts and occasionally huge tankers as well.

On my own voyage through the area we had relatively good conditions for about half the distance but then the wind started to shift into the SW foretelling a blow from that direction. The first thing to do in such a situation is to move as quickly

as possible inshore, into shallow water, so as to be out of the current before the wind gets too strong. Even winds of 25 knots against that mighty current can create hellish conditions with huge breaking waves. As there was no suitable harbour within reach, I decided to continue by staying as close to the coast as possible. We made it into shallow water before the wind got too strong and spent the rest of the night taking short tacks and making painfully slow progress. Although we had some swell, it was manageable and we managed to continue moving in the right direction.

By the following day the wind had gone into the SE and we could see in the far distance the low profile of Cape Agulhas, the southernmost point of Africa. It took us all day to reach the more famous Cape of Good Hope. Initially called Cape of Storms, it was on Prince Henry the Navigator's insistence that it was changed to the current more positive sounding name. From there it was an easy run to Cape Town.

My own experience fully confirms the earlier statement, that in these waters when conditions look right – you go. When I saw that the weather looked promising although we had just arrived in Richards Bay from Reunion, we wasted no time, put to sea immediately and made it as far as East London in under three days. Another spell of good weather allowed us to complete the next leg to Cape Town in less than four days. On the way we passed a few tempting places, some of which I had not visited before, but the favourable conditions made it easy to resist their temptation and so we just carried on.

Durban

The short leg from Richards Bay to Durban is normally the easiest. Few boats choose to bypass Durban, reputedly the busiest port in Africa and a favourite seaside resort among South Africans. Visiting yachts are normally directed to Durban Marina which is associated with the Royal Natal Yacht Club and the Point Yacht Club. Repair facilities are the best outside of Cape Town and the large town has a lively cultural life.

Durban is a good place to wait for the right conditions to tackle the 250 miles to East London, the next place offering shelter. Although temptingly located along this route, Port Alfred is not recommended as the entrance is encumbered by a bar over which the swell breaks heavily.

East London

The narrow river entrance into East London is easily negotiated as the outflowing current of the Buffalo River is not strong. Visiting boats normally dock near Latimer's Landing located on the north bank (right hand side going up) just below the first road bridge. The East London Yacht Club clubhouse is on the same bank right by the harbour entrance.

Port Elizabeth

Set in the western part of Algoa Bay, this is the largest city in East Cape Province and is located approximately halfway between Durban and Cape Town. Port Control should be contacted before entering and will direct arriving yachts to the small marina run by the Algoa Bay Yacht Club located in the SW corner of the harbour.

Port Elizabeth is a good base from which to explore several nature and game reserves.

Port St Francis

Located some forty miles west of Port Elizabeth across St Francis Bay the small marina may be useful if shelter needs to be found at short notice. However, entry should not be attempted if there is a high swell running and the narrow entrance between the two breakwaters may also be difficult to handle except in settled conditions.

Knysna

Set on the shores of Knysna Lagoon, access to the sheltered waters between the high cliffs of the Heads can be a daunting experience. The best time to enter is one hour before high water, in daytime and only if there is no strong onshore wind. Leaving Knysna Heads can be even more difficult than entering and must be well timed to coincide with slack water.

Mossel Bay

The last recommended stop before Cape Agulhas lies forty miles west of Knysna. The small Mossel Bay Marina occasionally experiences surge and the use of a stern anchor is recommended. Mossel Bay is the last convenient stop before Cape Agulhas which is some 100 miles distant. The effects of the Agulhas Current are less noticeable from here on and while the weather should still be watched carefully, the worst has now been left behind.

Cape Town

Well worth taking advantage of is a concession made by South African Customs to visiting sailors is that any tax paid on equipment, material or charts (but not labour or consumables) bought in the RSA will be refunded in full. Originals of all invoices and bills should be kept and submitted to Customs in Cape Town before departure who will arrange for a refund to be paid into the bearer's account.

Cape Town is a perfect base from which to explore as much of South Africa as time will permit.

Richards Bay to Cape Town Weather

The weather the very dependent on the positions of the high pressure in the south Indian Ocean and the high in the South Atlantic,. At times these will ridge together, at other times there will be a trough between the two with the chance of a depression moving north to affect the area.

The Aghulas current follows the coast (with a small inshore area of light currents; sometimes a counter current) and must be taken into account. Mean speeds of 3 knots with peak speeds of 5 knots are to be expected and this current is considered to be one of the strongest in the world. Local weather forecasts should be sought as this has proven to be a dangerous coast. Not just for yachts, bit also large shipping caught in the Aghulas curreant with a strong SW wind.

Approaching Cape Town the wind is often from the SE and may blow strongly for a number of days. In the Bay of Cape Town it will often be calm overnight with the SE starting suddenly during the morning, blowing around the east side of Table Mountain.

Cape Town to Salvador

The French have a term for finishing a good meal with a tasty morsel that is kept "pour la bonne bouche", as a last bite. The final stages of World ARC should feel the same as weather conditions in the South Atlantic Ocean are usually the best to be experienced on a world voyage with steady SE trade winds, uncomplicated navigation and long stretches of pleasant ocean sailing. The threatening weather systems that roll up from the Southern Ocean to blast the South African coast will be quickly left behind, squalls are far less common than in other oceans and tropical storms are virtually unknown.

Favourable trade winds should be picked up soon after leaving Cape Town and normally they should last all the way to the Caribbean. Along the coast of Northern Brazil a favourable current will speed boats on their way and even the crossing of the equator should have little of the typical doldrums weather as the Intra Tropical Convergence Zone is at its narrowest at its western extremity.

St Helena

It is always a really good feeling to arrive in a place where visiting sailors are not only warmly welcome but their presence makes a visible contribution to the local economy. Her very isolation is probably St Helena's main attraction and the lack of an airport currently means that only determined travellers actually set foot on this remote island lost in the vastness of the South Atlantic.



Salvador da Bahia

In the not so distant past very few cruising yachts stopped in this vibrant city set on the shores of the Bay of All Saints (Bahia de Todos os Santos) and often referred to simply as Bahia. The stop in Salvador is a perfect introduction to Brazil as few other places provide a better insight into the melting pot of races, cultures and traditions of this truly amazing country. For over two hundred years, Salvador was the capital of Brazil, and many of the old buildings and churches have been restored to their former glory.

Cape Town to Salvador Weather

Back into the Atlantic, and the weather is controlled by the St Helena High, sometimes called the South Atlantic High.

The Bay at Cape Town can have remarkable winds with the wind shadow of Table Mountain disturbing the flow. Strong SE winds can come around the east side of the mountain with SW winds on the west side giving an area where you literally sail from 30 knots to zero in a few

hundred metres.

The start from Cape Town is usually best effected by a course of north west into the start of the trade winds. These can be strong (up to 30 knots) for the first 48 hours or so before dropping. Sometimes the SE wind in Table Bay will be strong enough to hug the coast for the first day, but getting some westing is usually advantageous.

The SE trades of the South Atlantic are said to be the steadiest trade winds in the world, averaging 13-18 knots. To avoid the high pressure, the route to Brazil follows a northerly route before heading west, the stop in St Helena reinforces this option.

Between Cape Town and St Helena, the wind should be predominately SE. From St Helena to Salvador it is likely to back more easterly, possibly even NE by the time of arrival.

Squalls will increase the further west we get, with the worst squalls usually in the latter part of the night and morning. Approaching the Brazilian coast the south flowing current (the Brazilian Current) will be felt. This is often marked by towering cumulus and will be the first sign of land. The trade winds ease on the west side and swing to the E or even NE, strengthening near the land during the day, although night approaches can be in light conditions.

Brazilian Mini-Cruise

Compared to other parts of Brazil, the 350 mile stretch between Salvador and Recife has little to offer from the cruising point of view except to those looking for a challenge and keen to explore unknown waters. A number of rivers empty into the ocean along the largely featureless coast but access is often encumbered by bars. Shallow water extends to several miles offshore and approximately halfway to Fortaleza there is a large area peppered with oil platforms. From Punta de Prago onwards the coast is fronted by a string of reefs making inshore navigation even less attractive. Bearing all this in mind, the best solution is to spend most of the available time cruising around Salvador and then sail nonstop. Favourable winds and current normally ensure a fast passage along a route that should stay well offshore.

A possible stop can be made at Maceio, which

WORLD CRUISING CLUB RALLY HANDBOOK

04. Weather and Communications



is a rather unremarkable sugar exporting port set on the shores of a large lagoon. There is an anchorage past the commercial port, east of Playa de Jaragua, in front of the local yacht club.

Cruising opportunities in the immediate vicinity of Salvador are surprisingly varied and the large Bahia de Todos os Santos has many tranquil anchorages, all within a short sail from the hyperactive city. The bay is almost landlocked by the large island of Itaparica that faces the city and is a favourite weekend retreat for Salvadoreans. The well sheltered Aratu Bay in the NE part of the larger bay is accessible through a well marked channel and has many attractive anchorages. There are more places to explore around the island of Frade. Also worth investigating is Rio Paraguaçu in the NW part of the large bay. The river is navigable for several miles and has depths of approximately thirty feet all the way to the small town of Sao Francisco.

If time permits, another attractive cruising area is approximately fifty miles south of Salvador centred on the Bay of Camamu, a well protected estuary at the confluence of two rivers. The trip south can be broken at Morro Sao Paulo where there is an anchorage on the west side of the peninsula close to the ferry dock at a village called Gamboa. Detailed charts for this area as well as Bahia de Todos os Santos are available from the chandlery at Bahia Marina in Salvador.

Fortaleza

Fortaleza, in Brazil's north eastern state of Ceará, was home to many industries in the early 20th century. It is still a significant port but since the mid 1960's it's has become a popular destination for many Brazilian and international tourists who visit to enjoy the vibrant beach culture and 'day trip' further along this interesting coastline.

Salvador to Caribbean Weather

Along the coast from Salvador north to Recife, the trade winds will be E-NE and offshore the current will be against us. Inshore the winds are more variable. Often dropping light at night, whilst offshore there will be steadier wind and stronger adverse current.

The equatorial current splits at the north east corner of Brazil, with part heading south and the other heading WNW along the coast of Brazil all the way to the Caribbean.

The trade winds will swing to the NE along the route once through the ITCZ. The ITCZ is considered to be at its narrowest on the western side of the Atlantic, however being too close to the land, the ITCZ appears to widen again. The river Amazon discharges not only a huge amount of water into the Atlantic, but also trees, branches and vegetation.

Average wind speed for the trade winds for this section is E-NE 15-20 knots.

The ITCZ is north of the equator and large scale convection can cause some problems with squalls along the route, however at other times reports are of steady trade winds with little squall activity.



4. RALLY COMMUNICATIONS

World ARC Radio Net

Twice each day while the fleet is at sea, there is an SSB HF radio net, enabling yachts at sea to stay in contact with each other during the crossing, pass on news, position reports and co-ordinate emergency assistance. It also provides a forum for intra-yacht social contact, with various fun activities developing on the net each year. There have been “joke-of-the-day” contests, virtual dinner-parties, recipe swaps on-air and a whole compendium of sailing tips exchanged via the net. Such is the importance of the radio net, that one previous participant described it as “the glue that holds the rally together.”



The radio net is co-ordinated within the fleet by volunteer radio net controllers. It is their job to act as host, switch frequencies as the fleet spreads out, run the roll-call, invite relays, rebroadcast the daily weather forecast and record any yacht positions for onward transmission to Rally Control. It can be tiring, but all the net controllers agree that it is also tremendous fun.

Each year, the great advantage of the radio net is shown when co-ordinating the fleet response to emergencies at sea. HF radio provides the only means of broadcast communication at sea, making it ideal for speaking to a large group simultaneously. And of course, speaking on air is free, with no per minute charges unlike satellite systems.

Volunteer Radio Net Controllers

A number of volunteer radio net controllers are required for the rally. The job is a lot of fun and very rewarding. Radio net controllers are normally so popular with the fleet by the time they arrive in port they rarely have to buy a drink at the bar!

Although not essential, it is expected that volunteer radio net controllers will have some experience operating SSB transceivers and in addition a reasonable level of English is required. Please let World Cruising Club know if you are interested in being involved.

Position Reporting

At the start of the rally, each yacht will be provided with a satellite tracking device. These compact self-contained units are easy to fit and do not require any external power source. Once activated, the units send an automated position report at regular intervals. Yacht positions are then displayed on the rally website (see [Preparation section page 8](#)).

The tracker and associated data costs are included as a rally benefit within the entry fee.

A daily list of all fleet positions will be sent to the fleet via email. Yachts not wishing to receive either the fleet positions or the rally weather forecast should mark these preferences on their yacht data sheet at rally check in.

Contacting Rally Control

Communication with Rally Control is via email. It is a requirement that participating yachts are capable of sending and receiving email at sea. Any users that have a ‘whitelist’ or restricted access on their email accounts (e.g. Winlink) should ensure that email address rallycontrol@worldcruising.com is added to the approved senders list. During the rally, all communication to and from Rally Control will be via this address.

Automatic Email Service

The automatic email service allows you to request up-to-date information about the rally (positions, weather, communications lists etc) whenever you want to. Simply email your request to the service in order to receive an automated reply with the data. Full instructions on how to use the service are provided at rally check-in. The automatic email service will only be available to users who register their boat at-sea email address via the Boat Information page in the website Member’s Area. The service will be activated one week before the start of the rally. Users can opt in or out of receiving daily Weather and Fleet positions, as required, and should ensure that warc2015@worldcruisingevents.com is added to their approved senders list.



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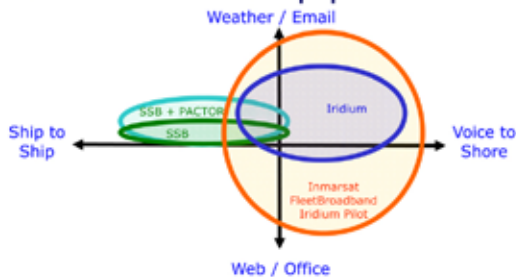
5. CHOOSING LONG RANGE COMMUNICATIONS

In addition to having an SSB radio, it is a requirement that the boat be equipped with long range communication equipment capable of sending and receiving email messages whilst at sea.

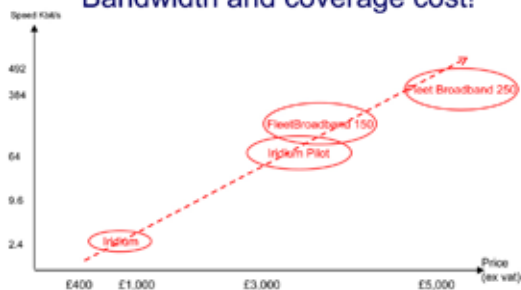
While the range of equipment suitable for the typical cruising boat is limited, the capabilities of the different equipment can make the choice of which to install difficult.

Define your at sea-communication needs:

Understand The Equipment Limits



Bandwidth and coverage cost!



Satellite/SSB Speeds ...slow, but not a problem!

"Broadband" 512Kb/s+	Inmarsat FB 150/250	"Dialup" 48Kb/s	Iridium 2.4Kb/s	SSB <2.4Kb/s
Broadband!	Email, Web, Even video!	Slow web browsing	Text emails, Small files / pictures	Text emails
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SSB is a radio transmission - one to many - and is a good way of communication with a group of people. Its convivial but public!

Satphone is a telephone call - one to one - and is a good way of privately obtaining specific information, such as advice from a weather router, or contacting home.

Who needs to be able to contact you?

The typical cruiser just needs to send and receive emails for weather and social communication from friends and family so will be happy with a basic Iridium connection or an SSB radio + pactor modem. However, if you are trying to run a business then you will need a bigger and more expensive option for higher data and instant connection.

Do you want instant communication?

Is instant voice required, or is email sufficient? If you need to call or receive calls at sea, then you will need a satphone.

How many nights will you be away from land after the offshore passage?

Once you get ashore internet cafés are widespread and local mobile telephones can be used for voice and email so you may only need your "at sea" capability for short periods.

What is your budget?

Look at the total cost –initial purchase and on-going airtime charges. Think about installation help and support as part of your purchase, since at sea email systems are much more complex to set up than the "plug & play" internet connection you have as a home user.

Be realistic in you expectations

At sea email is significantly slower and more expensive than the internet you are used to at home. Think about the total cost –initial purchase and on-going airtime charges. Think about installation help and support.

SSB Marine HF Radio

The daily SSB radio net is for many the highlight of the rally, proving the continued popularity of SSB with the cruising community, due to the versatility of the SSB radio. SSB radio enables direct communication with multiple boats over long distances with no airtime costs. Can also be used to received weatherfax using the PC sound card and suitable program.

Drawbacks of an SSB set are that a professional installation is extremely important; ensuring correct initial installation will give the best results particularly as far as the ground plate and aerial tuner are concerned.

Email over SSB radio is popular with cruisers. Interface a pactor modem, subscribe to an HF email provider and enjoy relatively inexpensive email from anywhere. All providers offer a 'Starter Pack' that includes the Pactor digital radio modem and first year's subscription. The leading service provider is SailMail, with around 20 stations worldwide, and good quality software. Subscription with SailMail is \$250 per year. Refer to individual provider websites for detailed price offerings.

See the Pactor website www.scs-ptc.com/dealers/ for list of worldwide dealers.

Radio Communications

Radio Courses
 ~ Long Range Certificate
 ~ Short Range Certificate

HF Equipment
 ~ HF Transceivers
 ~ Pactor Modems
 ~ Antennas
 ~ Weather
 ~ Email



www.yachtcom.co.uk
www.sailcom.co.uk
 01489 565100

Advantages	Disadvantages						
<ul style="list-style-type: none"> ● free to use (voice) ● low cost data (email) ● versatile - weatherfax, voice, email ● radio nets ● community of users ● GMDSS distress and safety function 	<ul style="list-style-type: none"> ● takes time to learn how to use ● email service is not 24/7 ● email is very slow ● installation is more complex than for satellite systems 						
<p>Internet Performance</p> <p>'bearable' - email only, no web browsing, text and small attachments</p> <p>send approx 5 typical emails per minute</p>							
<p>Headline Prices</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">iCom 802/801</td> <td style="width: 50%;">£2300 (\$2,300) including digital antenna tuner</td> </tr> <tr> <td>Pactor modem</td> <td>Approx £750 (\$1,000-\$1,300)</td> </tr> <tr> <td>SailMail subscription</td> <td>\$250/year</td> </tr> </table>		iCom 802/801	£2300 (\$2,300) including digital antenna tuner	Pactor modem	Approx £750 (\$1,000-\$1,300)	SailMail subscription	\$250/year
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SatComs: Mobile Handsets

Most cruisers choose either of two mobile handset satphones.

Iridium mobile handset (2.4kbit)

- Most popular device on the ARC
- Offers voice; simple (and slow!) emails. OK for weather GRIB files.
- Setup is relatively simple if you have good instructions, but it's not the same as home broadband, so support is very important
- Resale value after the trip has continued to remain very strong, so total cost of ownership is quite reasonable.
- Incoming calls free to receive
- Has text (SMS) message function
- Airtime is bought in minutes.
- Available as mobile handset or fixed installation. Handset must be used with external antenna to work below deck.



Internet Performance	
'bearable' - email only: text plus small attachments such as weather files. Can send approx 5-20 typical emails per minute	
Headline Prices	
Portable Iridium 9555	\$1,300
External antenna	\$ 550
Fixed Iridium (including antenna)	\$2,500
Per minute (voice or data)	\$1.50/minute (flat)

iSatPhone Pro (1.2Kbit effective)

- Very long connect times (up to 1 min of wasted airtime on each call)
- Half the speed of Iridium to send emails, so double the airtime cost to use
- Airtime prices have risen dramatically in the last year...
- Hardware prices are slightly cheaper
- No 'inexpensive' outdoor marine antenna
- Looks nice on paper, but most users are very unsatisfied in actual usage



Internet Performance	
Really too slow for useful email: Small text emails are possible. Send approx 1-5 small text emails per minute + 1 minute to actually connect. Weather emails unlikely to be satisfactory (3-10+ minutes for grib files)	
Headline Prices	
iSatPhone Pro	\$850 (deals available with service plan)
External antenna	\$1,800
Monthly subscription	\$0-60/month (discounts on handset)
Per minute (voice or data)	\$1.25/minute (depending on service plan)

Sat Coms: Fixed Installation

There are two choices offering relatively higher speeds for at sea data, but involve much higher capital and running costs than handset systems.

Iridium Pilot (128kbit)

Has become popular due to competitive pricing, but still over twice the price of a standard Iridium. Speeds are just about fast enough for web browsing and superb for regular email/weather use.

- Zero monthly line rental
- Much faster - approx. 50 x standard Iridium - so cheaper to download large files
- Simple setup - plug in a network cable
- Special offers for free voice calls
- Fixed installation with bigger antenna than Inmarsat Fleet BB.



Internet Performance	
Fast enough 128kbit/sec,	
Headline Prices	
Iridium Pilot	\$5,600
Per minute (voice)	\$1.05/min voice (flat) + up to 3,000 mins free voice calls with new equipment
Per minute (data)	\$7.50 - \$9.50/MB (depending on contract)

Inmarsat FleetBroadband (150-432Kbit)

Where the Pilot is "just" fast enough for web browsing, the FB is acceptable. So for business users who require some kind of internet access at any time, it is the better solution. Cost per MB for data is somewhat higher, and the minimum monthly commitment is greater, so really the cut off becomes users who must have that web access (or faster download speed) over price.

Users looking to average over \$1,000/month, the airtime prices are heavily discounted and this can be a very cost effective solution for higher rate users.

- voice, fax and data
- data billed by data usage
- 'always on' broadband connection speeds
- easy set-up and installation
- relatively cheap usage costs (no line rental)
- ideal for business use on a yacht
- incoming (received) calls are free



Internet Performance	
Fast! FleetBroadband 250 = 284Kbit/sec, FleetBroadband 500 = 432Kbit/sec to compare, low-end home broadband is perhaps 512Kbits/second	
Headline Prices	
FleetBroadband 150	\$6,200
FleetBroadband 250	\$10,800
Per minute (voice)	\$0.76/minute
Per minute (data)	\$12/MB

SatComs Summary

	Iridium	Iridium Pilot	Inmarsat FleetBroadband
Minimal	Basic Iridium 9555	N/A	N/A
1-10 (few) text emails, (downloaded 1-2x / day) Limited weather	Iridium + marine antenna (£30-50/month)	OpenPort (64Kb/s) (£0-40/month)	FB150 (150Kb/s) (£30-50/month)
Large Weather GRIBs Email attachments. Limited web browsing.	N/A	OpenPort (128Kb/s) (£0-100/month)	FB150 (150Kb/s) FB250 (284Kb/s) (£30-100/month)
VPN. MS Exchange. Office Intranet access	N/A	OpenPort (128Kb/s) (£0-300+/month)	FB250 (284Kb/s) (£30-300+/month)

Compression and Optimisation Services

Using an optimisation service will significantly reduce your data costs compared to a standard email provider such as Gmail.

Specialist services such as Mailasail or Oceans offer compression rates of 5x or greater, compared to standard data speed - effectively reducing the airtime costs by up to a factor of 5!

The most common form of wasted airtime spend is "accidents", where new users will allow "Windows Update" to accidentally spend several hundred dollars of airtime (sometimes repeated multiple

times). Most of these optimized products will also include firewall and other support to prevent this occurring.

Remember that service and support is important. It is an annual event to see a large proportion of users at the start of the ARC requesting help, often having saved a small amount by buying cheaper online, only to spend multiples of that in wasted airtime and frustration in setting up.

Useful Contacts

Satellite Systems

Iridium	www.iridium.com
Inmarsat	www.inmarsat.com
Thuyara	www.thuraya.com
Skymate	www.skymate.com
Thrane & Thrane	www.thrane.com

SSB Systems

iCom	www.icomuk.co.uk
Sailor	www.thrane.com
Furuno	www.furuno.com
Barrett	www.barrettcommunications.com.au
Pactor	www.pactor.info

SSB Radio Email Services

SCSmail	www.scs-ptc.com
SailMail	www.sailmail.com
SeaMail	www.seamail.org
Winlink (HAM only)	www.winlink.org

Equipment & Airtime

SailCom Marine	www.sailcom.co.uk
MailASail	www.mailasail.com
Yachtfunk.com	www.yachtfunk.com
Ocens	www.ocens.com
XGate	www.globalmarinenet.com
TechYacht	www.techyacht.com
Personal Satellite	www.skyhelp.net
AST	www.satcomms.com

Weatherfax

Bonito	www.bonito.net
Mscan Meteo Pro	www.mscan.com
JVCom	www.jvcomm.de
SeaTTY	www.dxsoft.com/seatty.htm
SailCom	www.sailcom.co.uk

SSB Radio Training

YachtCom (UK)	www.yachtcom.co.uk
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6. FRIENDLY AND FUN COMPETITION

Rally Divisions

The World Cruising Club normally organises the rally fleet into two divisions:

Cruising A timed class designed for fun competition that allows motoring with penalty. The participating yachts are given World Cruising Club handicaps prior to the start.

Open A cruise-in company. Participants in this class will not receive handicaps and will not be placed in results.

The competition is for fun and enjoyment with results calculated as an excuse to give away prizes, which will not always be for the first three places!

Each boat participating in the Cruising Division will be given a World Cruising Club TCF (time correction factor) or handicap prior to the start. This is used to provide a handicapping system for the event and allows reasonable competition between similar sized cruising boats, makes and models, of varying ages. The rating is based on boat information given by owners and is calculated using the normal parameters of yacht handicapping, including: length overall, waterline length, displacement, beam, draft, sail measurements [I, J, P, E] and an allowance for age. Please enter the data about your boat on the Boat Information page in the Members Area of the website. [See Preparations section page 8 for details.](#)

World Cruising Club Handicaps

In the Cruising Division your TCF (time correction factor) or handicap is a number used to adjust your elapsed time (total time taken for the crossing) to enable all yachts to compete on a fairer basis. For example, a boat with a TCF of 0.995 would have its elapsed time reduced by this factor, while a boat with a TCF greater than 1 would have the elapsed time increased.

The WCC Handicap is an easy to administer, self-measurement system which relies on information provided by skippers, which is then moderated by World Cruising Club. Participants should

remember that the competition is for fun and enjoyment. A level of sportsmanship and honesty is expected from skippers and crews in accurately providing yacht measurement details and in reporting the number of engine hours used.

The WCC Handicap is only as accurate as the information provided by the owner to WCC. Similarly, some boats are better suited to certain weather conditions, and could therefore have a more favoured passage when compared to other boats of a different displacement and design.

Boats not wishing to take part in the competition, and boats for which no measurements are received, will be placed in the Open Division.

Corrected Time

In the Cruising Divisions boats are allowed to motor for a limited distance, although use of the engine is penalized. Motoring is classed as the engine running with the gear lever engaged in 'forward', with the shaft and propeller turning. The following formula is used to calculate corrected time (CT):

Corrected Time

$$CT = [\text{Elapsed Time} + (\text{Engine Hours} \times \text{Motoring Factor})] \times \text{WCC TCF}$$

Where the Motoring Factor is a number between 1 and 2 depending on the average weather conditions encountered by the whole fleet during the rally.

Changes to Handicaps

At check-in each skipper will be given a copy of the measurements used for the TCF. All skippers are required to check and sign to confirm they are correct. Any requests for changes or review must be notified in writing by 1200 two days prior to the official start. No amendments will be accepted after this time.

