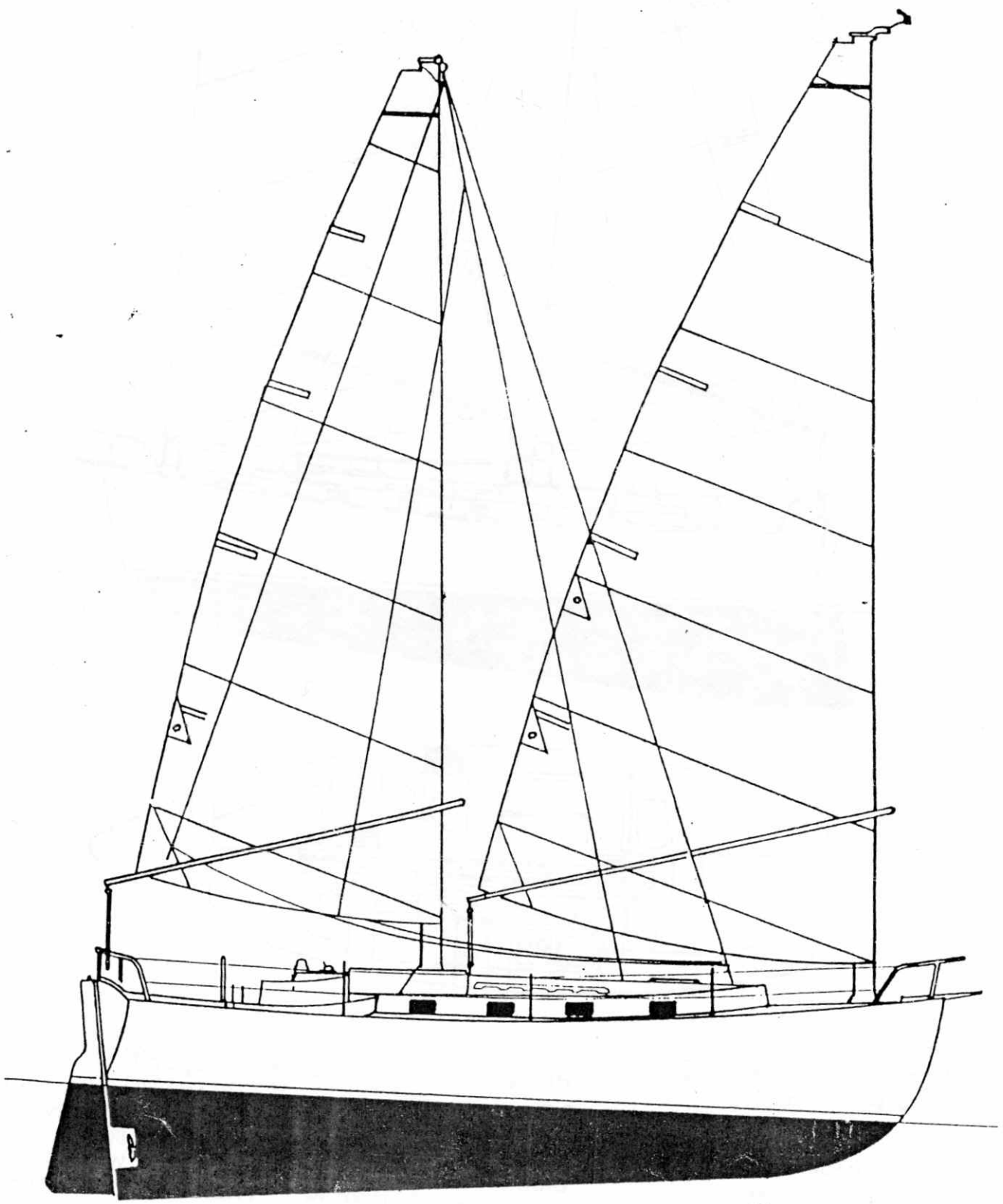
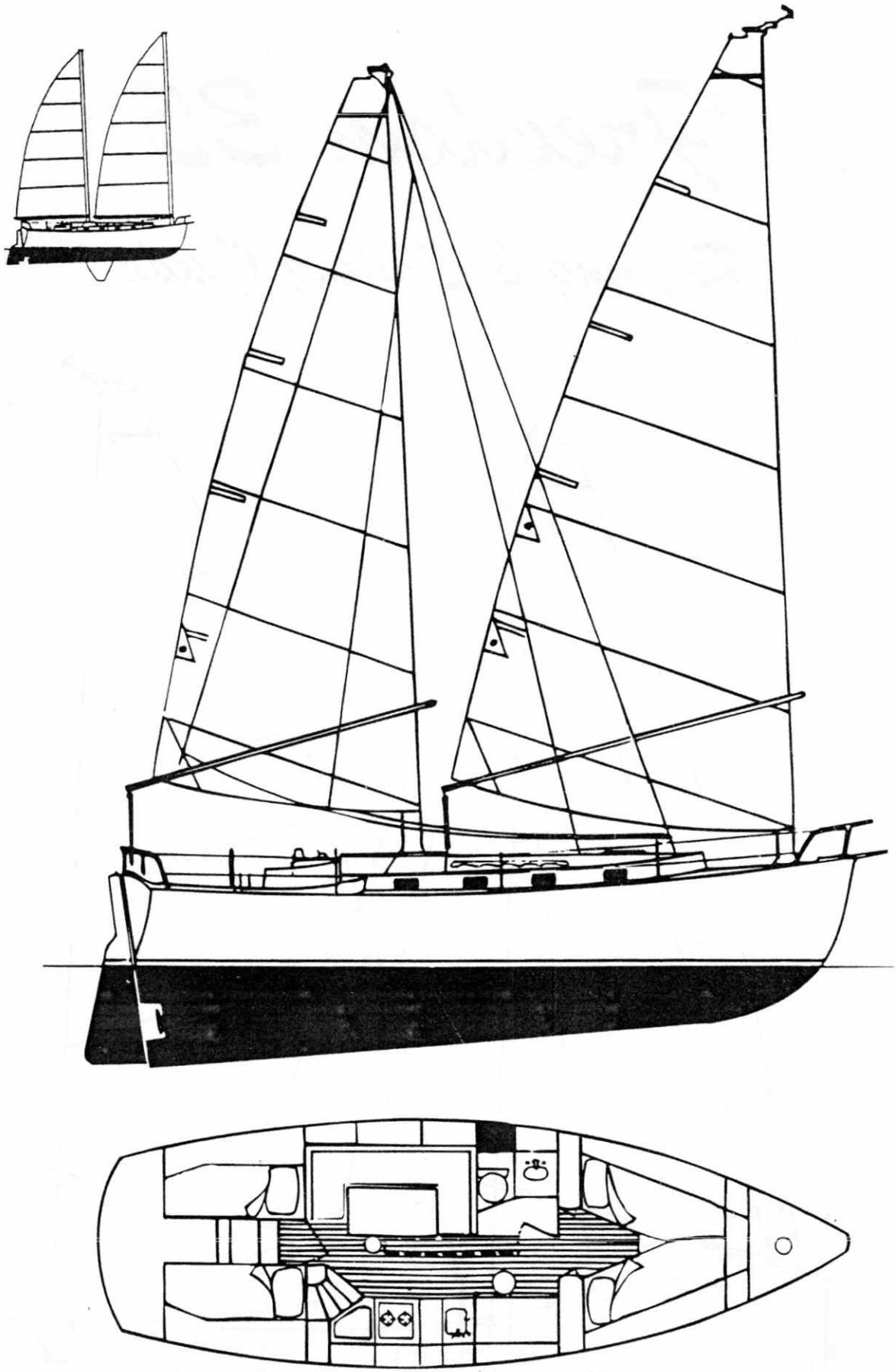
Freedom 35

Rigging & Sailing Guide





freedom 35

Wishbone or Fully Battened Rig
Long Keel or Centre Board
Five/Six Berths

Principal Dimensions and Capacities

L.O.A.	34′ 9″	SAIL AREAS:	MAIN	339 sq ft
L.W.L.	30′ 0″		MIZZEN	237 sq ft
BEAM	11′ 0″	TANKAGE:	FUEL	22 gallons
DRAFT	4′ 2″		WATER:	52 gallons
DISPLACEMENT	12,000 lbs	ENGINE		29 HP Diesel

RIGGING

All tackles, lines, strops and wires are supplied made up with the appropriate blocks, eyes, terminals and shackles, and are labelled. The rig should be assembled 9in the following sequence:

1. Rig booms as shown in Fig.1.

2. Place booms on deck over mast apertures. Ensure that they the correct way up (outhaul tackles on starboard side). Attach mainsheets to deck eye plates and/or travellers.

3. Attach downhauls and snap shackle blocks to mast collars as shown in Fig. 2. Slide mast collars, mast rings and rubber boots (with jubilee clips) onto masts (see Fig. 3.)

4. Rig masts as shown in Fig. 3.

5. Attach lifting strop to mast by rolling hitches below boom halyard eye plate.

6. Crane mast over boat, drop into mast aperture and locate in foot casting or over top hat moulding.

7. Align mast correctly. Main halyard, topping lift and boom halyard should face aft.

8. Lubricate mast ring with lanolin or washing up liquid and push down into mast gate until nearly at deck level. The taper on the ring may need to be trimmed to obtain a good fit.

9. Drop mast collar onto deck and align lugs correctly (see Fig. 2).

10. Drill deck for mast collar bolts. Tighten bolts to pull mast collar and ring down to deck level, onto sealing compound.

11. Secure rubber boot around mast collar with jubilee clip. Locate head lining trim ring over ends of mast collar bolts. (mizzen only)

12. Drill and tap through mast foot casing and fit retaining bolts to prevent mast rotation.

13. Run mast and boom tackles, lines, halyards etc. through mast collar blocks and deck leads to stoppers on deck. (see Fig. 4).

14. Unroll sail around mast and secure tail of outhaul line to clews with bowline.

15. Shackle boom halyard lower block to loop knot on yoke rope

16. Pass tails of yoke rope through apertures in sail, and temporarily make fast to forward radius of boom.

17. Shackle topping lift lower block to tang at aft end of boom and hoist boom clear of deck.

18. Hoist boom to horizontal position, (using boom halyard).

19. Adjust yoke rope until forward radius of boom is approx' 6" from forward face of mast, and loop knot is central on aft face of mast. Secure tails of yoke rope to boom with round turn through stainless steel loops and two half hitches.

20. Attach halyard bridal rope to head cringles in sail with bowlines or half hitches.

21. Knot all leech and foot ties (see Fig. 5).

22. Detach tail of clew reef line from boom, pass through both reef clews and attach by bowline around starboard wishbone, through stainless steel loop (see Fig. 1).

23. Knot additional sail tie through small eye in centre of sail and attach reefing penant as shown in Fig. 5.

24. Rig tack reef line as shown in Fig. 5. lead through mast collar and deck lead to stopper.

25. Hoist boom to a position above normal sailing position (using boom halyard).

26. Hoist sail until knots on bridle are close to masthead block (using halyard).

27. Lower boom until yoke rope 'floats' in centre of sail aperture.

28. Pass downhaul line (see Fig. 2) through sail tack ring, tension and secure to shackle with half hitches.

29. Check that yoke rope still emerges from centre of sail aperture. Adjust boom halyard if necessary.

30. Securely attach boom height limit strop (see Fig. 1) to mast collar to fix height of boom.

31. Adjust topping lift tackle and secure.

32. Cast off main halyard.

33. Lower boom to horizontal position.

34. Set up lower sail cradle by springing shockcord loops on starboard wishbone onto hooks on port wishbone.

35. Pull down remaining sail onto shockcord cradle. Spring upper shockcord loops over sail.

SETTING UP THE FREEDOM RIG

1. Ensure that the bridle halyards are attached to the head of the sail with short bowlines.

2. Hoist part of the upper element of the sail (do not take the weight of the boom on the sail).

3. Cast off the outhaul, reefing lines and sheet.

4. Mainsail: Tighten yoke rope until aft end of main boom is fairly close to the mizzen mast, but does not foul mizzen outhaul line. Check that yoke rope loop knot is central on aft face of mast. Make fast yoke rope on boom with round turn and half hitches.

   Mizzen: Tighten yoke rope as much as possible.

5. Hoist boom to approximately correct height.

6. Hoist sail until bridle bowlines are 3-4" from halyard double block.

7. Adjust boom halyarduntil yoke rope is in centre of sail aperture.

8. Tighten and make up downhaul at tack of sail.

9. Attach limit strop to mast collar (to fix height of boom).

10. Tension outhaul. If clew of sail comes block to block, yoke rope is not tight enough. Adjust as necessary.

11. Adjust topping lift (not too tight, weight of boom should be taken on sail leech)

12. Ease main halyard until the two reefing tack rings on the forward face of the sail are approximately 12" apart.

13. Tension reef tack line.

14. Tension reef clew line. Check at yoke rope position inside sail to ensure that reef tackle is not block to block. If tackle is block to block, shorten clew reef line at it's bowline attachment to starboard side of boom. Only shorten this line just enough to bring tackle off a block to block state. If the clew reef line has had to be shortened, re-hoist sail to ensure that the reef line is not too tight on reef clew. If this line is too tight, the depth of the reef must be reduced by easing the main halyard less (i.e. so that the reefing tack rings are more than 12" apart)

15. When the reef is satisfactory, mark the main halyard just aft of the stopper with an indelible marker.

16. Check that the reef pennant is correctly attached between leech and foot of sail and that it pulls down the excess material without fouling the reef clew tackle.

17. Re-hoist the sail to full height to check that no control lines are fouled.

18. At this stage, excess length may be trimmed from the outhaul, clew and tack reef lines, if necessary. Do not trim boom halyard.

19. Drop and stow sail. Take all loose control line falls hanging at foot of mast and stow inside sail. Do not pull these lines through stoppers into cockpit, as this will make re-hoisting the sail rather difficult.

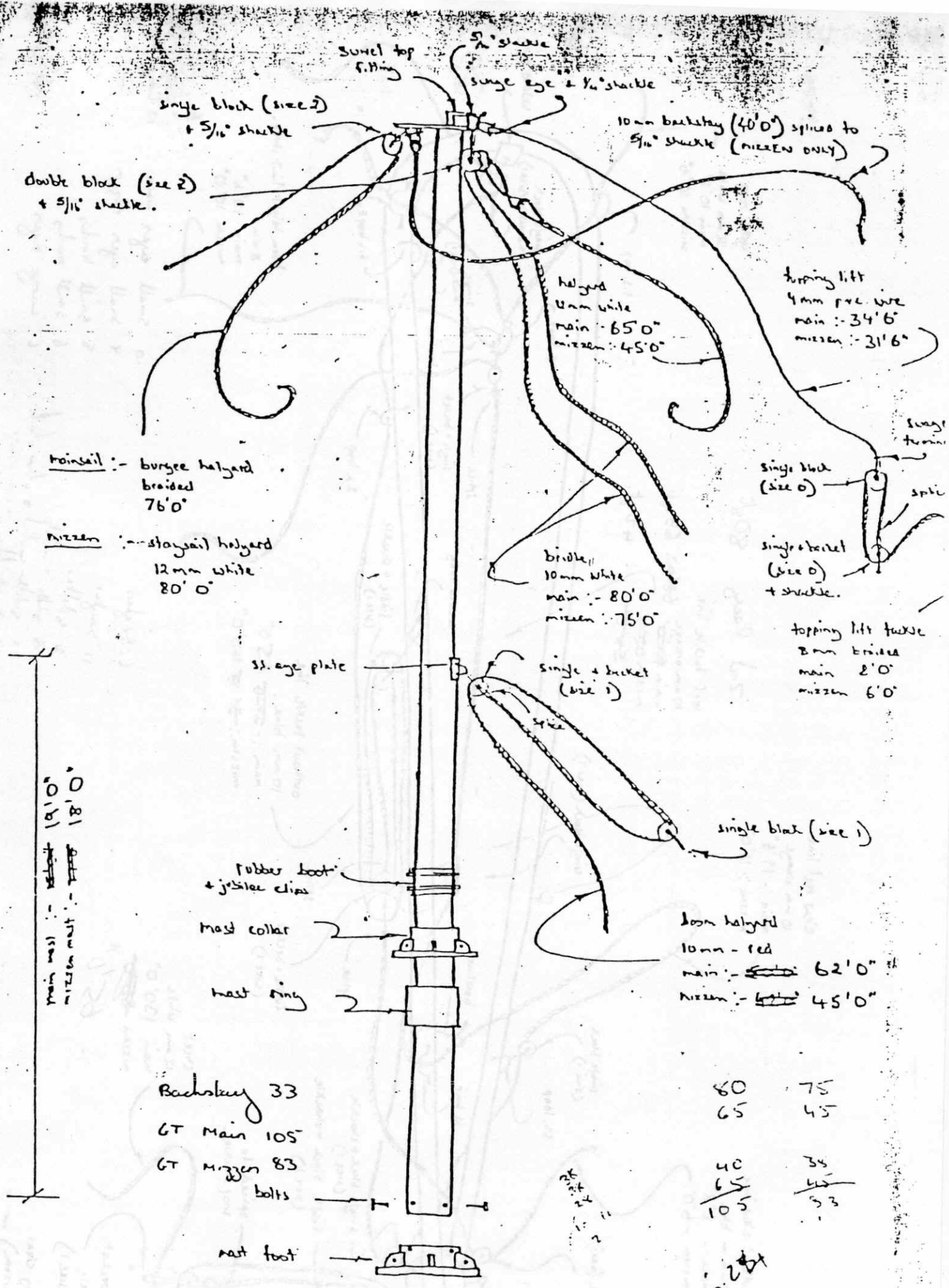
20. Trim excess length from boom halyard if necessary.

FREEDOM 35 WISHBONE RIG.

RUNNING RIGGING LIST

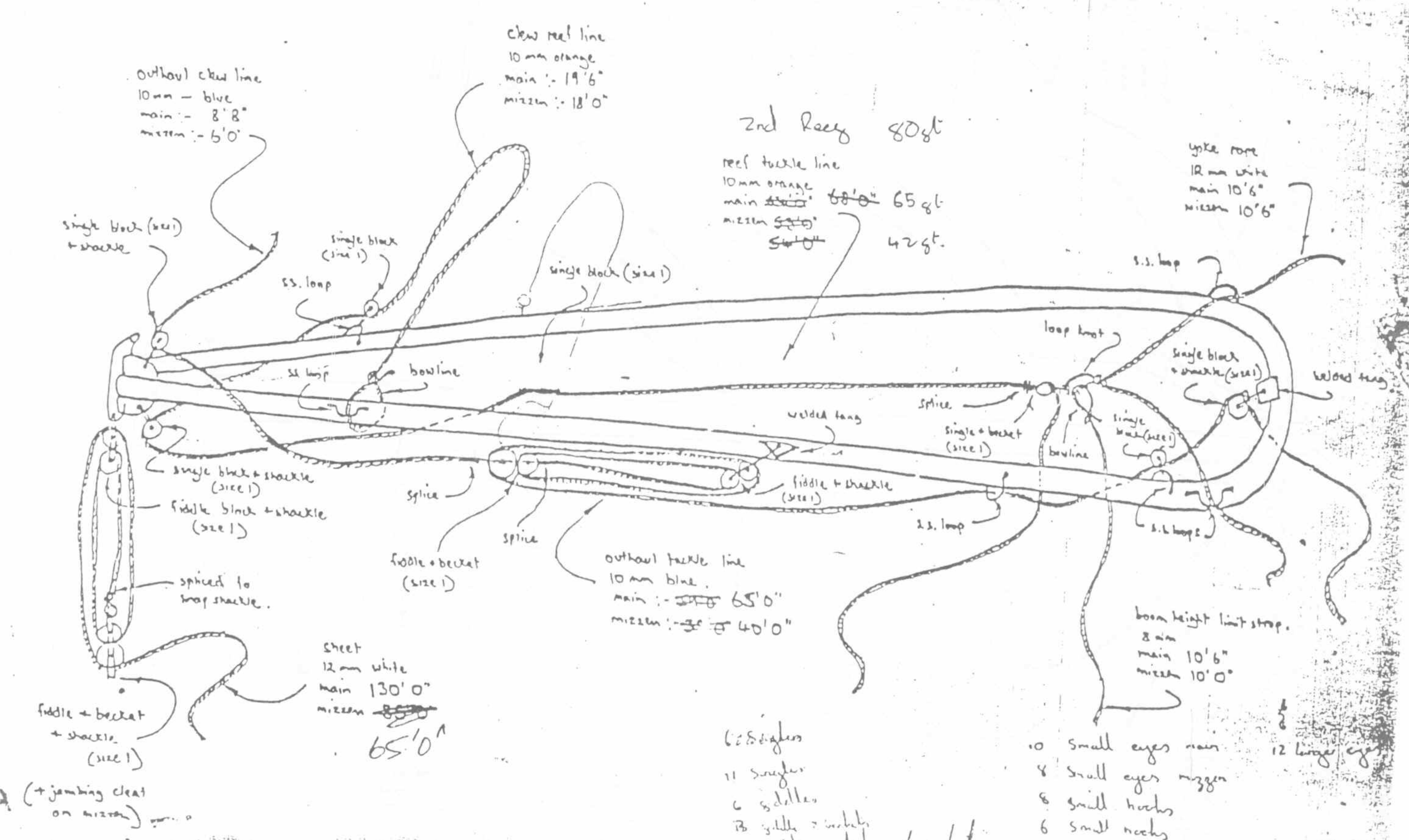
Main Halyard	10mm White Braid	105'
Mizzen Halyard	10mm White Braid	83'
Cruising Main Halyard	10mm White Braid	65'
Cruising Mizzen Halyard	10mm White Braid	45'
Cruising Main Halyard Bridle	10mm White Braid	80'
Cruising Mizzen Halyard Bridle	10mm White Braid	75'
Spare Main Halyard	10mm White Braid	105'
Mizzen Staysail Halyard	10mm White Braid	80'
Running Backstay	10mm White Braid	33'
Running Backstay Tackle	10mm White Braid	25'
Main Topping Lift	4mm PVC Wire	34'
Mizzen Topping Lift	4mm PVC Wire	31'
Main Wishbone Hoist	10mm Red Braid	62'
Mizzen Wishbone Hoist	10mm Red Braid	45'
Main Traveller Lines	8mm Orange Braid	2 X 22'
Mizzen Traveller Lines	8mm Orange Braid	2 X 10'
Mizzen Staysail Sheets	10mm White Braid	2 X 35'
Main Tack Strop	10mm White Braid	8'
Mizzen Tack Strop	10mm White Braid	8'
First Main Reef	10mm Orange Braid	65'
First Mizzen Reef	10mm Orange Braid	42'
Second Main Reef	10mm Red Braid	80'

Main Sheet	10mm White Braid	130'
Mizzen Sheet	10mm White Braid	85'
Main Outhaul Clew Line	10mm Blue Braid	9'
Mizzen Outhaul Clew Line	10mm Blue Braid	6'
Main Outhaul	10mm Blue Braid	65'
Mizzen Outhaul	10mm Blue Braid	40'
Main Limit Strop	8mm Orange Braid	11'
Mizzen Limit Strop	8mm Orange Braid	10'
Main Tack Reef Line	10mm Green Braid	48'
Mizzen Tack Reef Line	10mm Green Braid	25'



FREEDOM 33 – MASTS

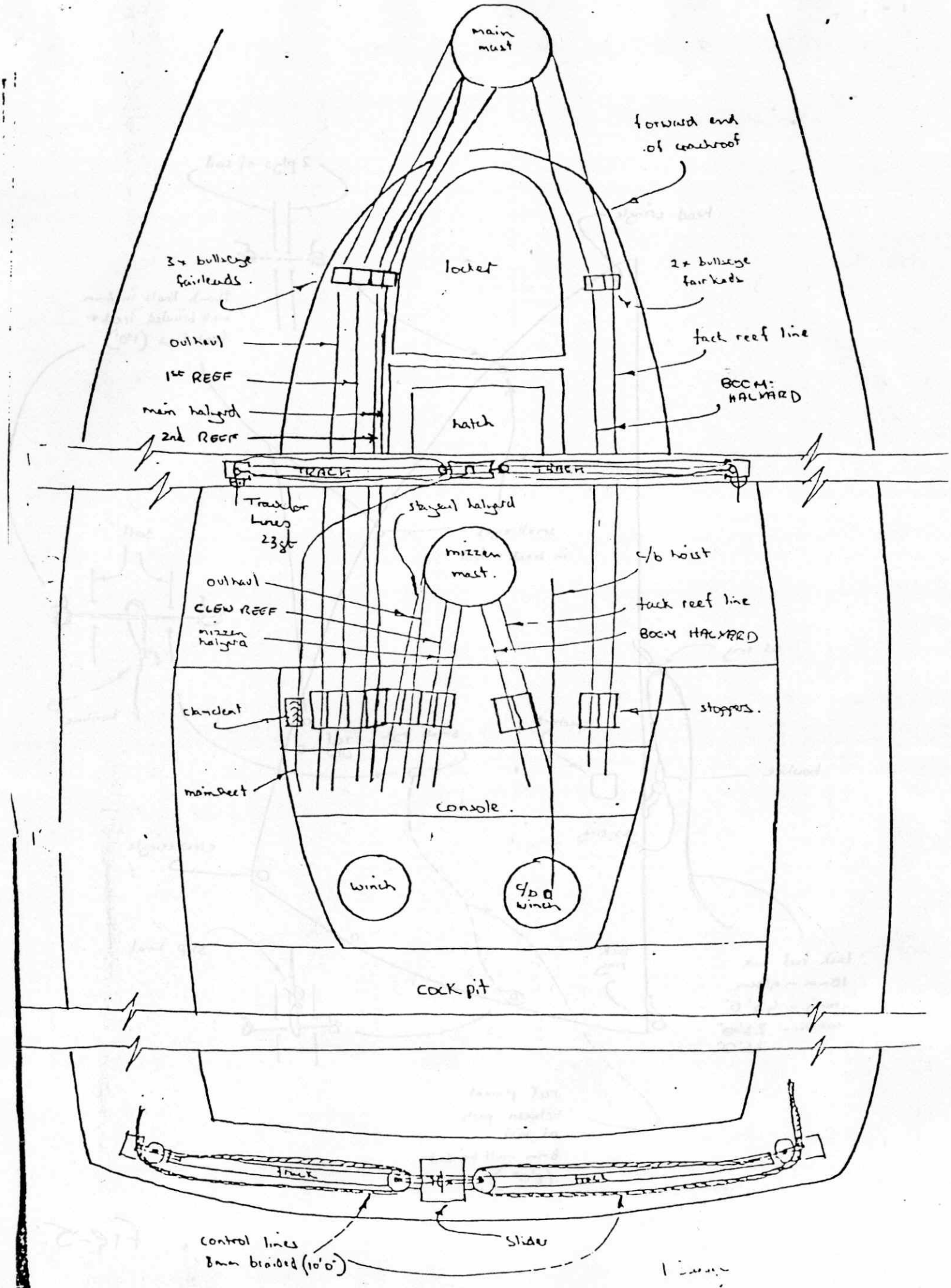
Fig. 3.



66 Singles
11 Singles
6 fiddles
13 fiddle + beckets
1 fiddle becket & clam cleat
12 S. Shackles

10 Small eyes main
8 Small eyes mizzen
8 Small hooks
6 Small hooks
6 Large eyes

12 Large eyes



FREEDOM 33 - DECK Fig. 4.

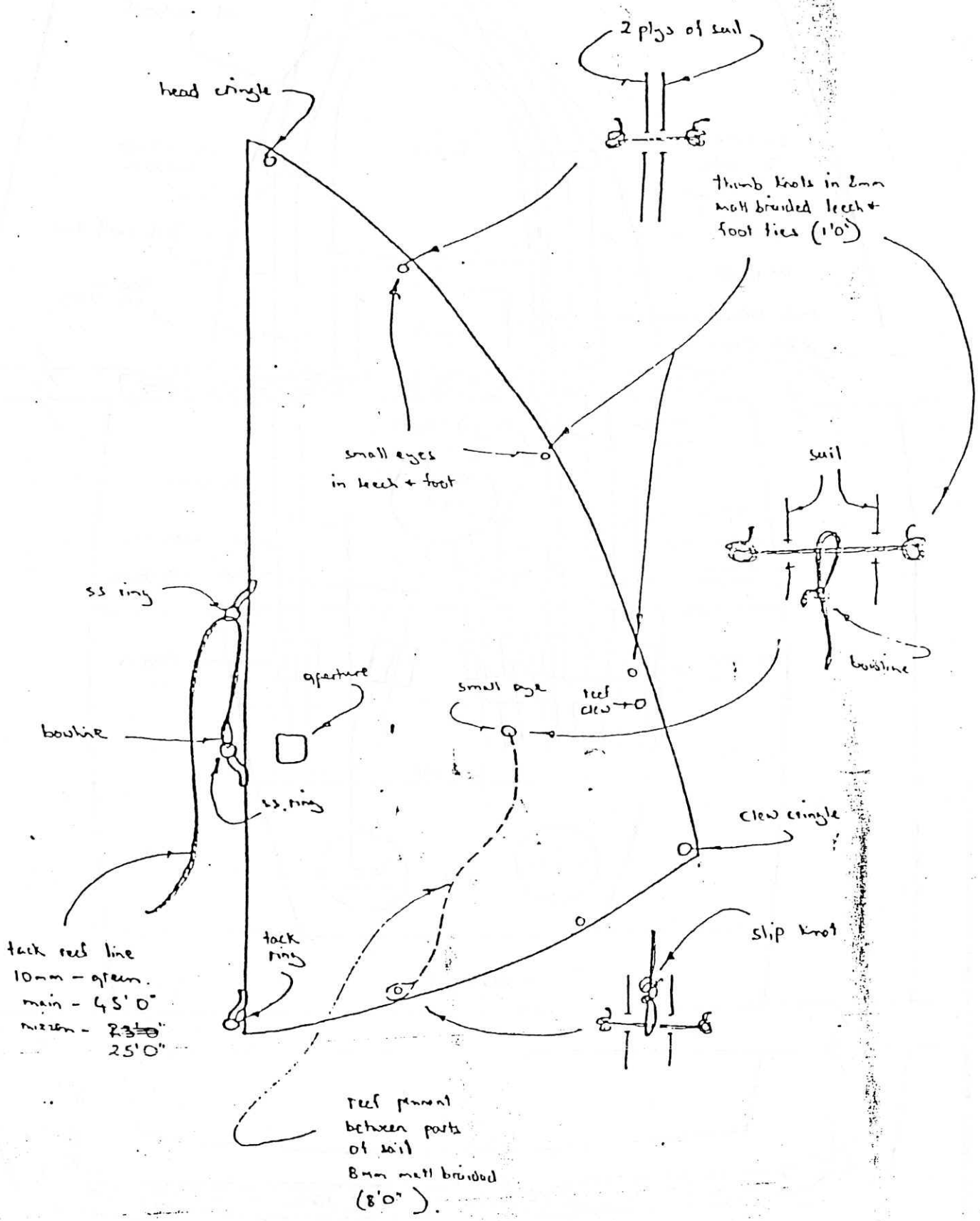
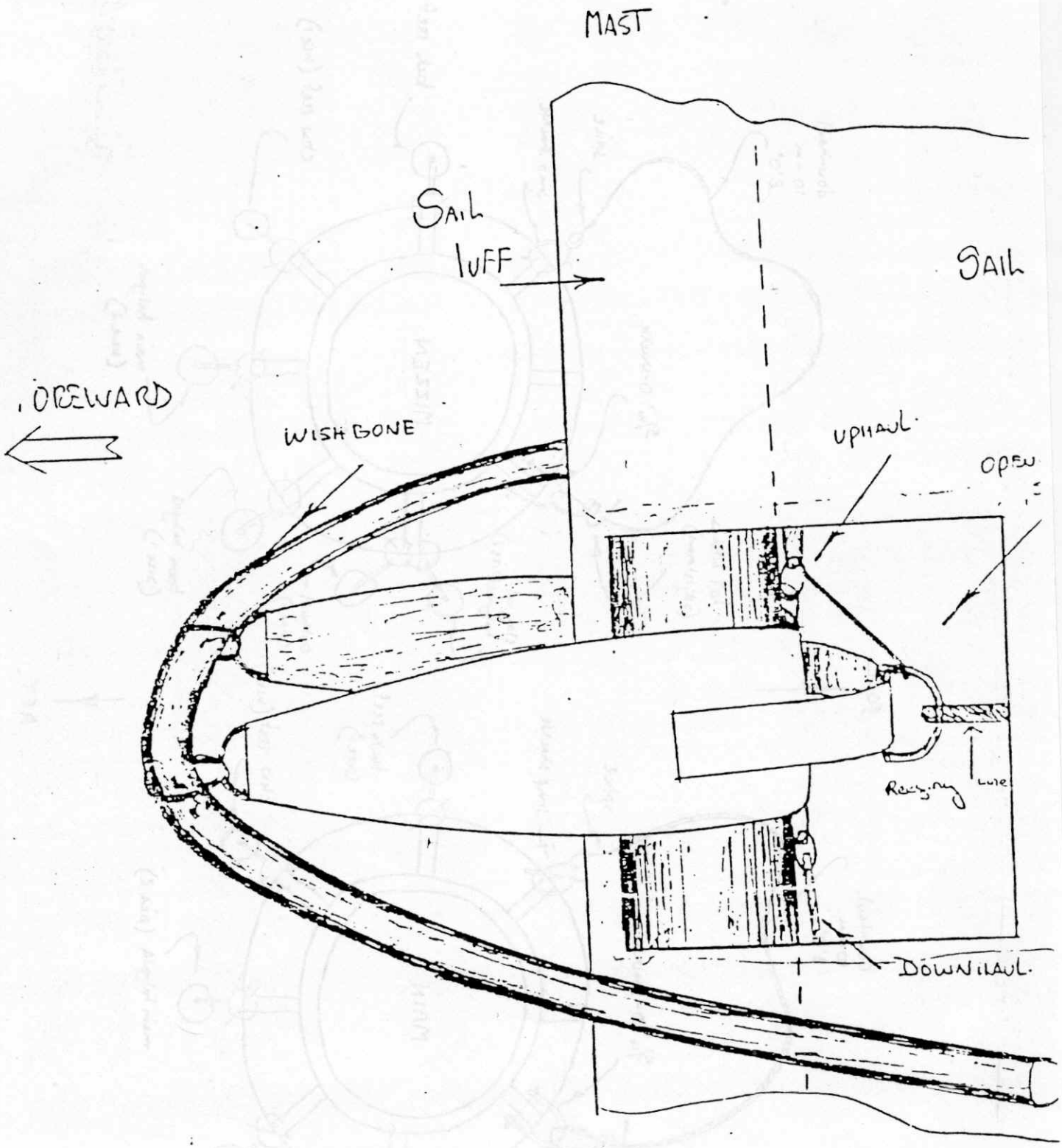
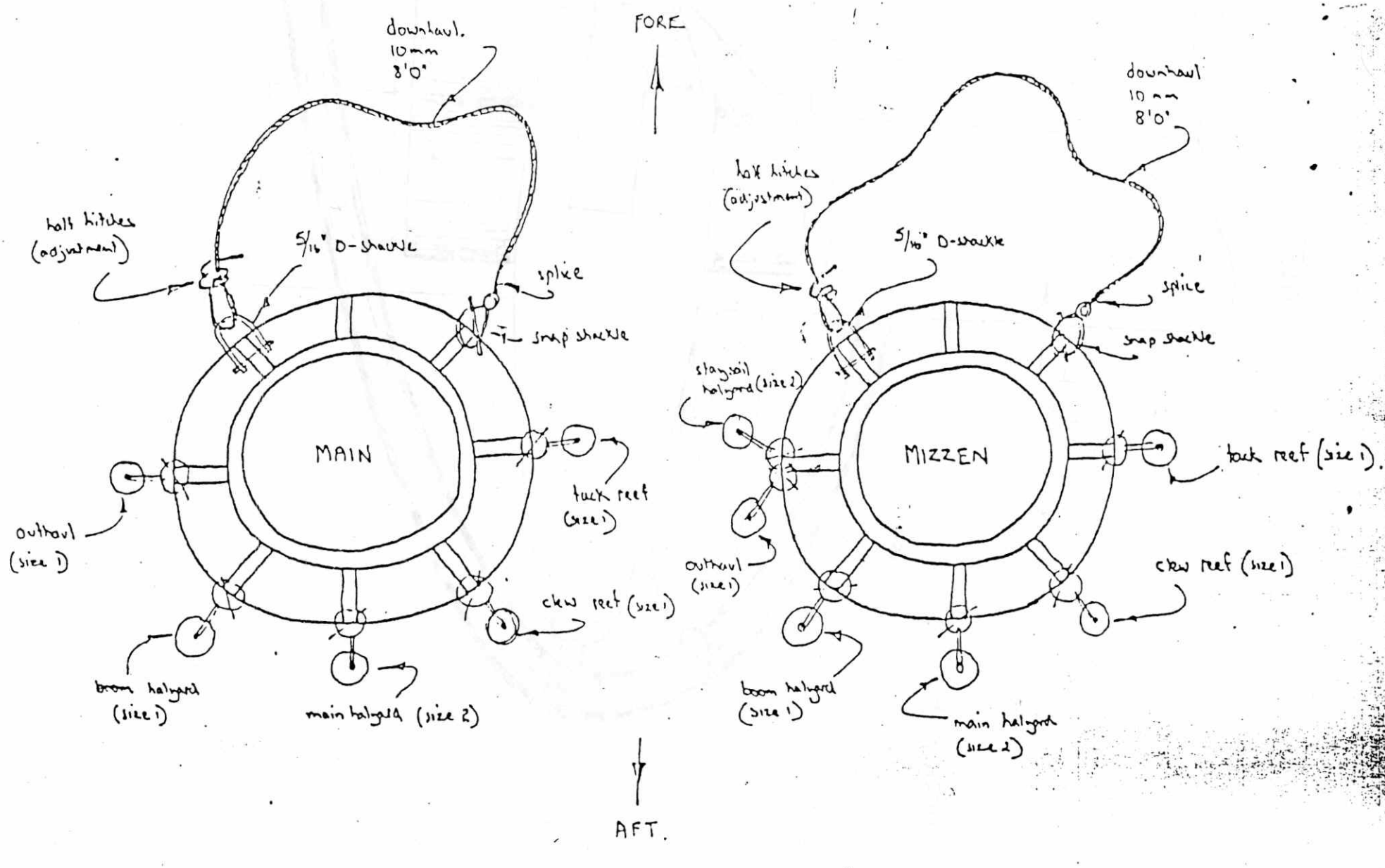

2 plys of sail
head cringle
thumb knots in 2mm
matt braided leech +
foot ties (1'0")
small eyes
in leech + foot
sail
ss ring
aperture
small eye
reef
clew
bowline
bowline
ss. ring
clew cringle
tack reef line
10mm - green.
main - 45'0"
mizzen - ~~23'0"~~
25'0"
tack
ring
slip knot
reef pennant
between parts
of sail
8mm matt braided
(8'0").

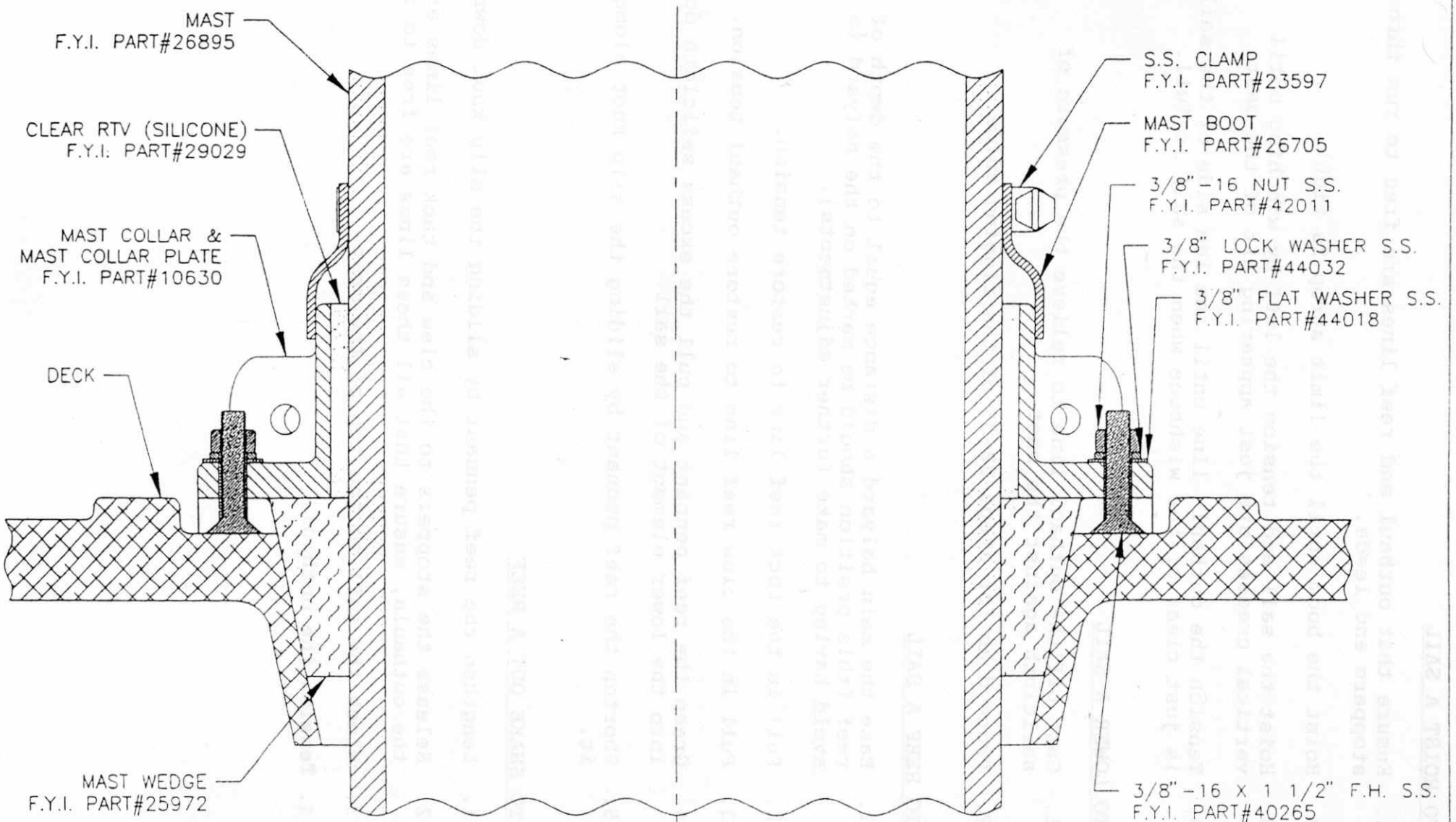
Fig-5.

M & W BRIDLE




FORE
downhaul
10mm
8'0"
bolt hitches
(adjustment)
5/16" D-shackle
splice
snap shackle
MAIN
tack reef
(size 1)
outhaul
(size 1)
clew reef (size 1)
boom halyard
(size 1)
main halyard (size 2)
AFT.
downhaul
10 mm
8'0"
bolt hitches
(adjustment)
5/16" D-shackle
splice
snap shackle
staysail
halyard (size 2)
MIZZEN
tack reef (size 1)
outhaul
(size 1)
clew reef (size 1)
boom halyard
(size 1)
main halyard
(size 2)

MAST COLLAR INSTALLATION DETAIL



F35P-OM\MASTCLLR
SCALE: 1" = 2"
1/27/93

TO HOIST A SAIL

1. Ensure that outhaul and reef lines are free to run through stoppers and leads.

2. Hoist the boom until the limit strop is tight

3. Hoist the sail and tension the luff by winching until vertical creases are just appearing aft of the mast.

4. Tension the outhaul line until the lee side of the sail is just clear of the wishbone when the sail is full.

TO LOWER A SAIL

1. Cast off the outhaul line to relieve the pressure of sailcloth against the mast.

2. Proceed as for steps 32-35 of the rigging guide.

TO REEF A SAIL

1. Ease the main halyard a distance equal to the depth of the reef (this position should be marked on the halyard to avoid having to make further adjustments).

2. Pull in the tack reef line to restore tension.

3. Pull in the clew reef line to restore outhaul tension.

4. Grasp the reef pennant and pull the excess sailcloth down into the lower element of the sail.

5. Shorten the reef pennant by sliding the slip knot along it.

TO SHAKE OUT A REEF

1. Lengthen the reef pennant by sliding the slip knot down.

2. Release the stoppers to the clew and tack reef lines and the outhauls, ensure that all these lines are free to run.

3. Winch the sail to the top of the mast.

4. Tension the outhaul.

BEATING

The mainsail should be sheeted as a genoa, i.e. the clew should not be sheeted further inboard than a position over the edge of the coachroof. The mizzen should be sheeted in as hard as is necessary to give the appropriate weather helm or 'feel' to the wheel.
The yacht should then be sailed at approximately 40 degrees to the apparent wind, depending upon sea conditions. Only experience will enable the helmsman to find precisely the right 'groove', but as a general rule a Freedom yacht should always be sailed slightly more free than a conventionally rigged yacht.
To tack, turn the wheel briskly and start to reverse the helm as the bow passes through the eye of the wind. It is not necessary to trim either sheet.

CLOSE AND BEAM REACHING

Ease the sails out parallel to one another until they are just on the point of lifting on their weather sides. In strong winds it may be necessary to ease the mizzen further to eliminate any weather helm. It is best to avoid the temptation to oversheet, as the two-ply sails are most efficient when set at a small angle of attack to the apparent wind.

BROAD REACHING

It pays to goosewing the mainsail as soon as the wind is significantly aft of the beam. Before bearing away, ease off the mizzen completely and run off slightly by the lee to place the mainsail in the wind slip of the mizzen. It is then possible to grasp all the parts of the mainsheet and pull the mainsail bodily over to weather. As the sail fills on the weather side , ease out the sheet until the boom is well forward of athwartships, and return to a boad reaching course.

SETTING THE MIZZEN STAYSAIL

This additional sail is usually set only when the wind is sufficiently far aft of the beam to goosewing the mainsail out to weather. Attach the tack of the staysail to the eyeplate on the forward end of the coachroof, or to weather mooring cleat, or the weather toerail. Rig up the running backstay to the mooring cleat on the weather quarter. Hoist on the staysail halyard, and sheet to a snatchblock from the leeward stern mooring cleat, or to the end of the mizzen boom.

RUNNING

With the mainsail goosewinged, ease both mainsail and mizzen well forward of athwartships. This technique results in three advantages:

1. Airflow from luff to leech is set up, increasing the efficiency of the acrofoil sails.

2. The possibility of an involuntary gybe is eliminated.

3. Lateral pressure on the sails damps rolling.

GYBING

To gybe the main, run by the lee and hand the mainsail over in the lee of the mizzen. To gybe the mizzen, sheet it in in the normal way and gybe the sail over with only a small divergence from a downwind course.

REDUCING SAIL

The normal sequence of sail reduction is as follows:

1. Reef the mizzen
2. Stow the mizzen (or reef the main)
3. Reef the main (or stow the mizzen)
4. Stow the main and set storm jib.

SETTING THE STORM JIB

1. Release the mainsail topping lift, lower the end of the main boom onto the side deck and lash in position.

2. Set up the running backstay to the weather quarter.

3. Attach the tack of the storm jib to the eyeplate on the forward end of the coachroof. Hoist on the mizzen staysail halyard and sheet to the leeward quarter.

TO HEAVE TO

Sheet the storm jib to weather and put the helm down. The yacht should then settle approximately 60 degrees off the wind.

The above techniques differ slightly from those employed on conventionally rigged yachts, but are easily mastered during the first few hours of sailing. When you are familiar with the system, we think that you will agree that it is the simplest and most efficient cruising rig available.

GOOD SAILING!

Freedom Yachts®

The following explanations and advices may be applied to either the Freedom 40, Freedom 33, or Freedom 28 since all these designs employ the same free standing Cat Ketch Rig, and the hulls behave in basically the same way.

The Free Standing Spars

You may recall that airplanes started out with stays, but have long discarded them for reasons of aerodynamic efficiency and safety. To have wings which depend on a maze of connected wires is simply not practical, for if one fitting fails, off comes the wing and down goes the plane. Which is exactly what still happens on today's so called modern stayed sailboat rigs. My conviction is that it is far more sensible to do just what they did with airplane wings - make the mast strong enough in the first place, fasten it well, and forget about stays.

Consider that in 5 years of sailing with over 100 Freedom Yachts - including passages across the Atlantic, Pacific, and through hurricanes - we have not yet lost one spar. Obviously sooner or later some damn fool is bound to break one - but no stayed masts can come close to that proven record of safety at sea.

The free standing spar is a simpler, more reliable way of achieving what regular masts attempt to do with spreaders, bob stays, back stays, hydraulic pumps and general confusion.

The Wraparound Sail

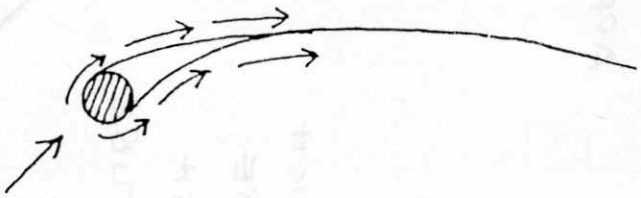
We know from wind tunnel tests and practical experience that any sail placed behind a mast is woefully inefficient, because the mast distorts and detaches the air flow around the vital leading edge. An airplane wing with that kind of airfoil would never get off the ground. The poor performance of masted sails is charitably disguised by the relatively good performance of jibs - but jibs require a tight forestay, which requires a tight backstay - which requires a hydraulic pump - which places enormous compression loads on the mast - which frequently breaks. All of these elaborate evasions of common sense live in the house that IOR rules built.

The traditional approach of the stayed mast is to use an oval section with a groove or a track on the trailing edge. The trouble with this is that the only time the oval mast has any semblance of aerodynamic efficiency is when the boat is at anchor, headed into the wind. All the time that it is sailing the fixed oval mast is not facing the right way.

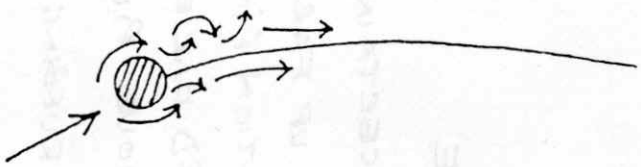
And of course tracks or grooves involve constrictions which have an unhappy flair for jamming up at the least desirable moment.

The wraparound sail is my solution for removing any possibility of the sail getting jammed in the mast, while at the same time creating a rotating airfoil that is always in line with the wind.

You get this:



Instead of this:

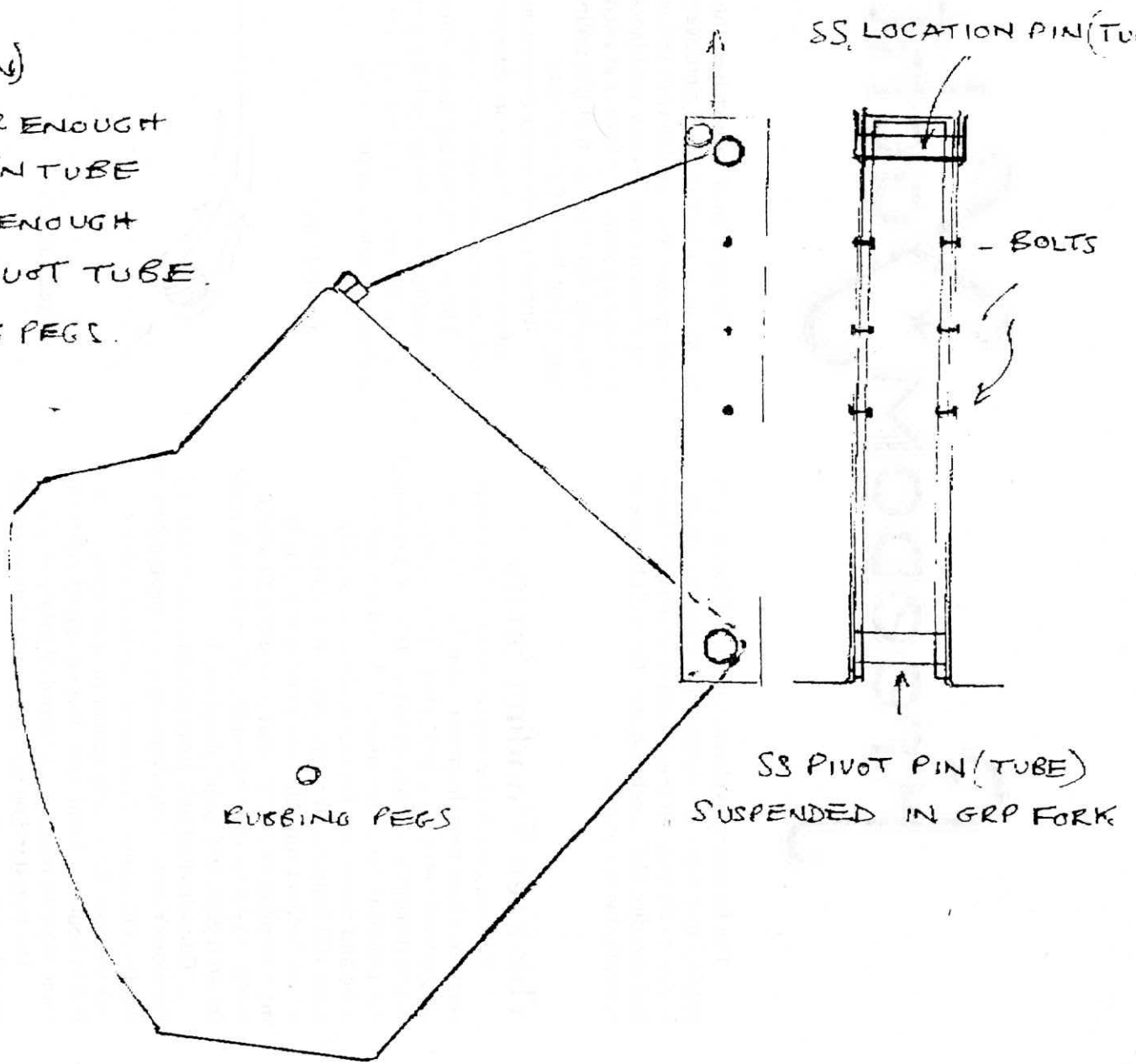


Due to the complete absence of fittings and constrictions - all you have to do is release the halyard and the outhaul - and the wraparound sail will slide down freely of its own accord. The wear between the smooth mast and the slippery dacron is minimal - far less than that normally associated with conventional sail slides or bolt ropes. Being a double sail, putting it on and taking it off is more difficult than with a conventional single-ply sail. But presumably you only do that once or twice a season. The end result is a clean aerodynamic sail which sails better, handles easier and wears longer.

APPLECRAFT LTD 19-3-96

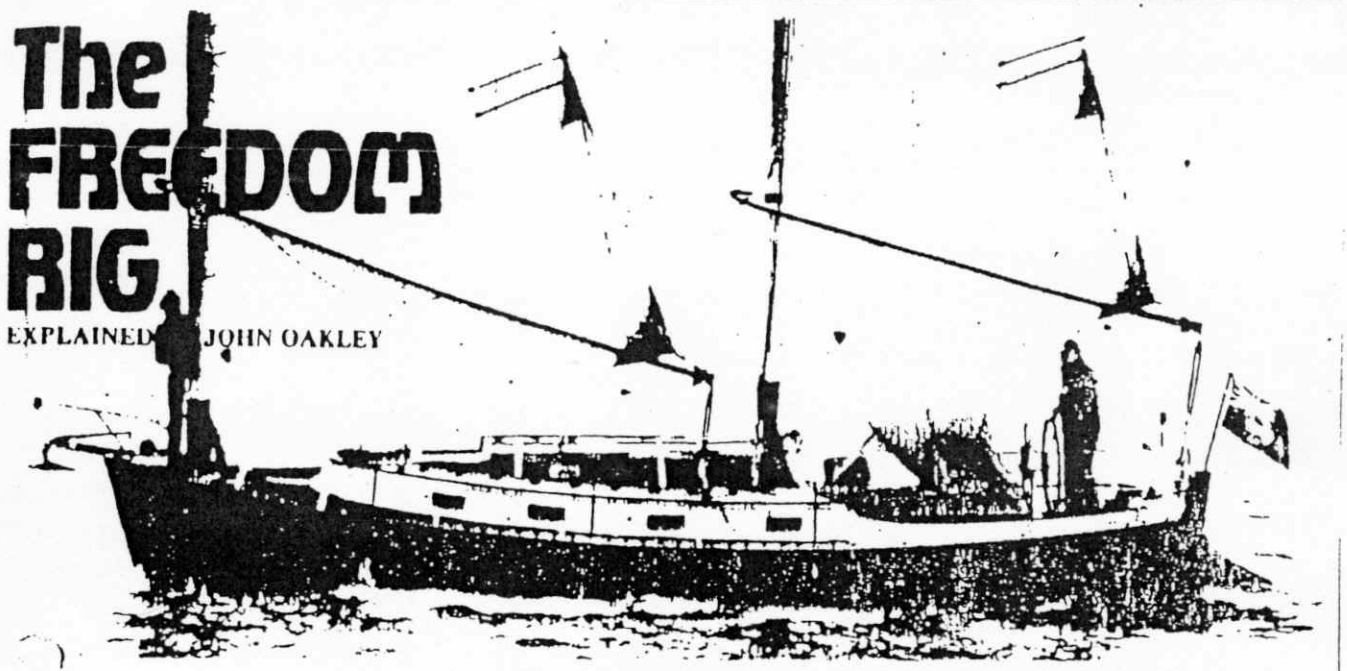
TO REMOVE:

1) TAKE TOP OF CB CASE
2) REMOVE BOLTS (NO. UNCERTAIN)
3) LIFT FORK STRUCTURE UP FAR ENOUGH TO REMOVE TOP, LOCATION PIN TUBE
4) LOWER FORK AND BOARD FAR ENOUGH OUT OF BOAT TO REMOVE PIVOT TUBE.
5) CAREFULLY, DONT LOSE RUBBING PEGS.



The FREEDOM RIG

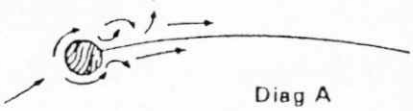
EXPLAINED — JOHN OAKLEY



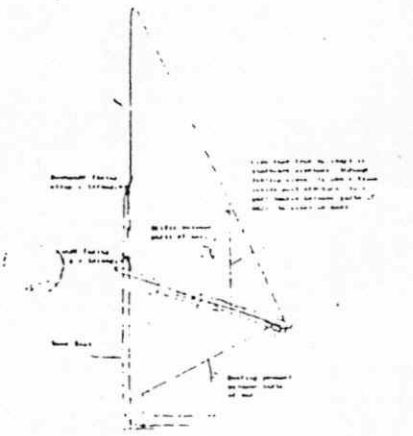
Miss Alfred Marks one of 3 Freedom rigged yachts entered in the Observer/ Europe 1 Transatlantic Race and one of only 8 all female crewed entrants.

You get this:

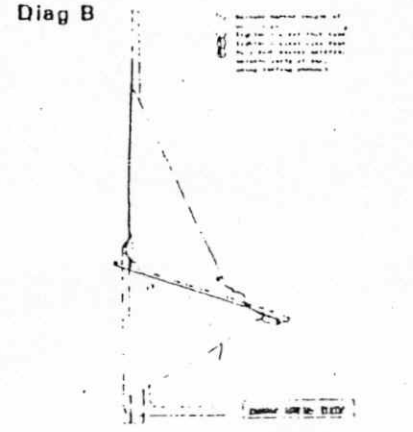
Instead of this:



Diag A



Diag B



When I first saw the Freedom 40, about 4 years ago, I thought what a magnificent looking boat, but I must admit I did have my doubts about the rig because I was used to using finely tuned, aluminium spars. Or was it that I just disliked the look of that large unstayed mast? Anyway, any doubts that I had were soon removed when Fairways loaned me a 33 for the 1980 Round the Island race, which we won. I was utterly taken aback; how could such a large comfortable hull go so fast? So I had another look at the rig and remembered that if you move the mast away from the leading edge of a sail the efficiency will reach heights previously unkown. Well the wrap around sail does just that; it uses the mast as the leading edge of an aerofoil and the leward section of the sail has a greater curvature to it than the windward surface which gives it its perfect aerofoil section. (See diagram A).

Sailing with this rig one finds that it is really efficient from 3 knots of wind right up to 33 knots (in the summer). This range of wind can be catered for without reefing; as the wind increases, one eases out the sheet until the wishbone ends are over the side of the boat, (like you would a Finn or an OK or Laser dinghy). In fact, you can feather the boat going to windward. Once you reach a wind strength when you have to reef it is a very simple matter as it is like a Jiffy reef on an ordinary mainsail (see diagram B). Incidentally at the London boat show we were practising reefing a Freedom Mizzen (which is quite a big sail) and we eventually got the time down to 6.5 seconds. Admittedly this was in no wind, but it just shows how easy it is to do it.

The Freedom rig allows you to do things that are impossible with a conventional rig. As an example, you can come into your mooring with the wind aft of the beam without lowering the sails; you simply ease out the Mainsheet and Mizzen sheet until the wishbones are forward of the mast and flapping. You can also leave the mooring in this manner. You can gybe without first having to pull in the mainsheet, I have gybed all standing in 40 knots, although I blinked waiting for the visual crash of the boom reaching the shrouds. But with the Freedom rig there is no noise at all, all that happens is that it ends on the other side of the boat just flapping with no weight on the Mainsheet at all. Then it is a very simple matter of just pulling in the Mainsheet until you start sailing again.

When reaching or running you have the Mizzen out on one side and the Mainsail out on the other. In fact, reaching it is well worth letting the Mainsail go forward of the mast on the windward side, rather like reaching with a spinnaker up when the spinnaker boom goes almost up against the forestay. In between the Mizzen mast and the Main mast you set a Mizzen Staysail which really is the only extra sail you need on board.

I think that the most noticable thing about the whole rig is that when it is blowing how quiet it is on board and down below; there is no howling of the wind in the rigging, there is no drum effect on the hull through pumped up backstays and tight shrouds, there is no slacking of headsails or winding of Genoa sheets, there is no flapping of slides in their tracks — just the noise of the water against the hull.

Performance wise against a conventional boat below 10 knots of wind to windward, when the other boats can set large light weather Genoas, the Freedom rig barely holds its own. Once the wind is over 10 knots however, going to windward, then there is no trouble what so ever and off the wind in any wind strength there is absolutely nothing of similar size that will stay with it.