

# HOT BuOYS S.V. Rigging Part 1

A rig designed to:

- Suits owner's need;
- Suit the sailboat,
- Stand conditions;
- Use local available hardware



# The purpose of this presentation

Is to explain how:

- Basic objectives of a cruising sailor,
- Coupled with logic and live testing,
- Evolved into the rig I designed for HOT BuOYS



# Suit owner's needs



I am a cruising sailor who:

- Puts SAFETY FIRST;
- Has a small crew;
- Doesn't race;
- Wants to go to wind (upwind).

# SAFETY FIRST

## **Bermuda Rig:**

- Boom hits heads
- Manual jib sheets
- Compressed mast
- Jammed track cars
- Trained crew

When considering SAFETY FIRST, the Bermuda rig and large Marconi mainsail is perhaps not the safest alternative.

# **SAFETY FIRST shaped the rig**

## **Bermuda Rig:**

- Boom hits heads
- Manual jib sheets
- High tension rigging
- Jammed track cars
- Trained crew a must
- Unbalanced loads

## **HOT BuOYS Rig:**

- Boom eliminated
- 100% Self-tacking
- Low tension rigging
- No track cars
- Novice crew okay
- Balanced loads

# Downwind sails on Bermuda rigs

Many big-Bermuda rig sailors raise downwind sails to overcome two issues:

One sail does not act effectively for both upwind and downwind conditions.

When sailing downwind, the shape of the both the typical foresail and mainsail spills most of the wind. Only one side of these sails can be let out.

# Downwind sails safety issue



A fixed forestay forces crew to the bow to raise and lower sails.

Changing sails between upwind and downwind sails requires man power. The larger the sails the more man power required. These crew all risk injury or worse. Sails are damaged too.

# Cruising sailors have small crews



When sailing in far off exotic places, locating crew is a challenge.

A small team:

- Fewer hands;
- Limited sleep;
- Less experience

# “Adequately crewed”

So, How many sailors are needed to “adequately crew” a big Bermuda rig?

Was a retired couple in their 60's soon to be in their 70's adequate?

In the cruising community, you usually only see one retired cruising couple per multi-hull no matter the size of the sailboat or age of the couple.

# Cruisers don't usually race:

Not racing means:

- Safer crew;
- Safer boat;
- Smaller sails okay.



# The world's most boring sailboat

A crew member of mine once told me I had the “World's most boring sailboat.”

I've been on high “excitement” sailboats.

Boring is fine with me.

Not wanting to race my boat has greatly simplified everything. I would rather play the piano and read a book when cruising.

# Trimarans: Too stable?



My sailboat is a 65 foot long by 40 foot wide trimaran.

Because it is so stable, the original rig designer:

# Trimarans: Too stable?

The designer,  
Convinced the  
former owners to  
go with a massive  
Bermuda rig and  
full baton mainsail.



# Trimarans: Too stable?



Multi-hulls are wide and won't spill the wind during a heavy gust. Therefore, the mast and rigging must stand against peak gusts in a squall or typhoon.

# Trimarans: Too stable?



The designer told the former owners they can just reef down when the winds get high.

He sold them seven winches to control the sails. Hmm...

# Trimarans: Too stable?

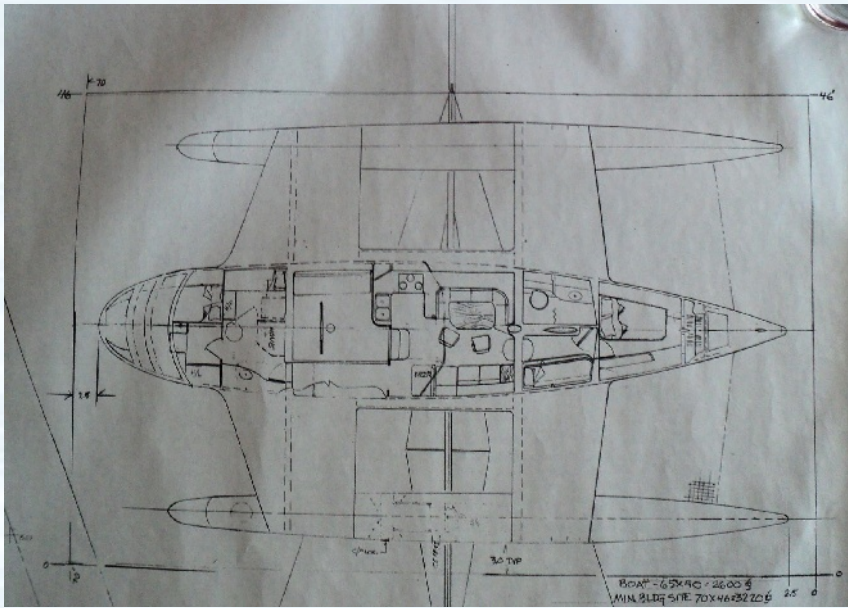
HOT BuOYS 40 ft beam = Stability  
Photo shows jury rigged mast used  
Mashall Islands to Thailand



The photo at left shows my sailboat with a jury rig I installed after the first mast came crashing down.

The former owners were in their 70's.

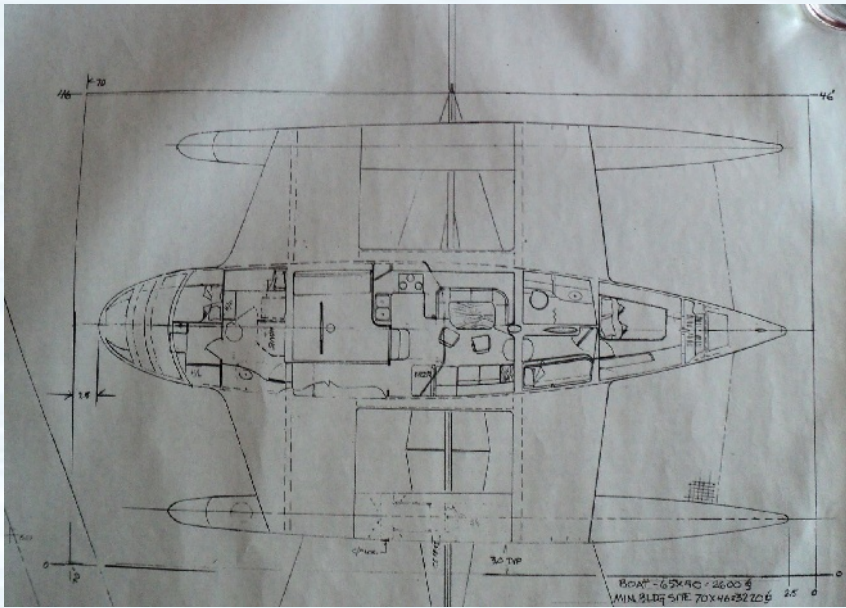
# Multihull tacking issue



When attempting to tack, large cruising multihulls tend to stall and fail to go through the wind. This is called being in irons.

A multihull's light weight makes doesn't have much momentum.

# Multihull tacking issue

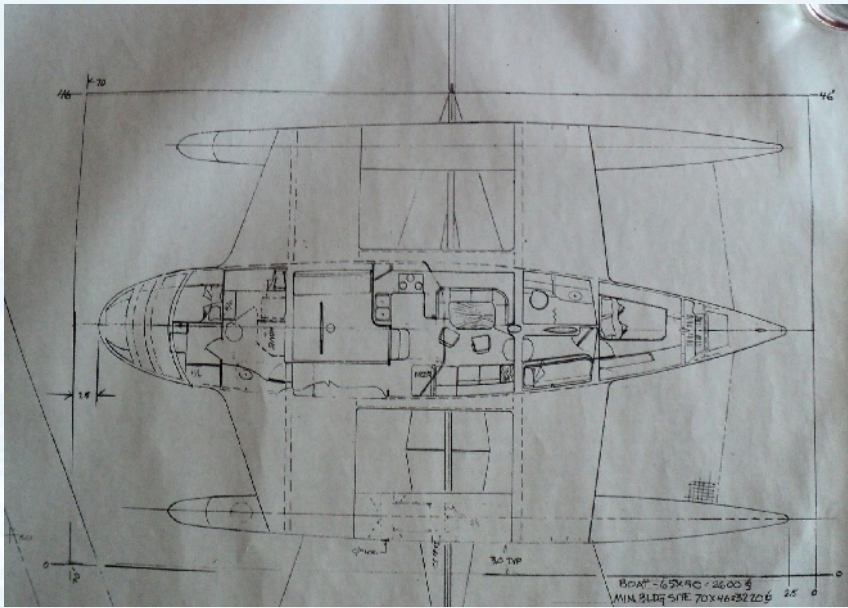


The longer it takes, and more often a sailboat tacks, the more the sails are flogged. Being in irons is hard on the sails and crew that have to run around and attempt to regain speed to attempt a tack again.

# Multihull tacking issue

To counter this issue, many multihull owners will turn on an engine to power the boat through the tack.

My trimaran could not tack without engine assist unless going very fast.



# The mainsail: Waste of money?



A mainsail to a cruising sailor is:

- A maintenance headache
- Safety concern
- Doesn't provide much speed

# The mainsail: A waste of money?



When I purchased my demasted trimaran, I examined the mainsail.

Over the years it was repaired and repaired.

Broken batons pierced the sail. Baton pockets were a mess.

# Serious consider maintenance

Visit any sail loft.

- Observe all the sails in for repairs.
- Are most mainsails damaged by batons?

Even brand new sails soon need maintenance. After just one month, when I was sailing a monohull, we were already resewing baton pockets.

# Look closer at the mainsail



A full baton mainsail, is an attempt to gain sail area away from the mast.

The mast is the problem. Even a rotating mast disturbs the airflow.

# The downside of batons



- Baton break and pierce the sail.
- Pockets wear out, cause turbulence.
- Baton cars are expensive and jam
- Sail harder to raise and lower.

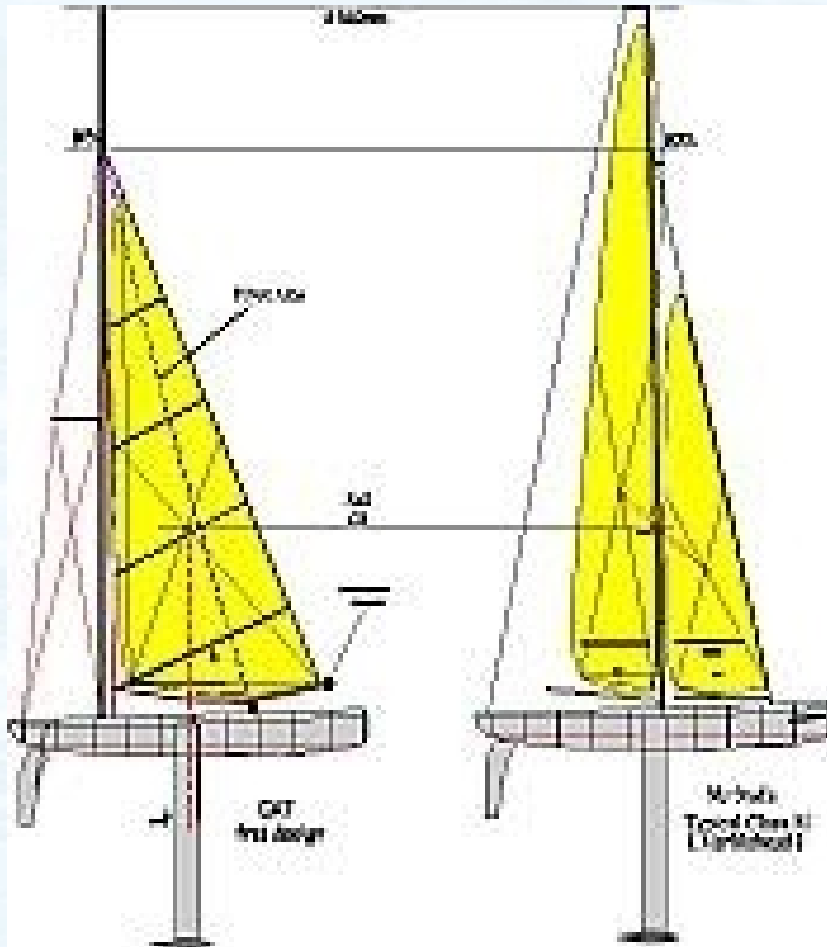
# Argument against the mainsail

Cruising sailors usually sail with big mainsails reefed or down completely.

They have neither the time nor crew to quickly reduce sail in a midnight squall.

Most cruisers wait and plan their routes for downwind sailing. Over 5 years, one cruiser reported just 10 days on the wind when a main would be best utilized.

# Why not eliminate the mainsail?



- Makes a safer boat
- Reduces mast size
- Simplifies
- Reduces expenses

No wasted sail area disturbed by mast.

# In places like S. E. Asia

Wind conditions are commonly either:

- No winds at all; or
- Strong sudden squalls.

Neither case justifies a big mainsail. The very tall mast used to fly a mainsail is a liability. Ask a trimaran owner here in the Philippines. He didn't even have a had no sail up when high winds took his tall rig down.

# Argument against the mainsail

## **SAFETY FIRST**

- A Bermuda rig mainsail requires a boom. Booms kill and injure sailors or sweep them off the sailboat into the water.
- Large mainsails require expensive baton cars. Despite their expense, mainsails still get stuck in the up position. This endangers crew, mast, and entire sailboat.

# Mainsail/Bermuda = Piano



A full set of Bermuda sails has so many lines to raise and adjust, that the group of lines leading to the cockpit is called the piano. On one sailboat I raced I counted 23 lines.

Novice and tired sailors tend to pull and release the wrong lines.

# Bermuda rig: Unhappy cruisers



- Ask long term big multi-hull owners if they are happy with a Bermuda rig.

*Anything ever go seriously wrong?*

# Bermuda rig: Unhappy cruisers



Look especially for the wide multi-hull owners.

One California based trimaran owner told me almost the identical story as the former owners of mine.

He too wished he never listened to a designer who said you just reef it in high winds.

## **“Terrified”**

The former owners of HOT BuOYS were terrified when they lifted the full baton mainsail fully. The boat went far too fast for their comfort and ability.

They didn't feel safe or in control.

So they always sailed on the third reef.

They purchased and kept a ladder aboard because of mainsail issues.

# **S A F E T Y F I R S T**

I am an engineer. It was my job to make the world's most dangerous things safer. I worked on nuclear power plants, petro-chemical plants, and boilers.

It is my contention that, if engineers that understand the concept of SAFETY FIRST were in charge of picking rigs for sailboats, that only well crewed big cruising boats would use Bermuda rigs.

# In theory versus in practice

In theory, a Bermuda rig on a multi-hull can go to wind. However, in practice, cruisers load it down with supplies. For safety, they only sail with a big Bermuda (Marconi) mainsail reefed.

Can a reefed mainsail on a multi-hull make windward progress?

# A rig designer should consider...



What the owners will be doing. What are they putting inside? HOT BuOYS' 150 HP engine weighs 1006 lbs dry weight. Were the owners planning to win races and needed a huge Bermuda rig?

# Cruising multi-hulls: To wind?

This is a challenge! Is there a cruising multihull larger than 45 feet that can make progress to wind when the mainsail is on the third reef and into opposing waves 2 meters or more.

If you just said to yourself that is an impossible challenge, perhaps you confirmed a Bermuda rig may not be the best choice for ocean crossings.

# If a rig doesn't get you home...

The former owners of my sailboat made multiple attempts to get to Hawaii and failed. From the Marshall Islands they needed to go to wind to get to Hawaii.

With their rig and the way they sailed it, they could not go to wind. A designer or end user mistake?

They were stuck for years. Eventually their attempts demasted the sailboat.

# A rig must suit the sailboat

When designing a new sail plan and rigging for an existing sailboat:

- You must examine closely the structural loading and existing boat strengths.
- You must reinforce areas as needed.
- You must also replace type for type. i.e. deck stepped mast, for deck stepped mast(s).

# Super typhoon Yolanda

Consider local conditions when designing a new rig. Super typhoon Yolanda tested HOT BuOYS' new rig shortly after it was up. Peak eye winds were 380 kph (235 mph). The eye missed a direct hit, however, trees at the marina in front and behind the sailboat were uprooted. As I update this presentation, another typhoon is 95 hours away.

# Hunkering down for Yolanda



HOT BuOYS rig is always ready for a typhoon. To prepare for Yolanda we put a few more lines to shore, and protected pilot house glass. Hot boy Reynon found the big yellow hat. The trees in background were downed by Yolanda.

# Summary 1

A rig designer should not cookie cutter a Bermuda rig onto every sailboat they design.

Instead, a rig designer should look carefully at the owners who will use the sailboat, consider their abilities, consider their goals, and the size of the sailboat.

## Summary 2

While a Bermuda rig when fully utilized may be fast and make windward progress, the problem with the rig for a cruising sailors is they have limited crew and/or desire to go fast.

Therefore, they tend to sail Bermuda rigs reefed down where they have trouble making windward progress. The merit of the mainsail becomes questionable.