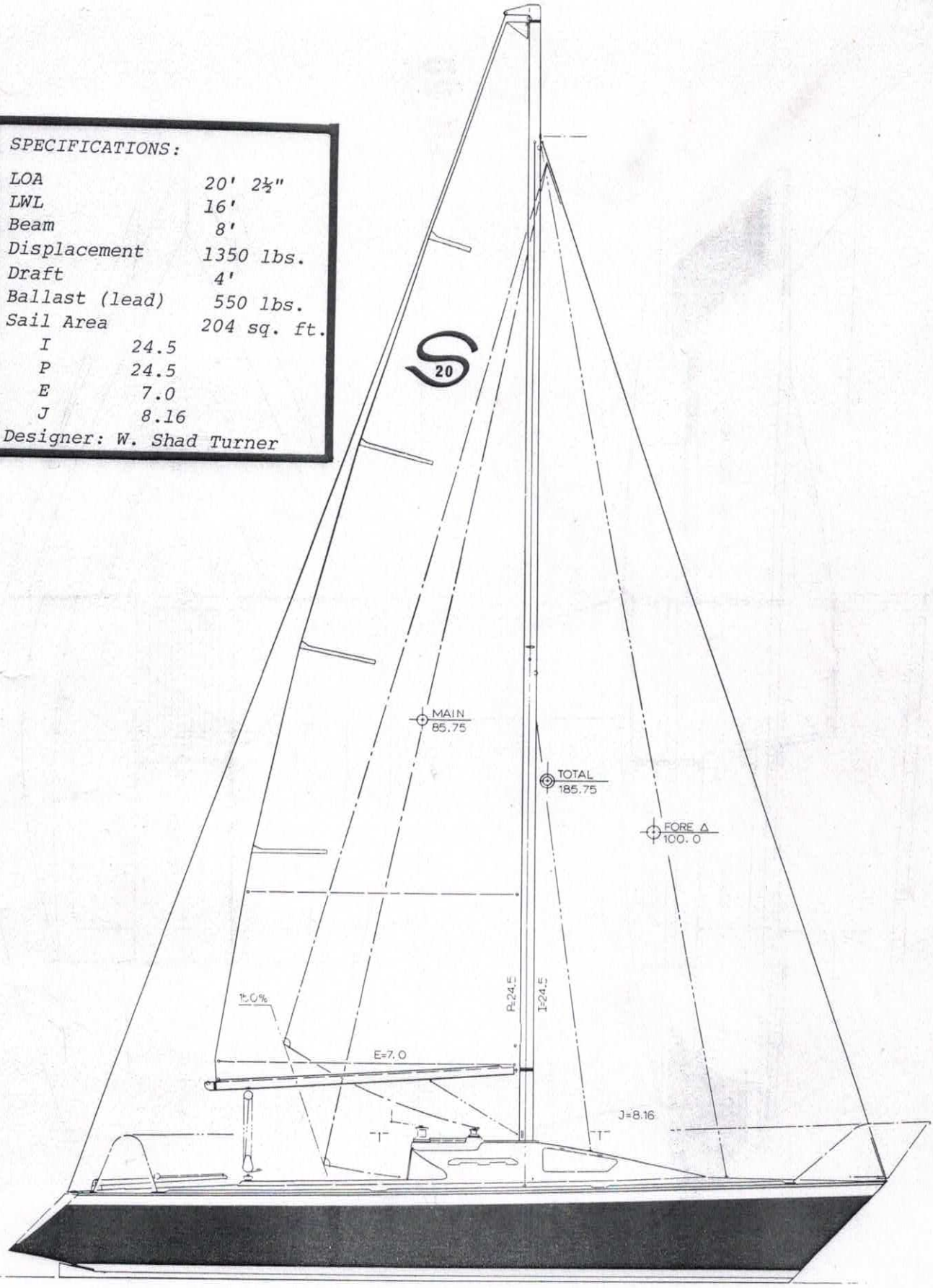
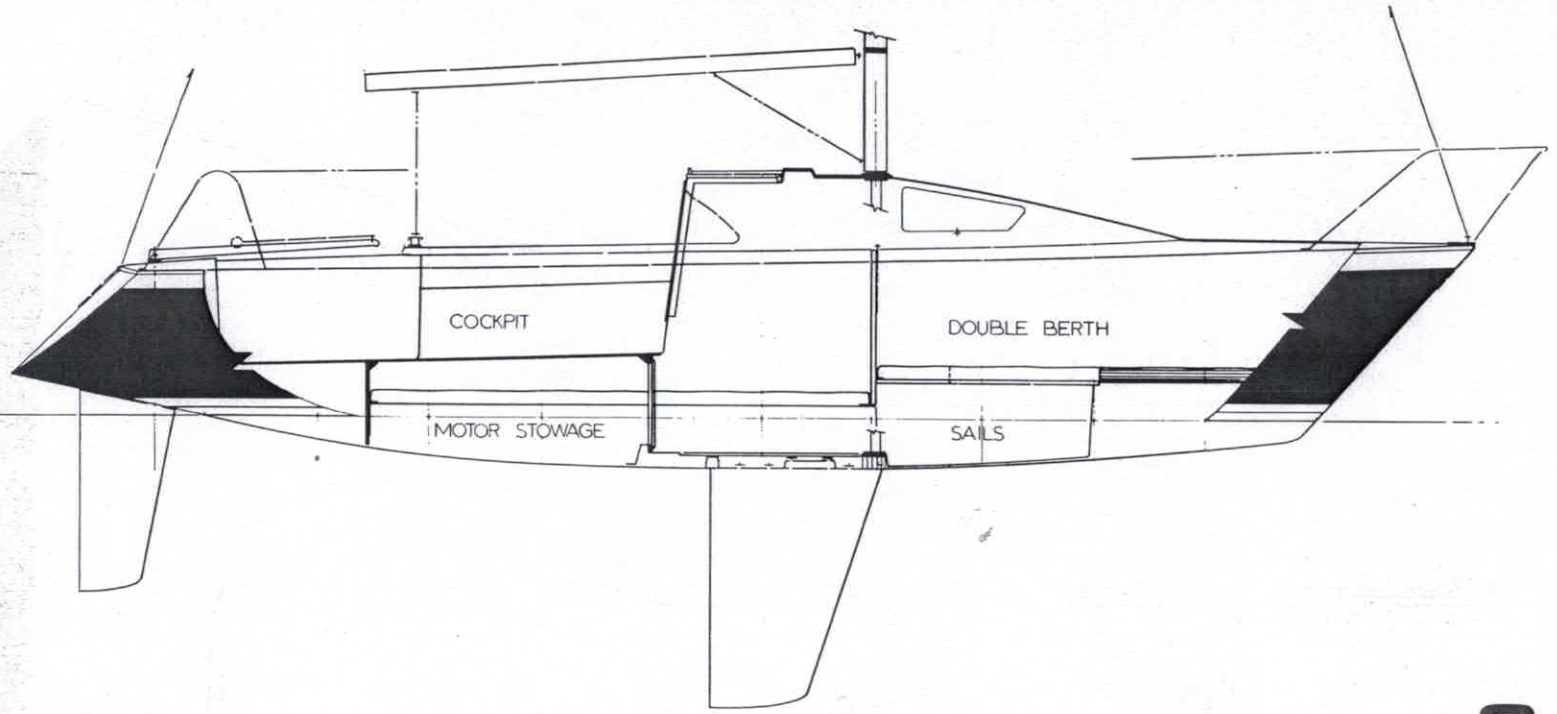
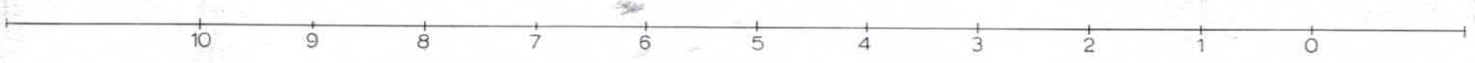
SPECIFICATIONS:

LOA	20' 2½"
LWL	16'
Beam	8'
Displacement	1350 lbs.
Draft	4'
Ballast (lead)	550 lbs.
Sail Area	204 sq. ft.
I	24.5
P	24.5
E	7.0
J	8.16

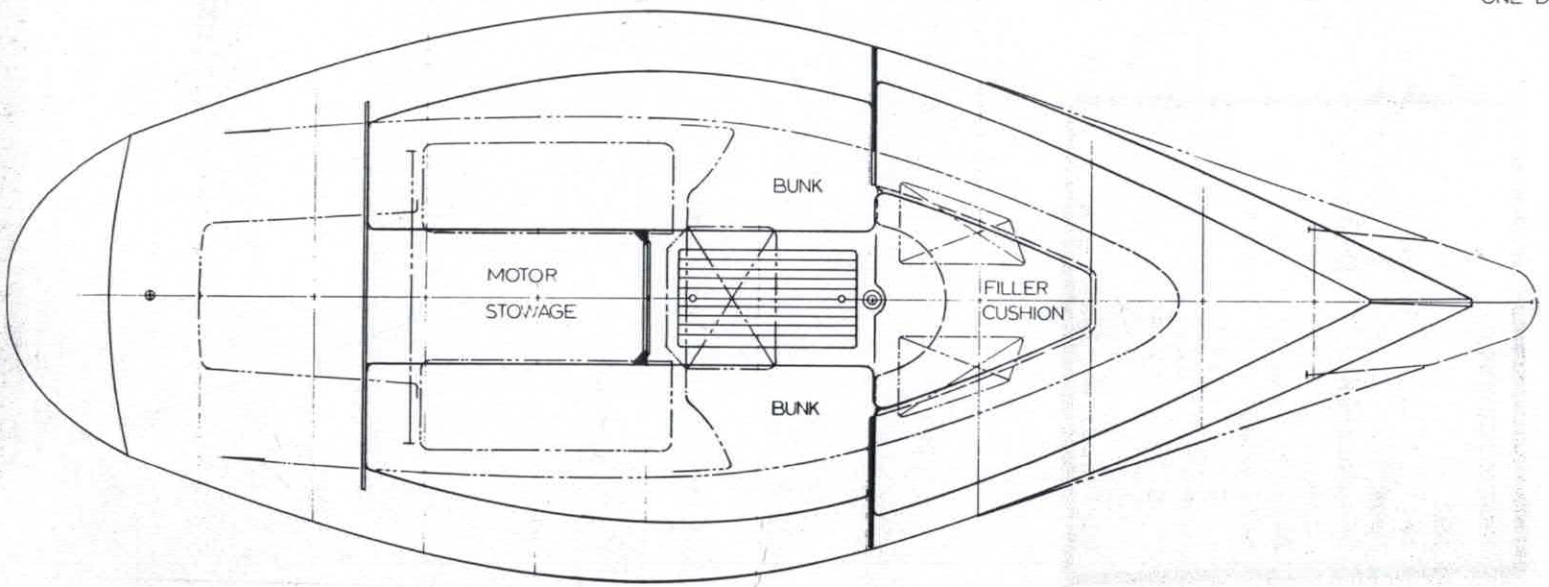
Designer: W. Shad Turner







S-20
ONE DESIGN



SANTANA 20

THIS BOOK IS FOR SANTANA 20 NO. _____

THIS BOAT WAS BUILT ON SALES ORDER NO. _____

THIS SALES ORDER WAS INITIATED ON _____

THE DEALER THIS BOAT WAS SOLD TO WAS _____

_____

This owner's handbook is intended as a guide for Santana 20 owners. There are, of course, a variety of opinions concerning much of what is contained in this guide. Please use your best judgment and seek professional advice when in doubt.

Published by
The W. D. Schock Corporation

July 1, 1985

TABLE OF CONTENTS

ILLUSTRATIONS

W. D. SCHOCK CORPORATION LIMITED WARRANTY

W. D. SCHOCK CORPORATION, herein referred to as SCHOCK, warrants to the original retail purchaser all fabricated materials and parts manufactured by SCHOCK to be free from defects in material and workmanship under normal use and service for a period of six months after purchase by the original retail purchaser or 12 months from date of shipment by the manufacturer, whichever date first occurs.

SCHOCK expressly disclaims any warranty as to any external finish applied to any yacht, including gelcoat and bottom paint. SCHOCK expressly disclaims any warranty relative to engines, tanks and other parts, equipment or trade accessories not specifically manufactured by SCHOCK whether warranted by the manufacturer or not. SCHOCK expressly disclaims any warranty as to the condition, merchantability or fitness of any yacht which is not commissioned, operated or maintained properly, or if the yacht has been rented, leased chartered or used for commercial purpose. SCHOCK further disclaims any warranty or liability by reason of failure due to racing or use beyond the designed limits of the yacht or any of its component parts.

If during the warranty period it is established to SCHOCK's satisfaction that the yacht or any part thereof herein warranted is defective in material or workmanship under normal use and service, then SCHOCK shall have the option of repairing the defective product or part, or replacing the defective product or part by shipment to the original retail purchaser FOB the Schock factory. SCHOCK shall not be responsible for any cost of removal or replacement of the defective product or part. The provisions herein constitute the exclusive warranty rights of the original retail purchaser and the limit of SCHOCK's responsibility.

11/1/84

WARRANTY PROCEDURE

Following is a detailed outline of the W. D. SCHOCK CORPORATION warranty procedure. Please read it carefully.

1. Warranty registration certificates must be completely filled out and on file with SCHOCK within sixty days of purchase by the original retail purchaser.

2. Always refer to the hull number.

continued . . .

3. All claims regarding warranty must be handled through an authorized SCHOCK dealer.

4. Before any warranty work can be initiated, the following information in the form of a warranty claim must be submitted by the dealer in writing to the W. D. SCHOCK CORP.:

   a. Detailed description of claim (accompanied by pictures, if possible).

   b. Boat model number and date purchased; date boat was delivered to the original retail purchaser.

   c. Price quotations from two independent sources forwarded to the W. D. Schock Corp. before work is begun. If work is started prior to approval, it will not be considered under warranty.

   d. Name, address, and phone number of the boat repair shop quoting repair prices.

   e. Method of repair

5. In case of necessity, the dealer may contact SCHOCK directly concerning the problem and the warranty department may authorize a specific monetary amount to be used to settle the warranty claim or otherwise direct the procedures to be followed.

6. W. D. Schock Corp. will not be responsible for inconveniences or losses incurred as a result of defect. W. D. Schock Corp. will take measures to correct only the defects.

The dealer is not an agent of SCHOCK except for the purpose of administering the above warranty and SCHOCK does not authorize the dealer to assume for SCHOCK any liability in connection with such warranty.

The within provisions constitute the entire warranties of SCHOCK, and are in lieu of any warranties, expressed or implied.

11/1/84

SANTANA 20 CLASS ASSOCIATION

Mailing Address:
P. O. Box 1844
Newport Beach, CA 92663

The purpose of the one-design class association is to promote one-design class activities and to maintain the one-design features of the Santana 20. It adds to the enjoyment of all Santana 20 sailors and helps to maintain the high resale value of the boat.

The national class officers oversee all Santana 20 class activities. They administer the class rules and organize the district, regional, and class championship regattas. They also publish an annual year book (which includes the current roster of members and current rules), a quarterly newsletter (the 20/20 NEWS), and a booklet of "Technicalities" (a collection of technical articles from past issues of the newsletter). Local fleet activities are organized by the fleet officers.

We would like to encourage you to join the national organization and your local fleet if one exists. Further information can be received by writing to the above address.

Publications: Year Book (Roster & Rules)
20/20 NEWS
"Technicalities"

CONSTRUCTION

The Santana 20 is carefully constructed to provide maximum strength within its one-design weight perameters. The hull is made of alternating layers of mat and woven roving; and the deck is constructed of alternating layers of mat and woven roving with a balsa core and plywood reinforcement in areas of stress. The layers of glass are saturated with resin, which cures to become the stiffening agent.

In order to make a light, strong boat, the amount of cloth, mat, roving, and especially resin must be very carefully controlled. The best way to maintain this control is to apply the various layers by hand. Using this method, the men can very carefully watch the proportions to keep them constant. Since the cost of labor is so high, the hand lay-up method is definitely more expensive. The SCHOCK CORPORATION considers this to be a very worthwhile expense, though, if it is to provide the best product.

An additional advantage of the SCHOCK CORPORATION's hand lay-up technique results from the sanding which is done on the inside surface of the hull and deck at the end of the laminating process. This sanding is, naturally, a very unpleasant and lengthy process. It is also one that is generally omitted by most companies. This sanding does, however, have an extremely important function. It roughens the surface and removes the wax

which is contained in the resin and flows to the top during the curing process. This roughening and removal of wax provides the proper surface for a really good mechanical lock when the interior is bonded into place.

DESIGN STRENGTH

As with most moderate displacement sailboats, the curves and angles of the Santana 20's hull, deck, and interior have been designed especially for maximum strength. These design factors are of critical importance and have been applied extremely successfully in this boat. The roundness of the hull has inherent strength characteristics as does the shape of the "bubble" deck. And strength was given top priority in the design of the interior. Each piece is structurally sturdy and solid, and all pieces are attached to each other. The entire liner is bonded to the hull, so the interior becomes an actual structural member of the boat. The bulkheads, bunk tops, bunk risers, and cabin sole are also bonded to the hull.

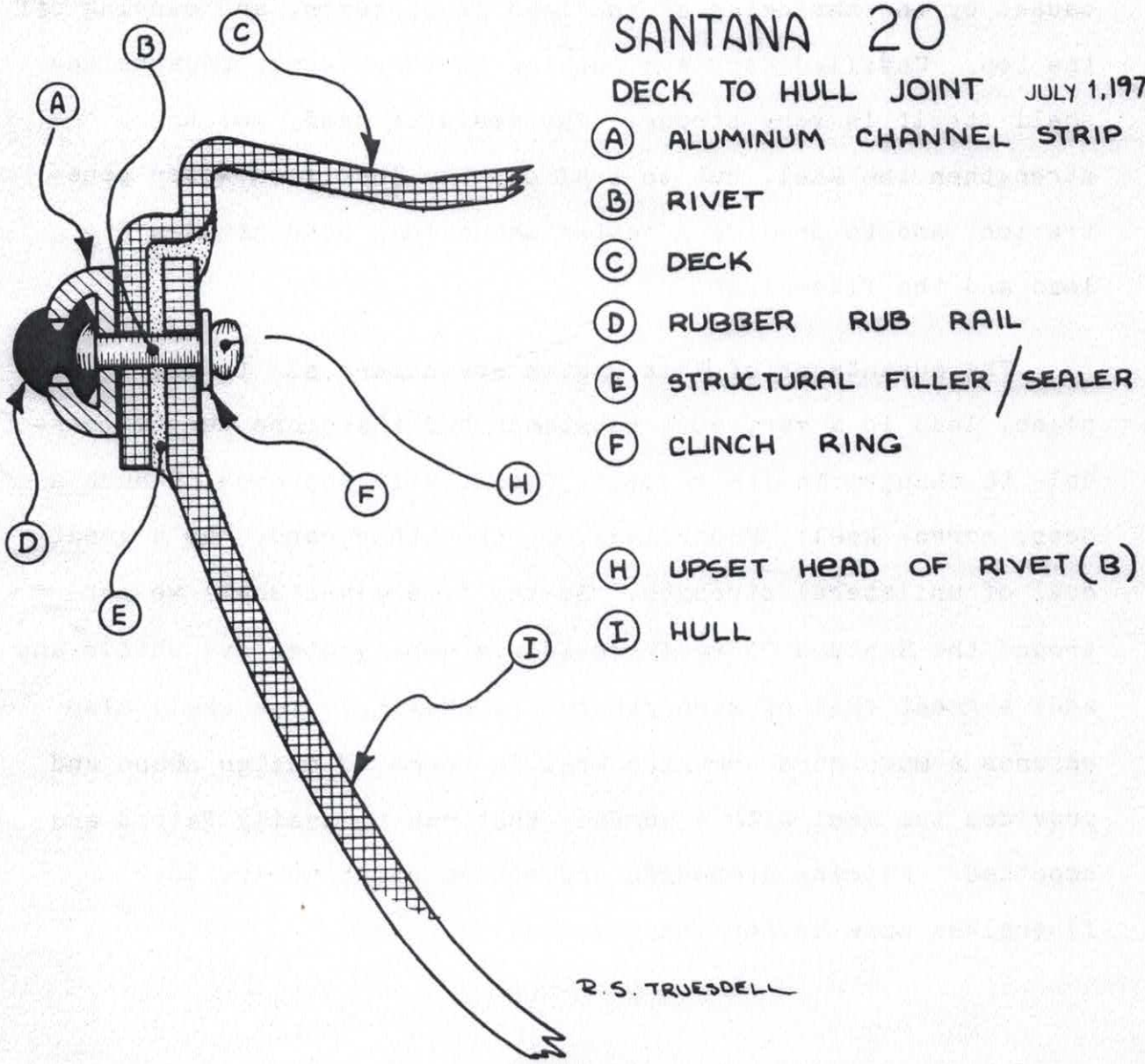
The bilge area, where the keel bolts go through the hull, is reinforced with additional layers of fiberglass and with wood timbers that span from each bunk riser. These timbers are called keel floors: The three in the Santana 20 spread the load of the keel throughout the hull.

DECK

The deck on the Santana 20 is reinforced with end-grain balsawood. The areas which carry the greatest loads are further reinforced with plywood and/or additional layers of fiberglass. This reinforcement is put, for example, under the

stanchions, genoa tracks, cleats, winch pads, etc. The mast is given added support by a 1/4-inch aluminum plate which is placed directly beneath the mast step. A wooden post supports the deck under the mast.

The hull-to-deck bond is another example of the superior strength characteristics of the Santana 20. As shown in the drawing that follows, the deck has a lip which fits down over the hull. Then the deck and the aluminum rail are riveted to the hull.



KEEL

A very unique method is used in the construction of the Santana 20 keel. It is a method that was developed by SCHOCK and has proven extemely successful. Instead of using a pre-casted lead keel, the W. D. SCHOCK CORPORATION first molds a fiberglass shell. Molten lead is then poured into this shell, engulfing the keel bolts which dangle down into the shell. When the lead has hardened, polyurethane resin is pured over the top. The resin seeps down around the lead, filling most of the gaps caused by the shrinking of the lead as it cures, and capping off the top. Unfilled gaps are nothing to worry about because the shell itself is very strong. The resin is used, not to strengthen the keel, but to seal off the lead from water penetration, and to provide a better mechanical bond between the lead and the fiberglass.

The advantages of this system are numerous. In the first place, lead is a very soft substance and therefore very vulnerable to changes in its shape, especially in the case of such a deep, narrow keel. Fiberglass, on the other hand, has a great deal of unilateral strength. So the fiberglass shell we put around the Santana 20 keel provides a good protective shield and adds a great deal of strength to the casting. The shell also ensures a much more accurate keel in terms of design shape and provides the keel with a surface that can be easily faired and smoothed. Fairing compounds and bottom paint adhere to fiberglass much better than to lead.

SANTANA 20 KEELING PROCEDURE

NOTE: The keel weight is 550 pounds with the center of gravity located approximately two-thirds the way up toward the top.

All keel bolt holes in the hull are drilled by jig to proper size and location. Boats delivered with the keel unattached have had the keels pre-fitted at the factory.

THE FOLLOWING IS A STEP-BY-STEP PROCEDURE FOR INSTALLING THE KEEL:

1. Support the keel in a strong holding fixture or framework to keep it upright and level.

2. Lift the boat with a crane and position it above the keel. Then carefully dry fit the hull to the keel by lowering the boat on to the keel while guiding the holes in the hull over the keel bolts.

3. If the fit is correct, raise the boat again and apply resin putty over the entire top surface of the keel. Approximately 2 quarts of putty are required per keel.

   Mix thoroughly 6 cc catalyst (MEK) into 2 quarts resin putty. (Ratio: 3 cc catalyst to 1 qt. putty.) In warm or hot weather, the putty will begin to set up in about 1/2 hour. In cold weather, the time will be longer.

   Be sure to completely fill the recessed area to above the level of the surrounding fiberglass keel shell. This will insure proper bedding of the keel with the excess putty being forced out around the edges.

4. Carefully lower the boat onto the keel.

5. Check inside the boat to be sure putty is forced part way up into the holes and around the keel bolts.

6. Fill the balance of the holes with packing (or caulking yarn) and non-hardening bedding compound (Dolfinite or eq.). The packing can be wrapped around the bolts and then forced down into the hole with a screwdriver. Use ample bedding compound with the packing and bring the final level up slightly above the inside bearing surface of the hull.

7. Install washers and nuts on the keel bolts and tighten, using socket and breaker bar to obtain sufficient force. Tighten keel bolts tightly. Some of the bedding compound and packing may be forced out around the nuts and washers during the process. Be sure the nuts and washers are

bearing firmly and directly against the inside surface of the hull.

8. Check the keel visually for proper alignment with the hull. Further tightening of the keel bolts on one side or the other may be required for final alignment.

9. Remove excess putty from outside surfaces of the hull and keel. Leave small fillet of putty at outside joint, smoothing with finger or end of small rounded stick.

10. Allow approximately 2 hours before applying force on the keel.

MATERIALS REQUIRED:

resin putty
catalyst (MEK)
packing (wicking)
bedding compound
1 - 1/8" deep socket
nuts & washers
socket extension
breaker bar
keel holding fixture
sling or bridle for boat

MAST

Since the first Santana 20 was launched in September of 1976, two major changes have been made in the way the mast is rigged. It is important that you are aware of these changes as you replace old standing rigging and as you update the older boats. Drawings detailing these changes are shown on the following pages.

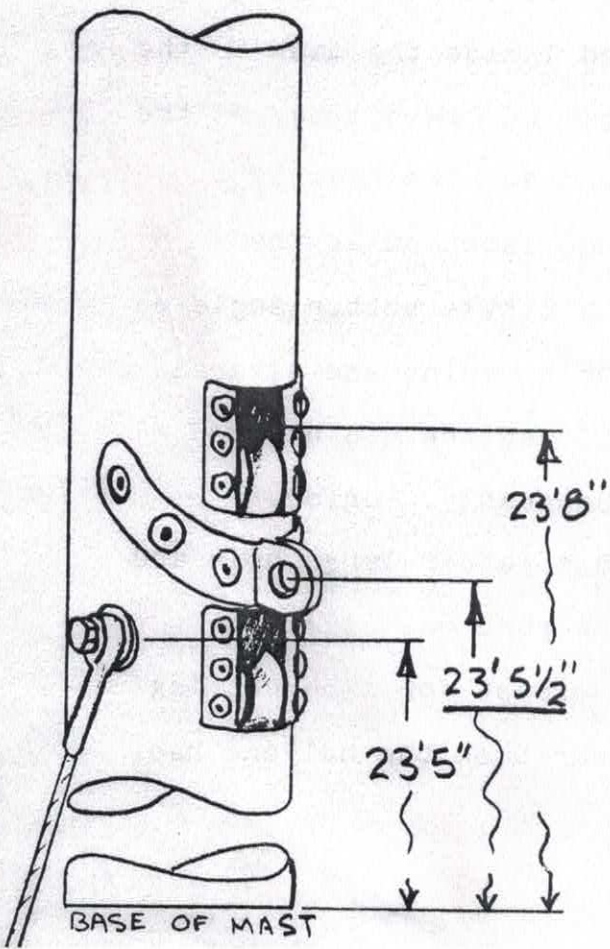
Prior to 1978, the Santana 20 spar had the spinnaker halyard fitting above the jibstay fitting. The jib halyard block was below that and the main upper shrouds were located 23' 5" from the base of the mast. We found this system caused a lot of chafe in the spinnaker halyard, so in 1978 we began rigging the mast as shown in the second drawing.

The shroud location was moved higher to an intersection point up the mast and the jibstay was led inside the mast to the shroud bolt. This provided the same angle on the jibstay as the original system but lengthened the shrouds and the headstay. The jib halyard was also moved to the same location as the spinnaker halyard. This system gave us a little better angle on the shrouds because of the higher attachment point and cleaned up the jibstay intersection. It also allowed the jib halyard and spinnaker halyard to be used interchangeably. Unfortunately, the double sheave box required a rather large hole and the swiveling ability of the spinnaker halyard was still impaired. On one tack it would be fine except for some chafing on the side of the sheave but on the other tack the halyard had to cross over the jibstay.

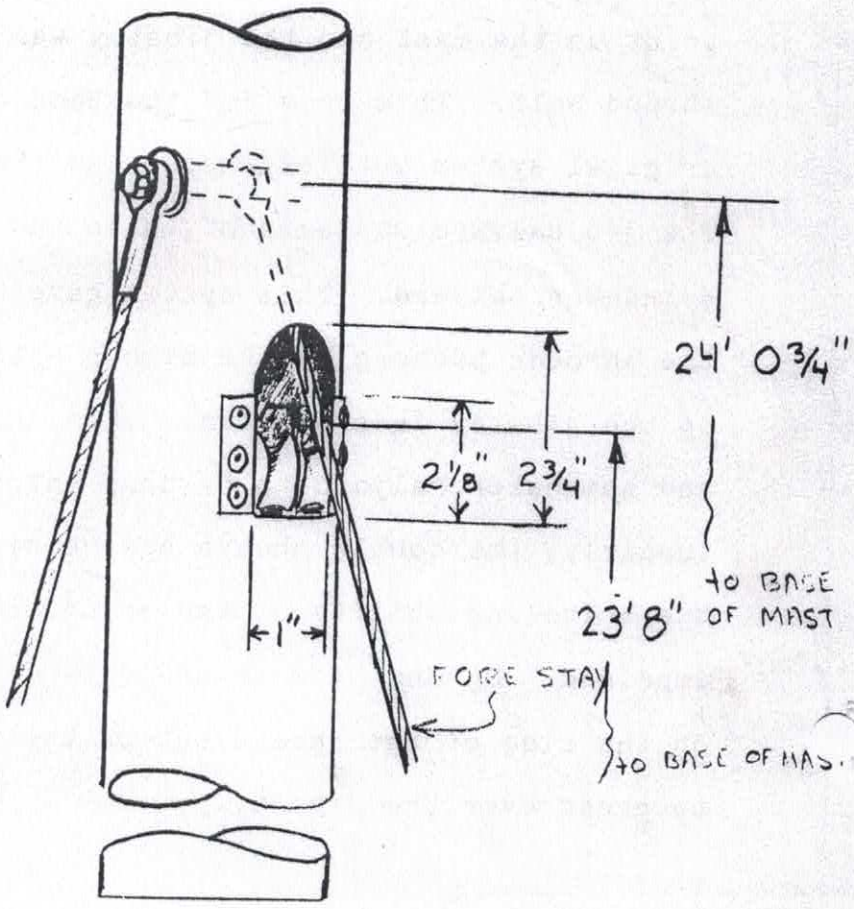
The present rig has the same jibstay and shroud location as in style #2 but relocates the spinnaker halyard exit block almost two feet higher. From this exit point, the spinnaker halyard is led to a swivel block on a tang out beyond the jibstay where in can swivel freely. At the time this change was made, we also converted the jib halyard to wire with a rope tail to minimize stretch. It also allowed the use of a smaller sheave box and thus a smaller opening in the mast. This system is by far the best because there is very little chafe and the spinnaker is unimpaired.

As you order new rigging for your Santana 20, please be sure to indicate which type of rig you have.

Boats built
prior to 1978



Boats built
between 1978 & 1981



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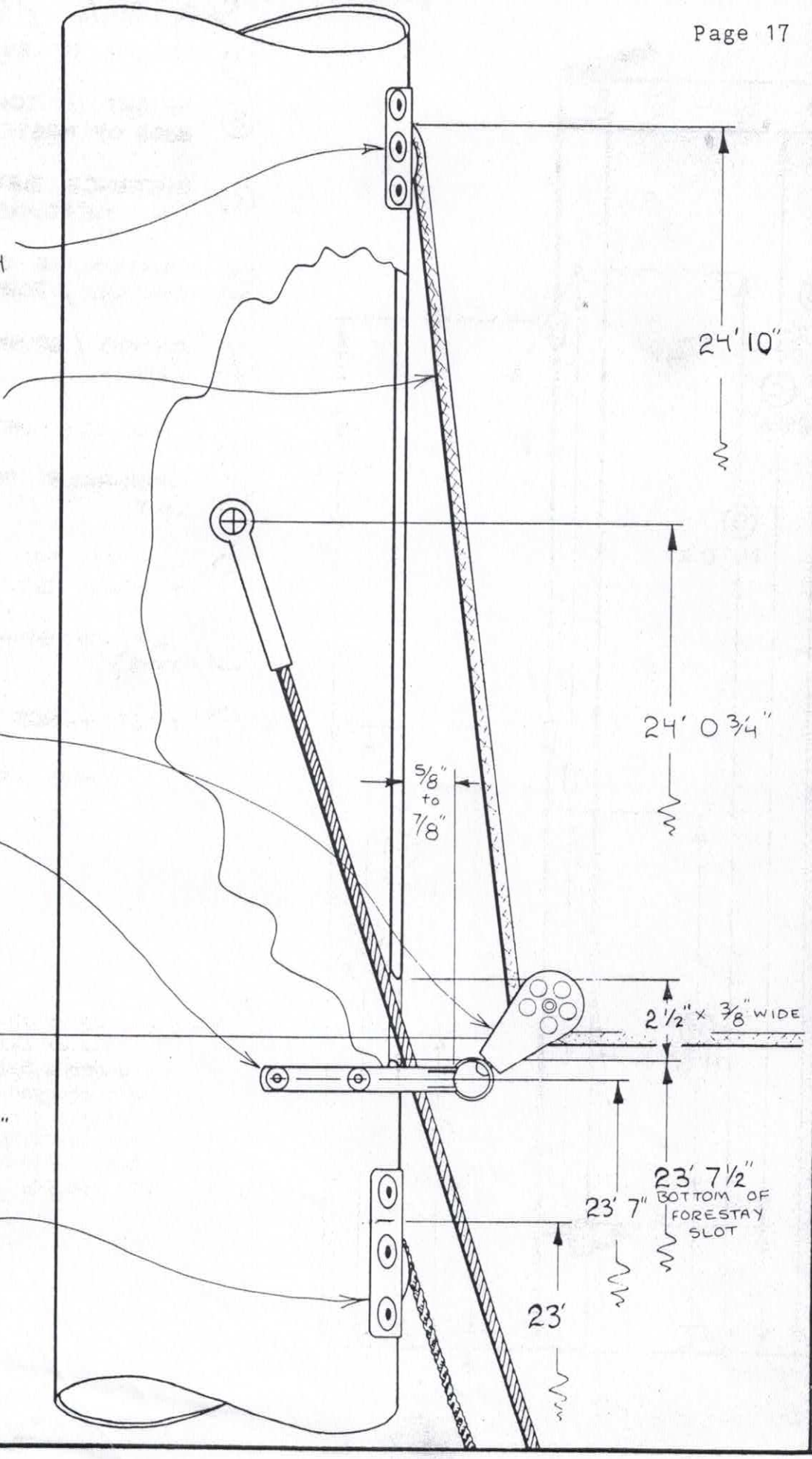


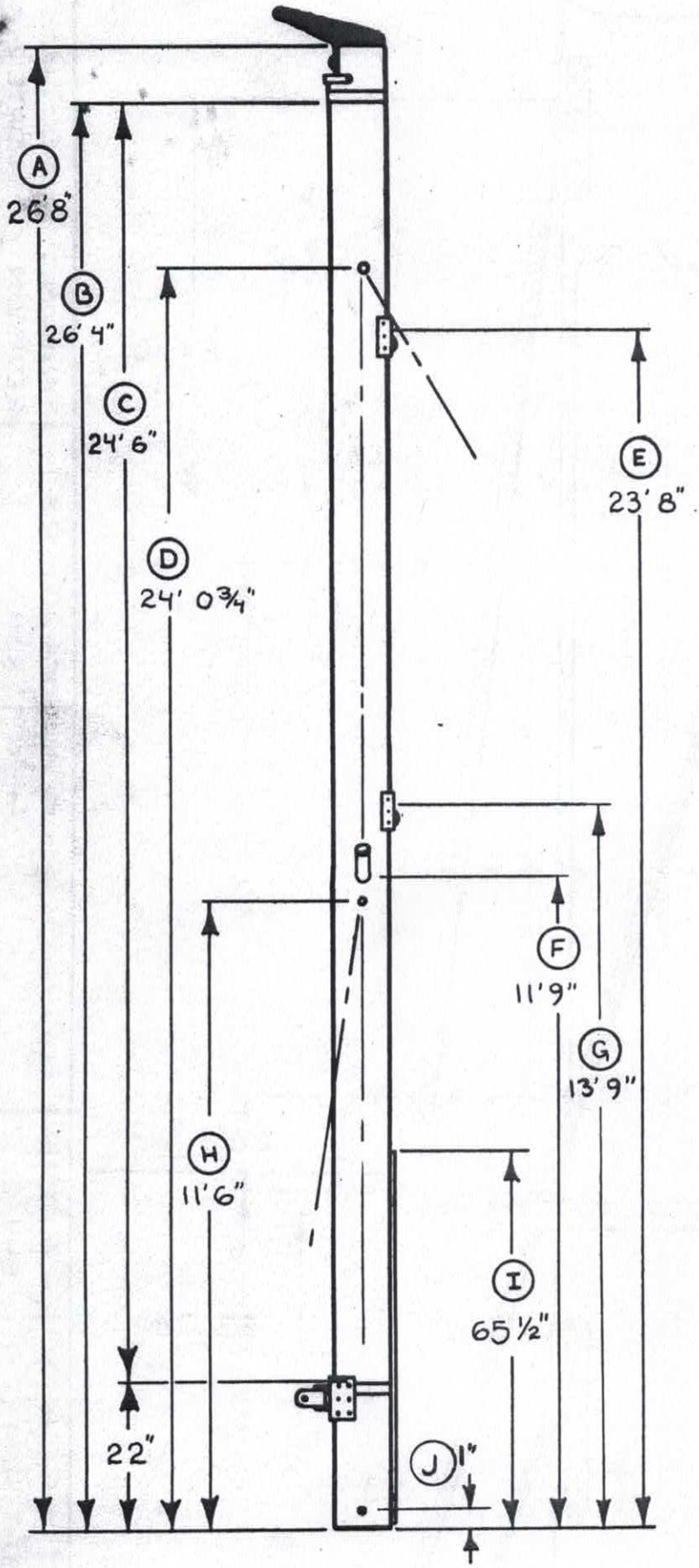
W.D. SCHOCK CORP.
SANTA ANA, CA. 549-2277

SANTANA 20

drawn : R.S.T.
O.K.'ed :

DRAWING # S-20-002
REVISION C DATE 2/JUL/81

SANTANA 20 MAST



(A) LENGTH OF EXTRUSION

(B) HEIGHT OF TOP BAND FROM BASE OF MAST

(C) DISTANCE BETWEEN BANDS ("P" MEASUREMENT)

(D) CENTERLINE OF UPPER SHROUD / FORESTAY BOLT

(E) GENOA / SPINNAKER HALYARD EXIT

(F) SPREADER HEIGHT

(G) SPINNAKER POLE TOPPING LIFT

(H) CENTERLINE OF LOWER SHROUD BOLT

(I) TOP OF SPINNAKER POLE TRACK.

(J) MAST HINGE HOLE

SPREADER LENGTH 24"

NOTE: The upper shroud lengths, spinnaker halyard length, and genoa halyard length have changed through the years as noted on the previous drawings. Check these lengths before replacing old rigging.

R.S.T. JULY 2, 1978

STANDING RIGGING LENGTHS

* UPPER	1/8 CABLE	25"	2 1/2 "	EYE - EYE
LOWER	1/8 CABLE	12'	7 3/4"	"
AFT LOWER	1/8 CABLE	12'	8 3/4"	"
* HEADSTAY	1/8 CABLE	26'	6 1/2"	"
BACKSTAY W/O ADJUSTER	1/8 CABLE	29'	6 3/4"	"

* The original Santana 20 mast used a slightly different method of attaching the uppers and headstay. The headstay measured 29' 6 3/4" eye-to-eye and the uppers 24' 6 1/4".

25'11 5/8"

RUNNING RIGGING LENGTHS

MAIN HALYARD	60'	X	5/16"
GENOA HALYARD	65'	X	5/16"
SPINNAKER HALYARD	65'	X	5/16"
TOPPING LIFT	40'	X	1/4"
FOREGUY	15'	X	1/4"
6:1 VANG	22'	X	1/4"
6:1 BACKSTAY ADJUSTER	22'	X	1/4"
MAINSHEET	40'	X	3/8"
SPINNAKER SHEET	✓ 40'	X	5/16"
2:1 CUNNINGHAM REEF	15'	X	5/16"
GENOA SHEET	45'	X	5/16"
TRAVELER CONTROL LINES	8'	X	5/16"
BOOM REEF LINE	20'	X	1/4"
OUTHAUL LINE	9'	X	1/4"
OUTHAUL CABLE	4'	X	3/32"

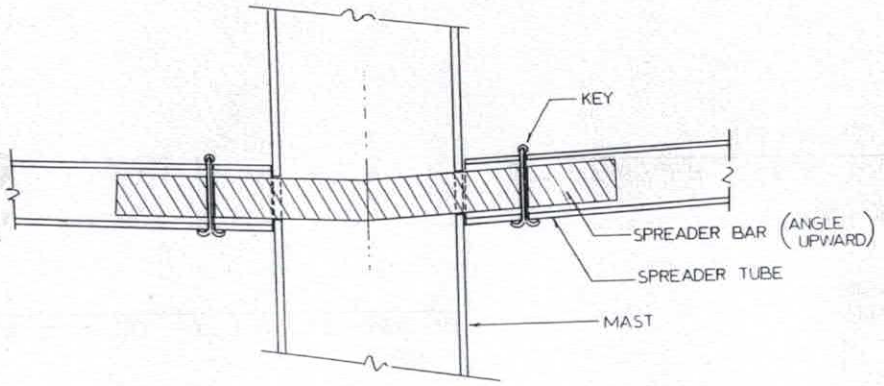
NOTE: These are the measurements used by our rigging loft. Lengths for your boat may vary considerably.

SANTANA 20 SPREADER BAR INSTALLATION PROCEDURE

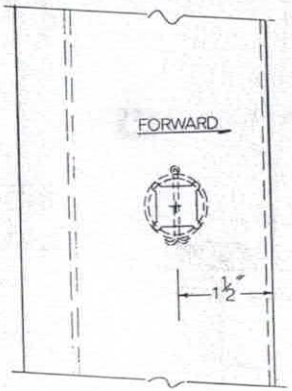
1. Remove old spreader socket.
2. Locate center point on both sides of mast to drill 5/8" hole.
3. Make pencil lay-out of 5/8" square hole on side of mast.
4. Drill 1/8" hole at each corner of 5/8" square lay-out on mast, do each side.
5. Drill 5/8" hole both sides.
6. File 5/8" hole to a square hole as shown on drawing, do not make square corners.
7. Insert spreader bar so the bend in it is at the center line of the mast.
8. Slide the spreader bar and drill through the hole in spreader to make cotter pin hole in spreader bar.
9. Insert cotter pin.

NOTE: Be sure to line up the upper shroud to the center of the mast before you drill the hole for the cotter pin.

- DRAWINGS FOLLOW -



SECTION – FORWARD VIEW



SIDE VIEW
SHOWING FINISHED HOLE
AND GHOST OF SPREADER

DRILLING SCHEME

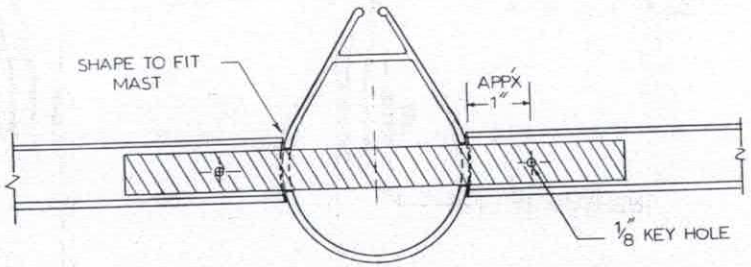
— DRILL 1/8" PILOT HOLE

— DRILL 5/8" HOLE

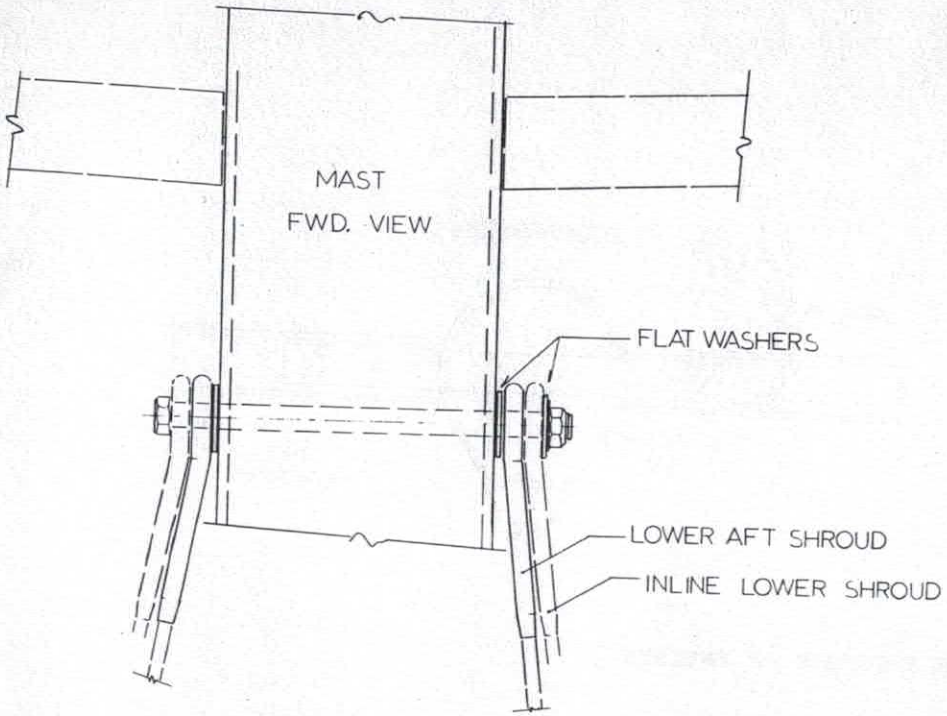
— FILE TO 5/8" SQUARE

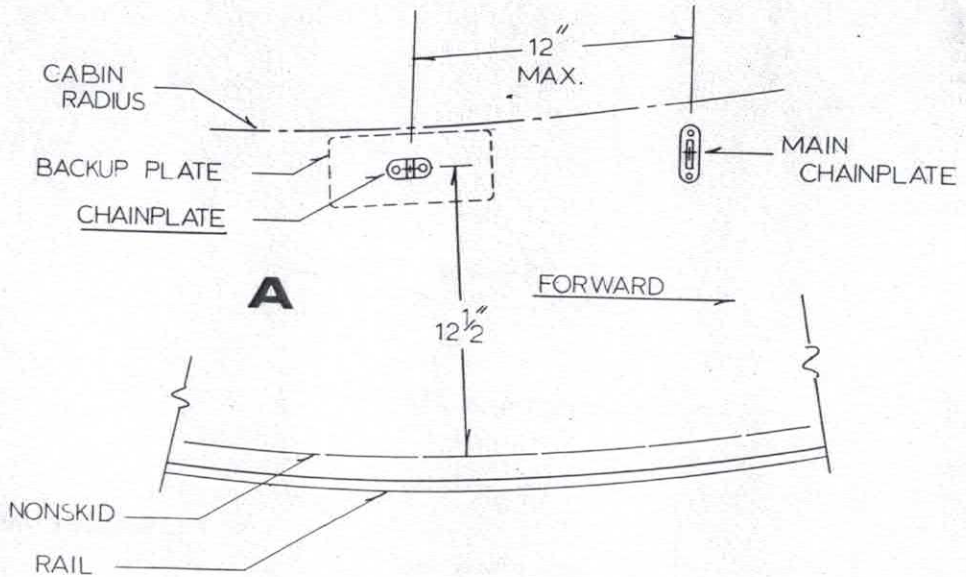
— RELIEVE CORNERS WITH 1/8" DRILL OR RATTAIL FILE

SANTANA 20 SPREADER BAR ASSEMBLY



SECTION – TOP VIEW

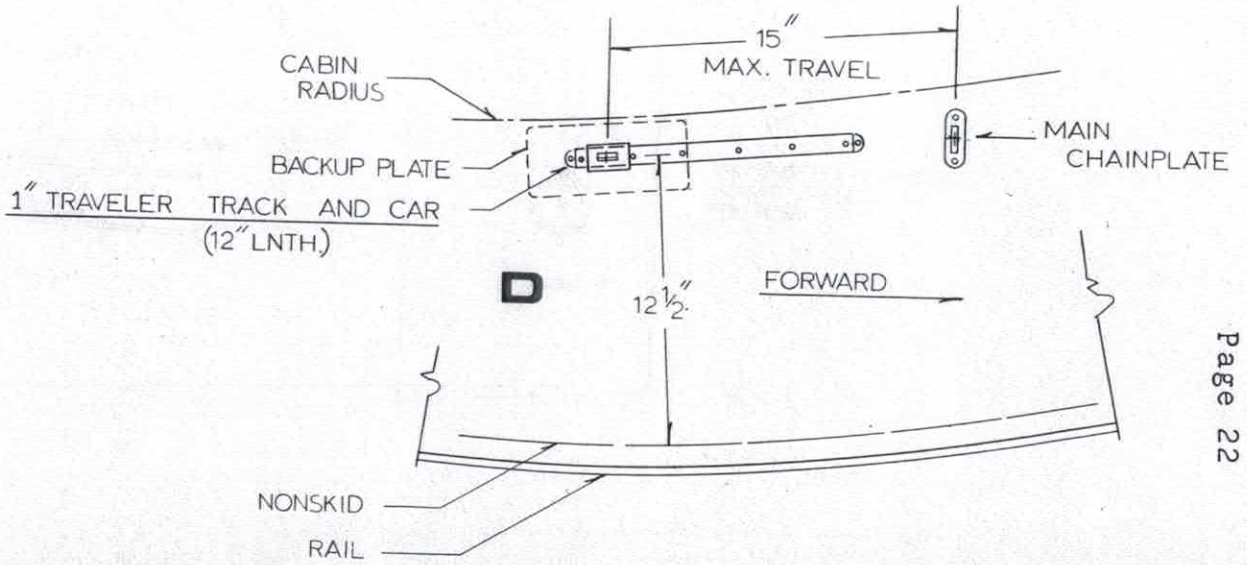




SANTANA 20 — AFT LOWER SHROUD

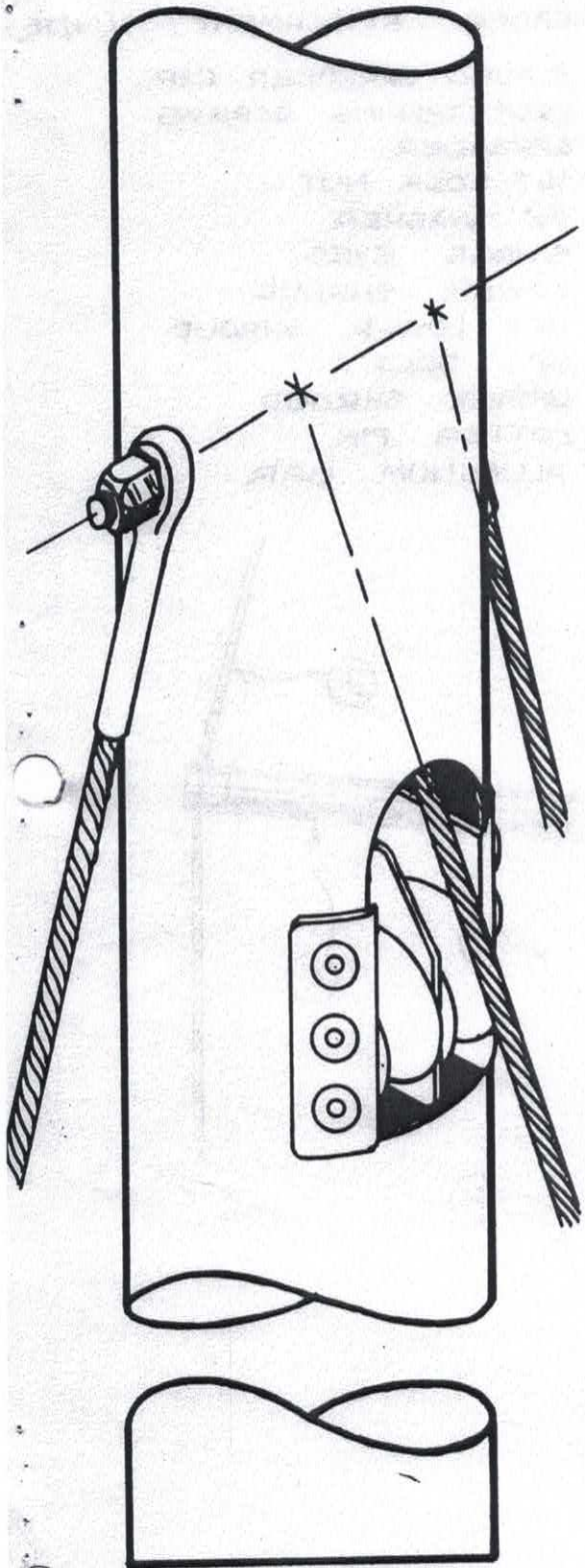
A — FIXED

D — RUNNING

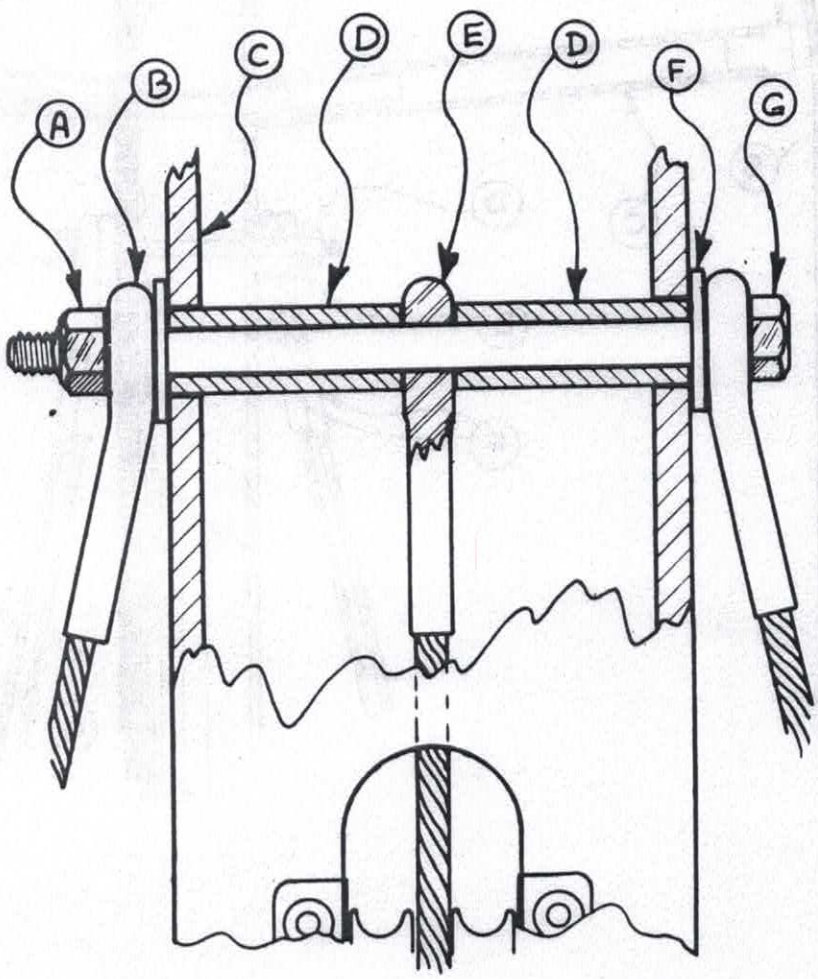


FORESTAY & UPPER SHROUD ATTACHMENT

MAR. 4, 1978



(A) LOCKNUT
(B) SWAGE EYE ON UPPER SHROUD
(C) MAST WALL
(D) COMPRESSION TUBE (2 PCS.)
(E) SWAGE EYE ON FORE-STAY
(F) FLAT-WASHER (2 PCS.)
(G) 1/4" x 4" BOLT

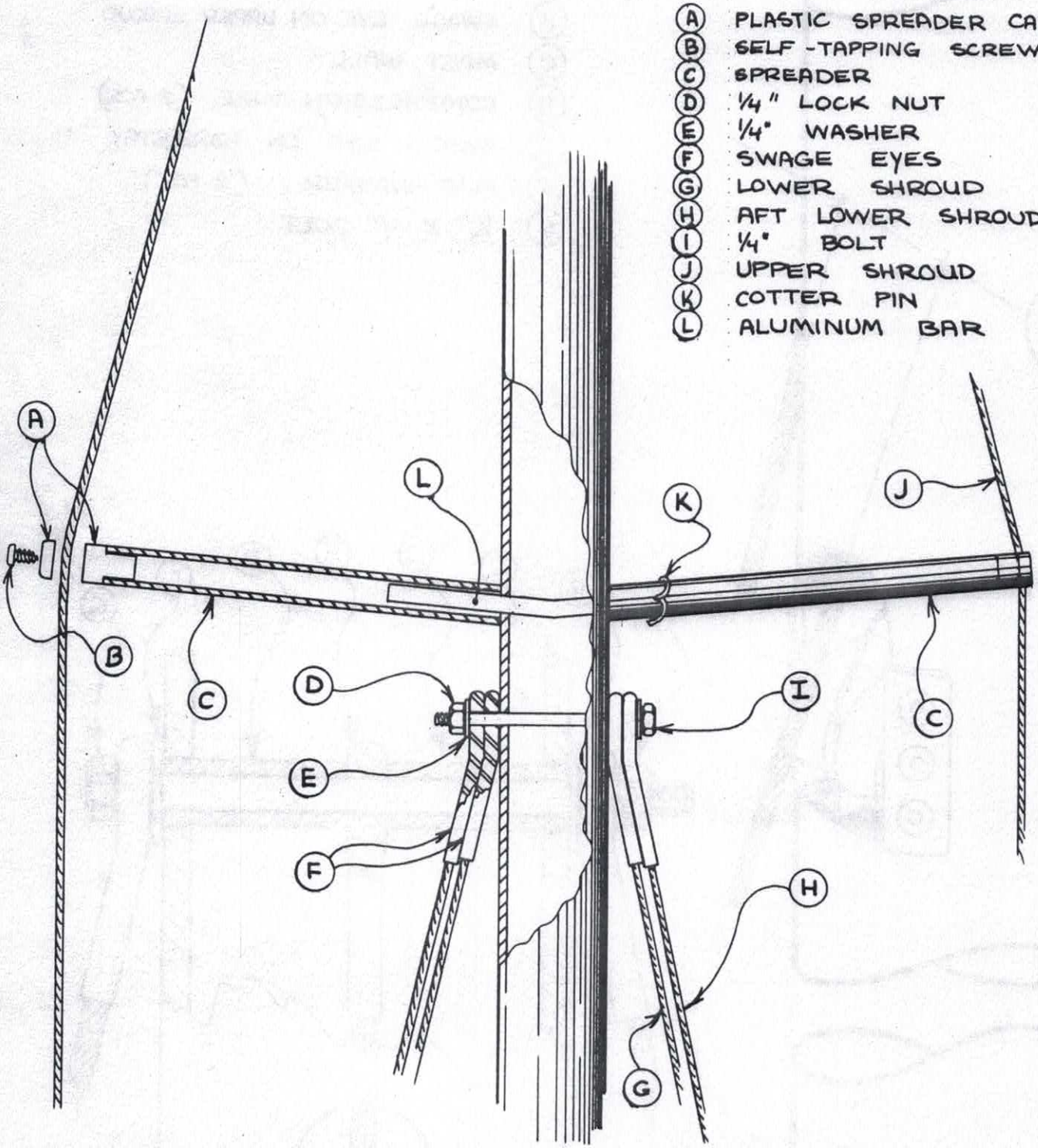


R. S. TRUESDELL

SANTANA 20

SPREADER ATTACHMENT 9/14/78

- (A) PLASTIC SPREADER CAP
- (B) SELF-TAPPING SCREWS
- (C) SPREADER
- (D) 1/4" LOCK NUT
- (E) 1/4" WASHER
- (F) SWAGE EYES
- (G) LOWER SHROUD
- (H) AFT LOWER SHROUD
- (I) 1/4" BOLT
- (J) UPPER SHROUD
- (K) COTTER PIN
- (L) ALUMINUM BAR



SANTANA 20 BOOM

(A) CLEAT FOR REEFING LINE

(B) BOOM VANG BAIL

(C) CHEEK BLOCK FOR REEFING LINE ~ POSITIONED AGAINST AFT EDGE OF MAIN SHEET BAIL

(D) CLEW OUTHAUL EXIT BLOCK

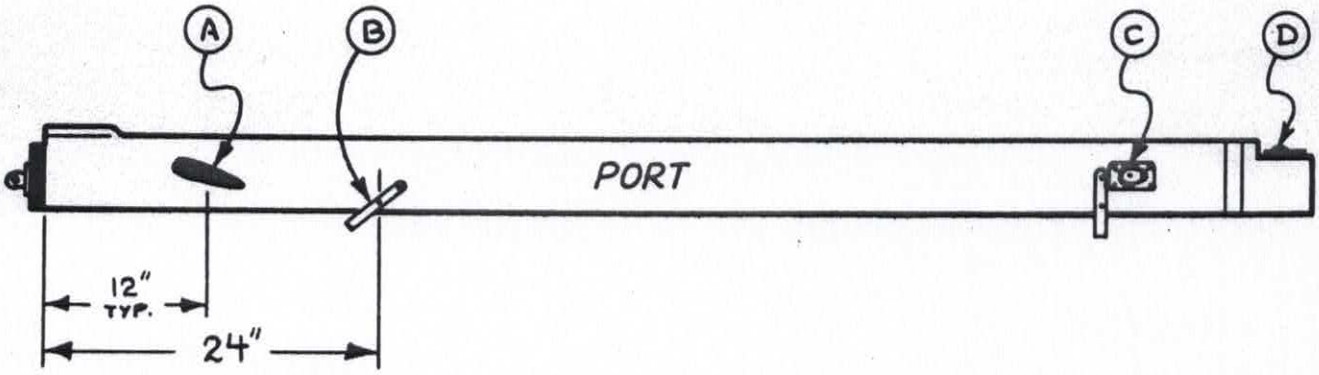
(E) SAIL MEASUREMENT BAND

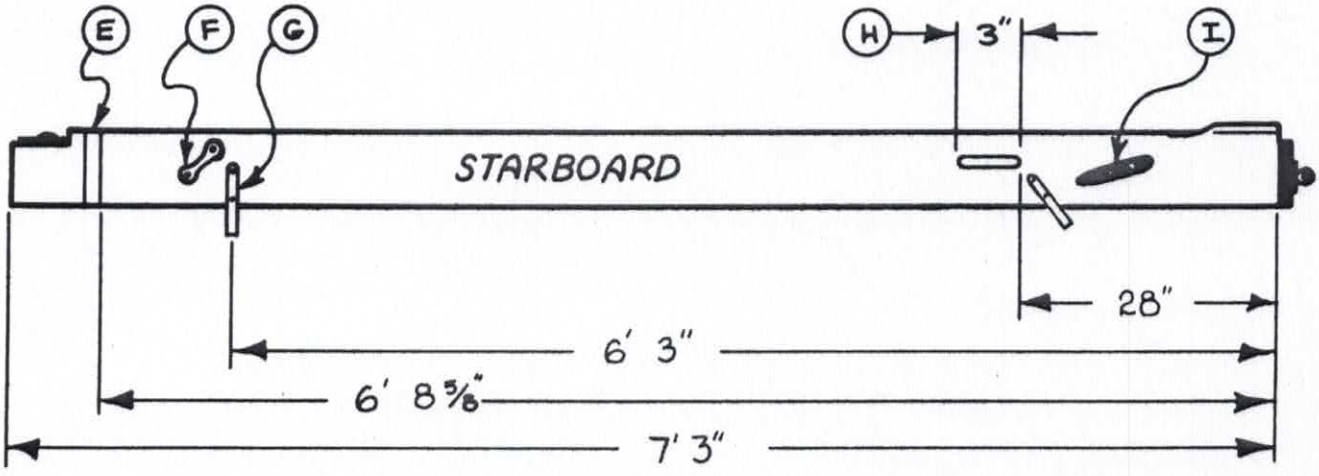
(F) PAD EYE FOR REEFING LINE DEAD END

(G) MAINSHEET BAIL

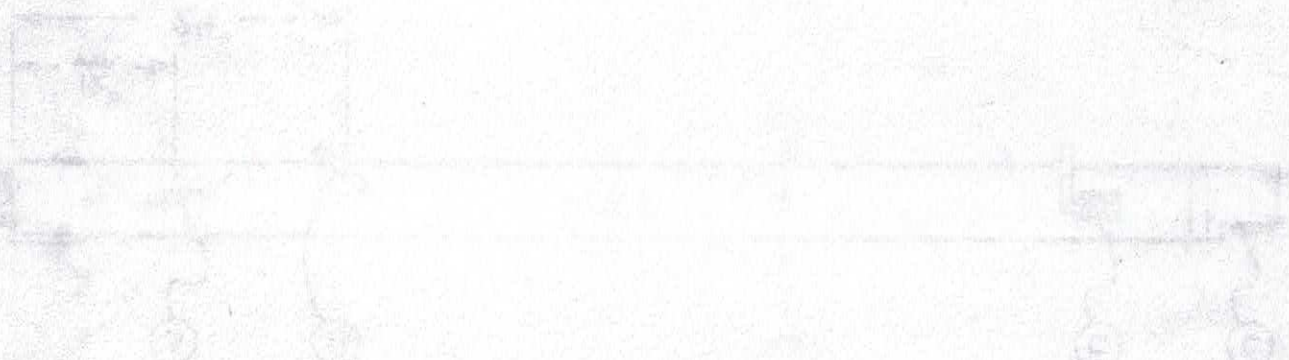
(H) OUTHAUL EXIT SLOT

(I) CLEAT FOR OUTHAUL





R.S.T. JULY 1, 1978



RAISING AND TUNING THE MAST

DANGER: THIS MAST CONDUCTS ELECTRICITY - WATCH FOR WIRES
Do not raise or lower the mast or tow the boat with the mast up in the vicinity of power lines.

Proper tuning of any sailboat mast is of critical importance because it prevents unnecessary wear and tear on the equipment, and because it allows the boat to achieve its optimum performance capabilities.

A. RAISING THE MAST

Of critical importance in raising the mast is making sure that none of the shrouds are caught under a cleat, and that turnbuckles are not in a position which would bend their threaded studs.

1. Attach all of the standing rigging to the mast, making sure that all of the cotter pins are in place, the nut are peened so they cannot back off the bolt, and the halyards are clear.
2. Attach the backstay and the upper and lower shrouds to the chainplates. Before the mast is raised, make sure all the turnbuckles have the same number of threads on each side of the barrel. The turnbuckles should be 4/5 to full open.
3. Block up the back of the trailer so the boat cannot tip backwards.
4. Move the mast aft and place the butt of the mast in the mast hinge. The raising process takes three people. One person can be pulling either a halyard or the forestay. A second person should be as far aft as possible with the mast supported on his shoulder. And the third person should be just aft of the companion-way in a position to press the mast upward. As the mast is working up, the person who is all the way aft should be walking forward with the mast over his head.

B. TUNING THE MAST

1. When the mast is standing, all of the rigging will be loose. Tighten the forestay and backstay first. The mast should stand straight fore and aft.
2. Tighten the upper shrouds. You can tell if the mast is off to port or starboard by using the main halyard. Take the main halyard shackle to a reference point on the turnbuckles. Cleat the halyard and take it to the other side. If it is at the same point on the other turnbuckle, the mast is straight athwartship in the boat.

3. Tighten the center lower shrouds. Sight the sail track by eye to see that the mast does not bend to port or starboard. Use the main halyard to keep the mast in the center of the boat.
4. The aft lower shrouds are left slack. They are to prevent the mast from pumping. They will determine how much mast bend you will have. The tighter they are, the less mast bend you will have.

C. SETTING THE TENSION ON THE STANDING RIGGING

1. The upper shrouds should be tight. The center lower shrouds and the aft lower shrouds should be quite loose. The foestay should be quite tight, and it should get super tight when the backstay is loaded. The backstay tension will also bend the mast. This is a bendy rig, and a bendy rig is great for mainsail control. The mast should stand with very little or no rake.
2. The final sighting of the mast to see that it is straight should be done while you are sailing. You should look up the sail slot to see if the mast is bending off in any direction. It may require adjusting one of the upper or lower shrouds because the wire will stretch under load. Again, be sure all of the lock nuts and cotter pins are locked and secure. Don't forget to tape all cotter pins and sharp corners so lines and sails won't chafe on them.

NOTE: It is impossible for the W. D. Schock Corporation to fully guarantee the mast of the Santana 20. The original tuning and rigging of the mast are extremely important because of the light weight, bendy section used and because of the individual stretch characteristics of the wire. Therefore, it is best to have a knowledgable person oversee this rigging and tuning in order to eliminate the possibility of overloading the shrouds.

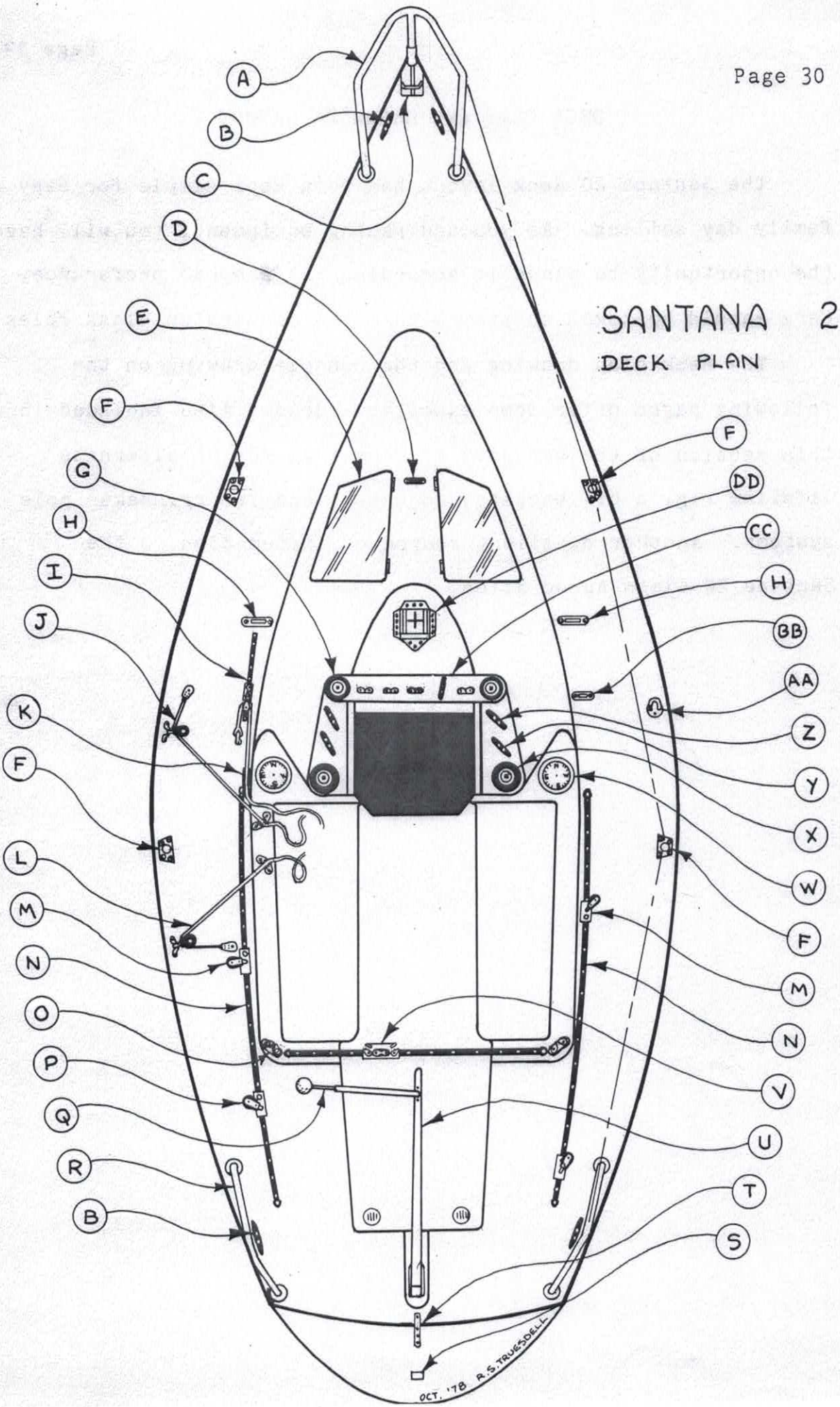
DECK PLAN AND HARDWARE LAYOUT

The Santana 20 deck layout has been kept simple for easy family day sailing. As you add racing equipment, you will have the opportunity to place it according to personal preference. Care should be taken to stay within the one-design class rules.

The deck plan drawing and the console drawing on the following pages offer some excellent ideas. Also included in this section of the handbook are drawings for an alternate lifeline rig, a 6:1 backstay adjuster, and two spinnaker pole systems. Another excellent source of information is the Santana 20 Class Association.

SANTANA 20

DECK PLAN



SANTANA 20 DECK PLAN

(A) BOW PULPIT

(B) MOORING CLEAT

(C) FORESTAY/JIB TACK/BOW PULPIT FITTING

(D) SPINNAKER FOREGUY FAIRLEAD

(E) FOREWORD HATCHES

(F) LIFELINE STANTION

(G) HEADSAIL HALYARD WINCH

(H) CHAINPLATE FOR UPPER AND LOWER INLINE SHROUDS

(I) RUNNING AFT LOWER SHROUD ASSEMBLY (SEE "AFT LOWER SHROUD" DRAWING)

(J) SPINNAKER TWEEKER

(K) CLAM CLEAT FOR RUNNING AFT LOWER SHROUD

(L) BARBER HAULER FOR 150% GENOA

(M) GENOA SHEET FAIRLEAD

(N) GENOA TRACK - 1" "T" TRACK

(O) CAM CLEAT FOR SPINNAKER SHEET

(P) SPINNAKER SHEET FAIRLEAD

(Q) TELESCOPING TILLER EXTENSION

(R) STERN RAIL

(S) SOCKET FOR OUTBOARD MOTOR BRACKET

(T) BACKSTAY TANG (SEE "BACKSTAY ADJUSTER" DRAWING)

(U) TILLER

(V) MAINSHEET TRAVELER

(W) COMPASS

(X) GENOA SHEET WINCH

(Y) GENOA SHEET CLEAT

(Z) HEADSAIL HALYARD CLEAT

(AA) SPINNAKER GUY REACHING HOOK (OPTION TO (J) "TWEEKER")

(BB) CHAINPLATE FOR FIXED AFT LOWER SHROUD (OPTION TO (I) "RUNNING AFT LOWER SHROUD." SEE "AFT LOWER SHROUD" DRAWING)

(CC) SAIL CONTROL CONSOLE (SEE "SAIL CONTROL CONSOLE" DRAWING)

(DD) MAST HINGE AND HALYARD WING PLATE (SEE "SAIL CONTROL CONSOLE" DRAWING)

SANTANA 20

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Santa Ana, California 92704
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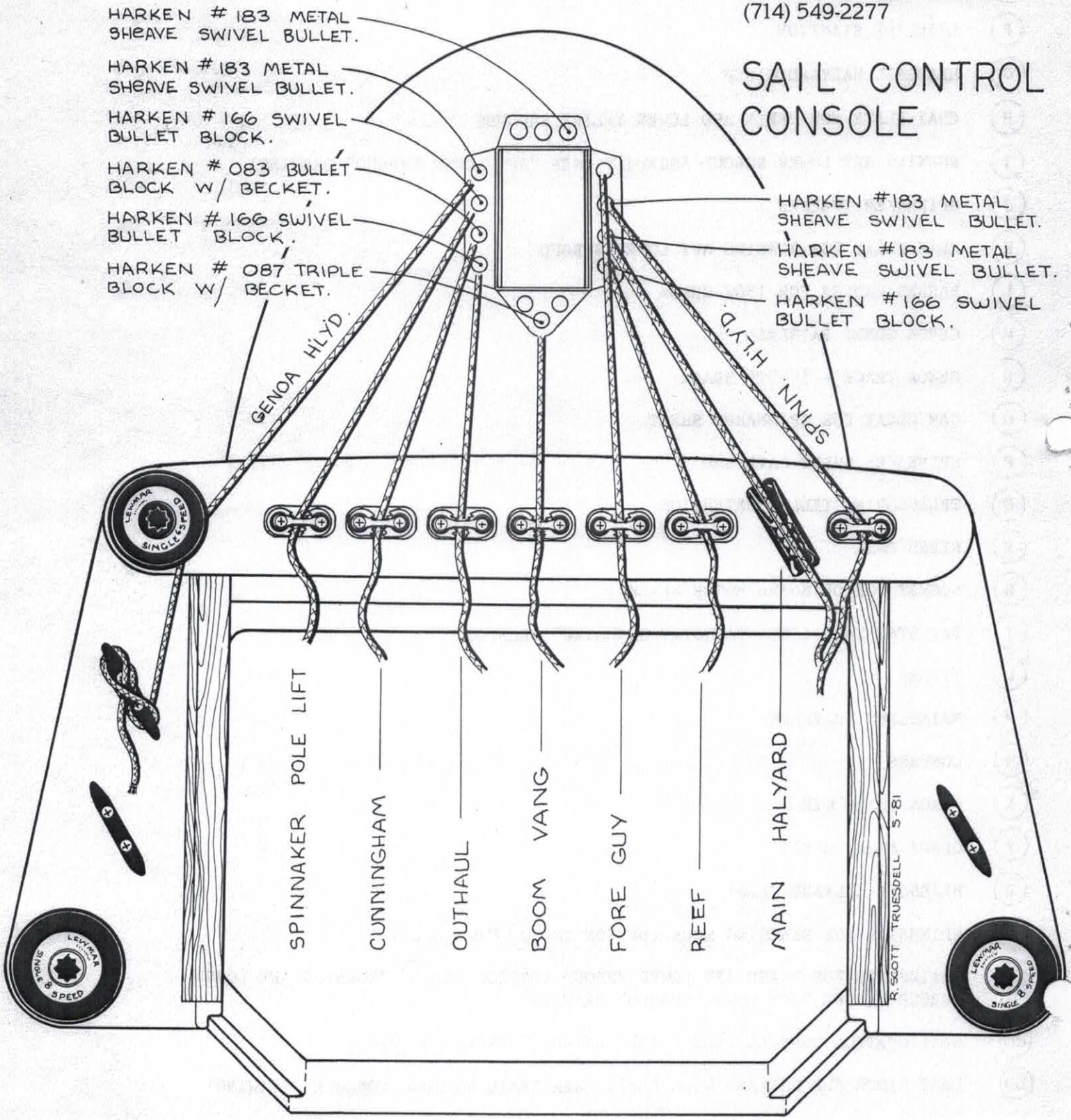
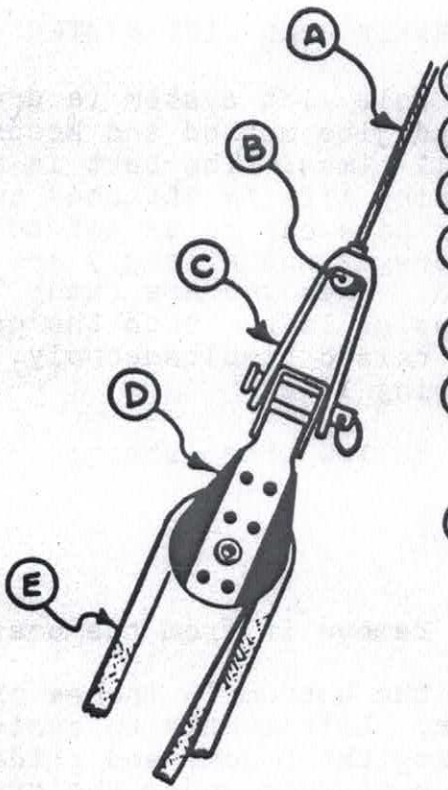
SAIL CONTROL CONSOLE



6 : 1 BACKSTAY ADJUSTER



(A) BACKSTAY ~ CUT TO 32' 4"

(B) 1/8" SWAGE BALL

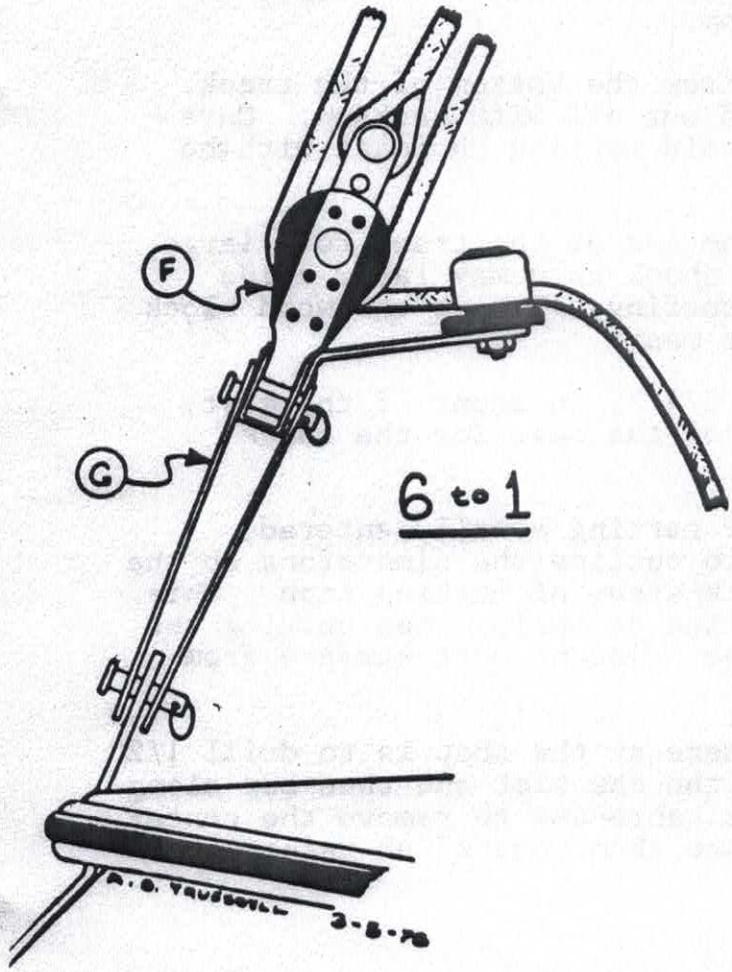
(C) TOGGLE

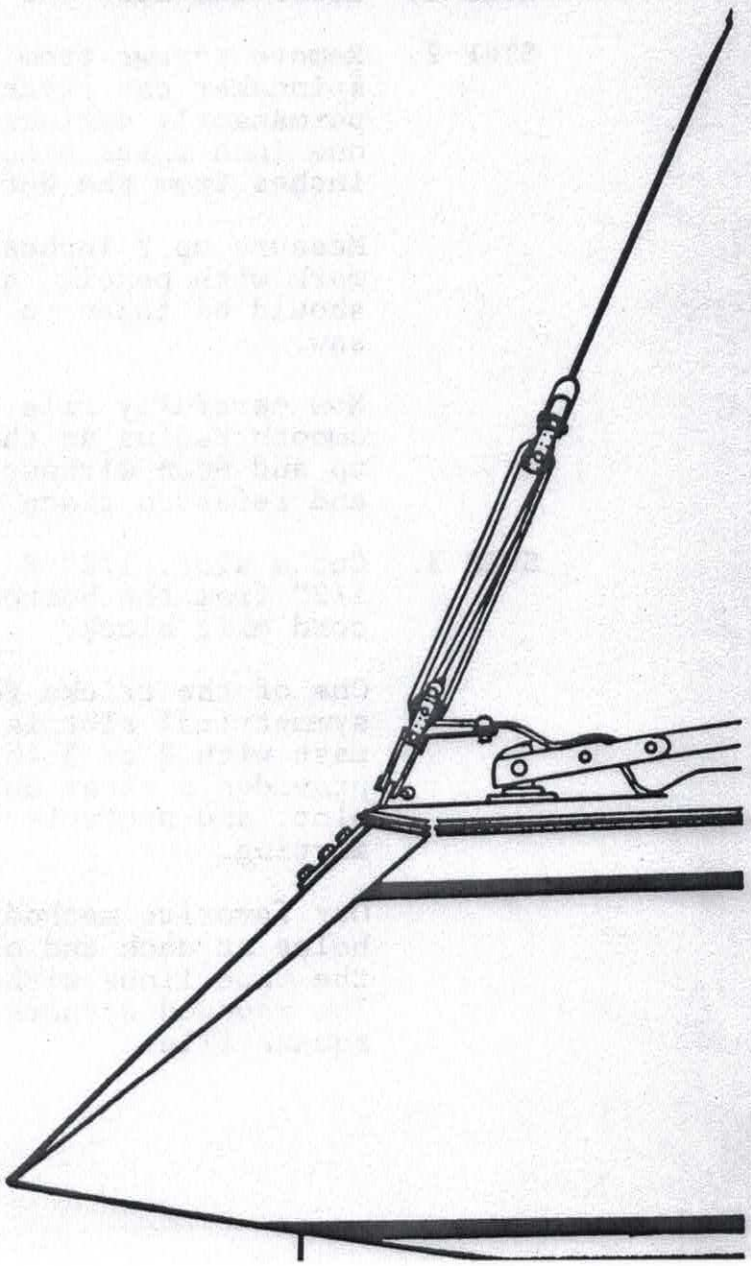
(D) HARKEN TRIPLE BLOCK PART # 86

(E) SAMPSON BRAID ~ 1/4" X 22'

(F) HARKEN TRIPLE BLOCK WITH BECKET AND CAM CLEAT ~ PART # 95

(G) 4" STAINLESS STRAPS ~ SCHAEFFER PART # 85-24 (2 REQUIRED)





AUTOMATIC SPINNAKER POLE LIFT SYSTEM

The automatic spinnaker pole lift system (a drawing follows) utilizes the end-for-end jibe method and keeps the pole in the "ready" position at all times. The butt is attached to the car on the mast; the topping lift is attached to the pole and tied off to the spinnaker pole car so as not to hinder tacking maneuvers; and the foreguy and afterguy are also attached and ready to be used. When you are ready to set the spinnaker, just raise the topping lift. Both the outboard and inboard ends of the pole are raised simultaneously. To lower the pole, just lower the topping lift.

To install this system, follow these steps:

STEP 1. Lower the mast and remove it from the boat.

STEP 2. Remove screws from the bottom 18 inches of the spinnaker car track. Lift gently to avoid permanently springing the track, and slide a one inch thick piece of wood under the track, six inches from the bottom.

Measure up 2 inches from the bottom of the track, mark with pencil, and cut off with hacksaw. Care should be taken to avoid marring the mast with the saw.

Now carefully file the end of the track to a large, smooth radius so the shock cord may later slide up and down without chafing. Remove the wood block and refasten trace to mast.

STEP 3. Cut a slot, 1/2" X 1 3/4 ", in front of the mast, 1/2" from the bottom of the mast for the shock cord exit block.

One of the tricks for getting a well-centered, symmetrical slot is to outline the dimensions on the mast with 2 or 3 thicknesses of masking tape. This provides a clear outline to follow when cutting the slot, and protects the adjacent mast surface from marring.

Our favorite method here at the shop is to drill 1/2" holes at each end of the new slot and then cut along the tape lines with a sabre-saw to remove the center. The rounded corners are then squared up using a square file.

STEP 4. The exit block mounting flanges should be bent down slightly to conform with the curved face of the mast. Now use the holes in the flanges as guides to drill the six holes for the fasteners. The drill should be 9/64" if you are using the stainless steel self-tapping screws, or 3/16" if you are using the monel pop rivets. The exit block may be installed at this time.

STEP 5. Measure 8' 6" from bottom of mast and drill 3/4" hole for shock cord dead end. Insert the plastic bulls-eye and drill for fasteners, 9/64" for screws or 3/16" for rivets. DO NOT FASTEN BULLS-EYE TO MAST AT THIS TIME.

Carefully feed shock cord through the newly made 3/4" hole towards the bottom of the mast. It helps if the mast is tilted during this installation so that gravity can be an asset instead of a nuisance.

When the shock cord comes out of the bottom of the mast you must inspect inside from the bottom to make sure there are no twists around any of the halyards. It may be necessary to remove and re-insert the shock cord several times before it is free of the other running rigging inside the mast.

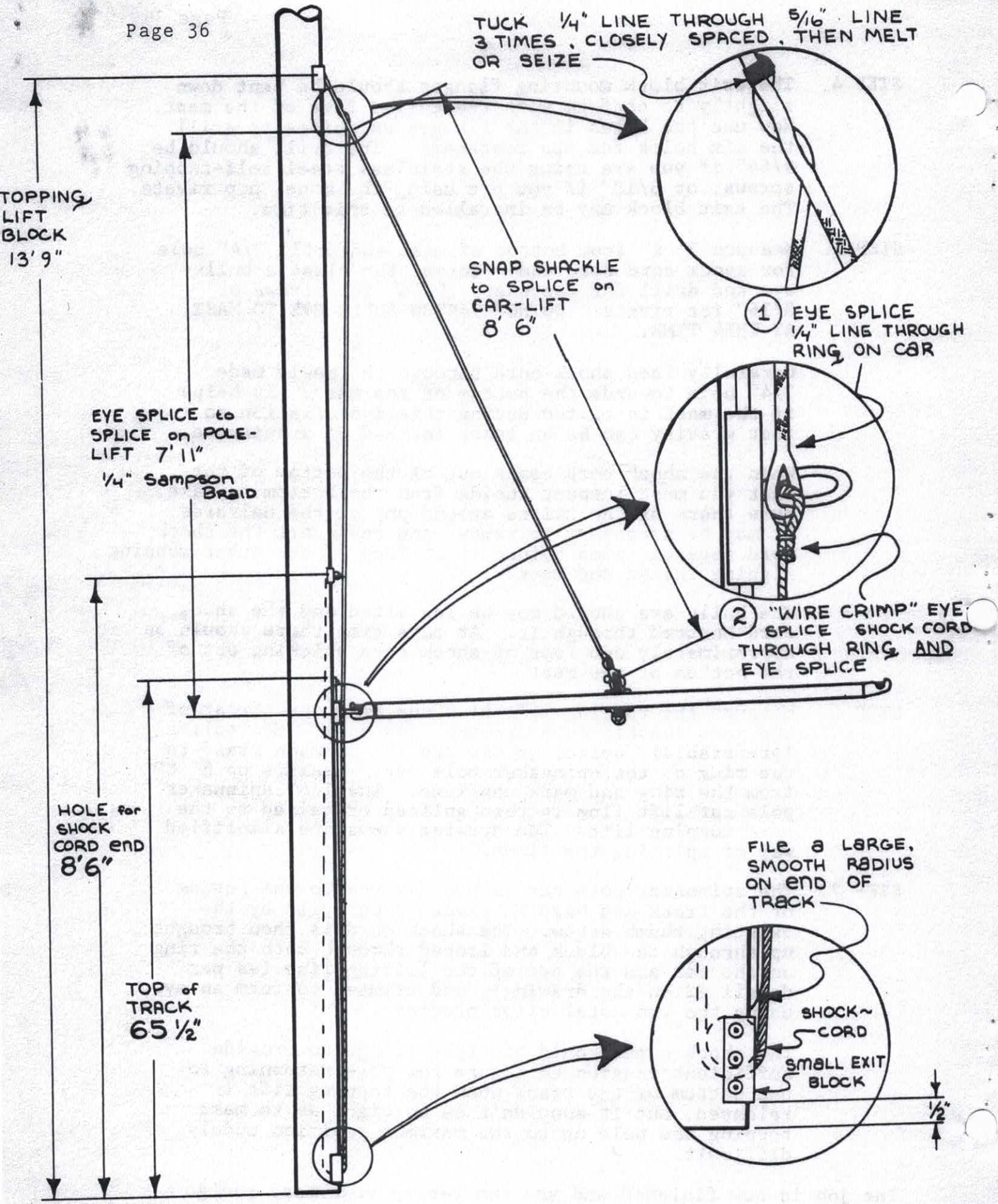
The bulls-eye should now be installed and the shock cord knotted through it. At this time there should be approximately one foot of shock cord sticking out of the bottom of the mast.

STEP 6. Measure the topping lift 9' 2" up from the throat of the snap shackle (see drawing) and mark. Now splice (preferable), seize, or tie the Samson Braid to the ring on the spinnaker pole car. Measure up 8' 8" from the ring and mark the line. The 1/4" spinnaker pole car lift line is then spliced or seized to the topping lift. The drawing shows one simplified way of splicing the lines.

STEP 7. The spinnaker pole car is now lowered to the bottom of the track and held in place temporarily by the existing thumb screw. The shock cord is then brought up through the block and looped through both the ring on the car and the eye of the lifting line (as per detail #2 on the drawing), and crimped to form an eye using the two metal clips provided.

The shock cord should be tight enough to provide sufficient tension to insure the pole returning to the bottom of the track when the topping lift is released, but it shouldn't be so tight as to make topping the pole up to the maximum position unduly difficult.

The job is now finished and you can restep your mast and go sailing with your new automatic pole lift.



SANTANA 20 AUTOMATIC SPINNAKER POLE LIFT R.S. TRUESDELL 6/28/78

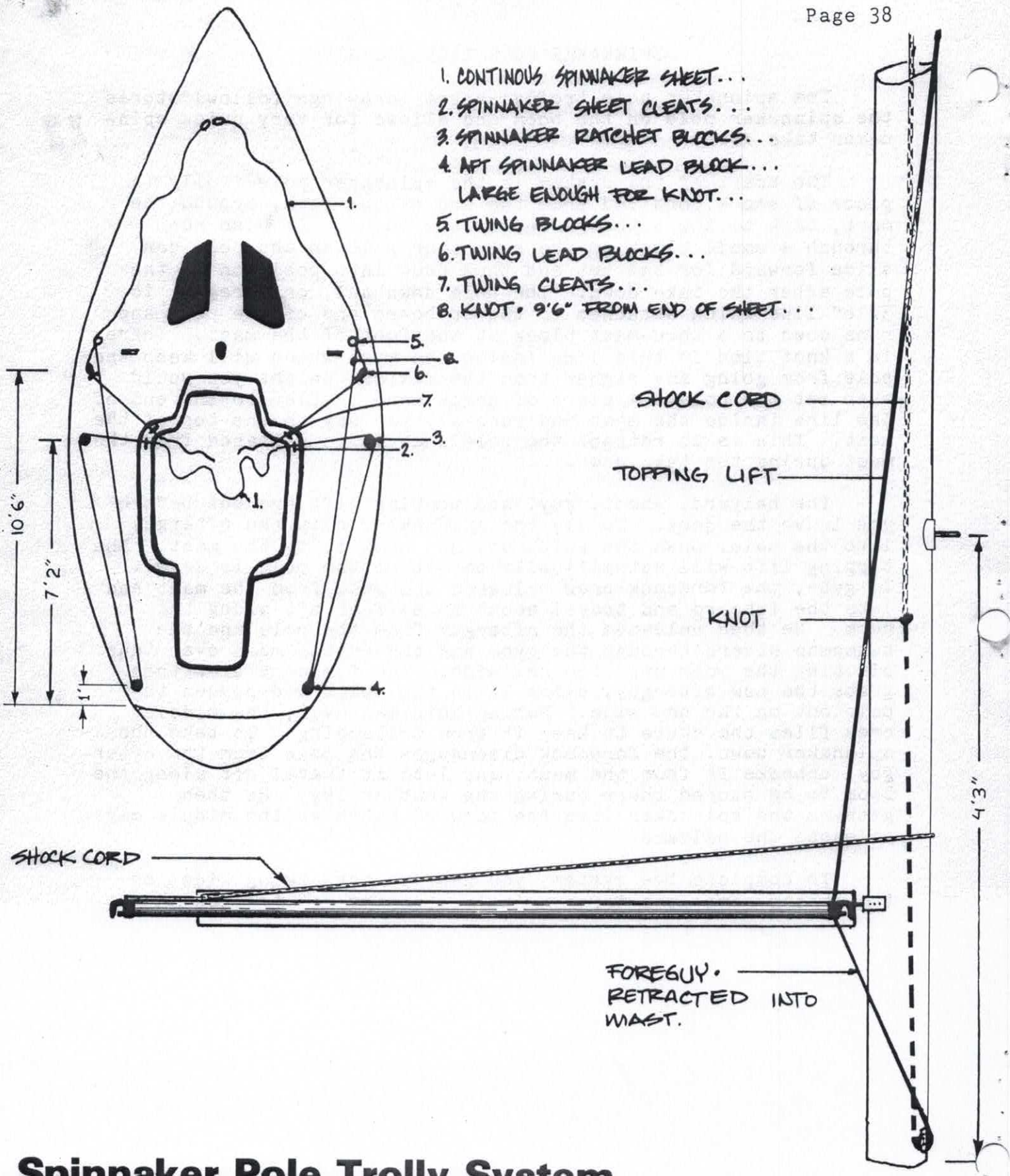
SPINNAKER POLE TROLLY SYSTEM

The spinnaker pole trolly system (drawings follow) stores the spinnaker pole on the boom and allows for very quick spinnaker take down.

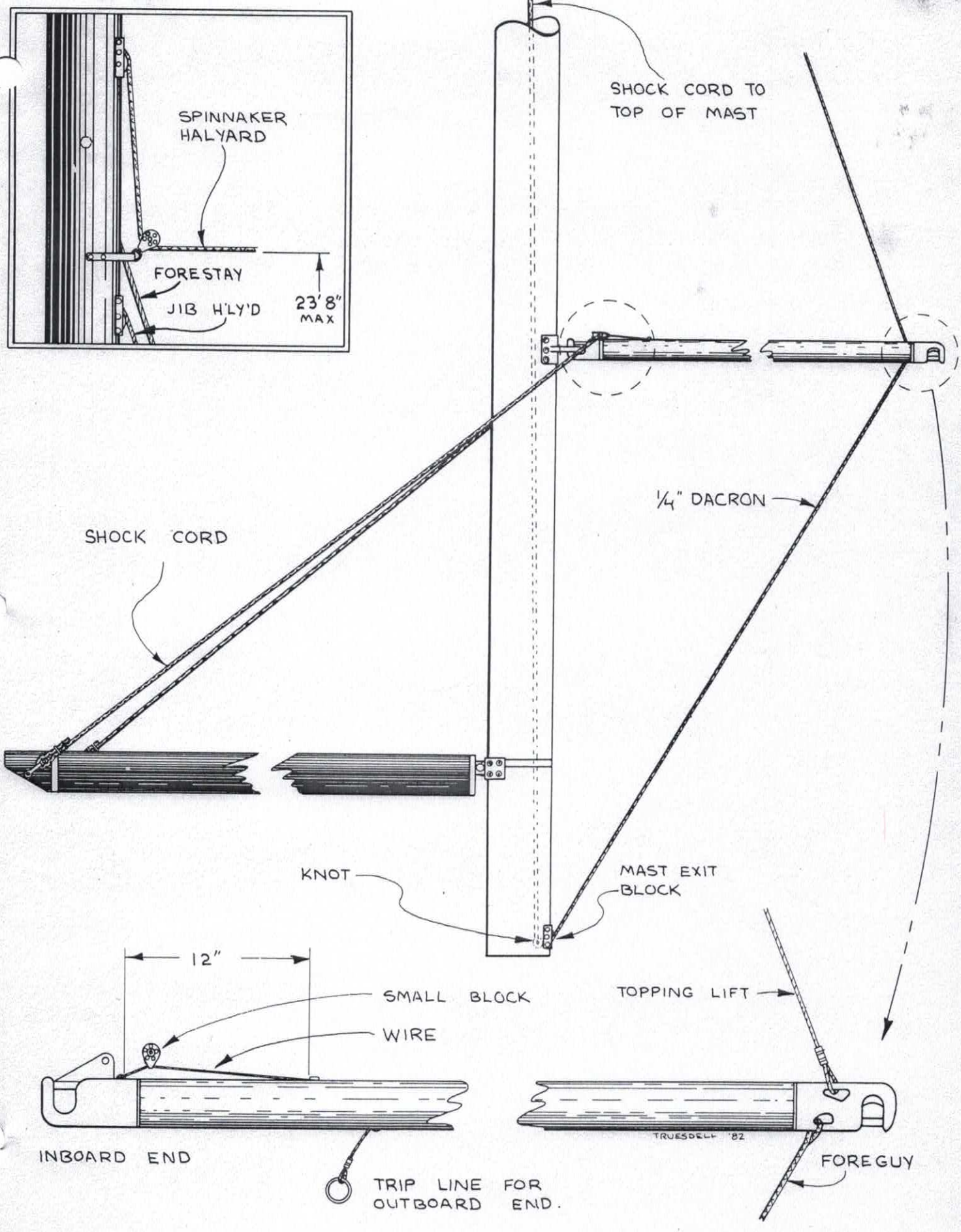
The heart of the system is the spinnaker pole trolly (a piece of shock cord led from the end of the boom, around the mast, back to the outboard end of the boom). It also runs through a small block on the spinnaker pole so the pole can slide forward for the set and then back into position on the pole after the take down. The pole downhaul, or foreguy, is 3/16" line which attaches to the outboard end of the pole and runs down to a thru-mast block at the foot of the mast. There is a knot tied in this line inside the mast which will keep the pole from going any higher than the maximum height you would ever set the pole. A piece of shock cord is tied to the end of the line inside the mast and runs all the way to the top of the mast. This is to retract the pole when it is released from the mast during the take down.

The halyard, sheet, guy, and topping lift are set before you leave the dock. To fly the spinnaker, clip the afterguy into the pole, push the pole out, and hook it to the mast. The topping lift will automatically be set so the pole is level. To gybe, the foredeck crew releases the pole from the mast and lets the inboard end travel about three feet aft along the boom. He then releases the afterguy from the pole and the helmsman steers through the gybe and throws the main over thus pivoting the pole onto the new side. The foredeck crew then grabs the new afterguy, clips it in the pole, and pushes the pole out on the new side. During this maneuver, the middle crew flies the chute to keep it from collapsing. To take the spinnaker down, the foredeck disengages the pole from the afterguy, unhooks it from the mast, and lets it travel aft along the boom to be stored there during the weather leg. He then gathers the spinnaker into the forward hatch as the middle man releases the halyard.

To complete the system, you need to have twing lines on the sheets since the foreguy is led too far aft to keep the pole from skying. A twing is shown on the port side of the Deck Plan drawing. They are used during the gybe to keep the pole from raising up too high and during the reaching and running legs to keep the pole level. They are also very effective in keeping the spinnaker from swinging too much in heavy air downwind legs.



Spinnaker Pole Trolly System


SPINNAKER HALYARD
FORESTAY
JIB H'LY'D
23'8" MAX
SHOCK CORD TO TOP OF MAST
1/4" DACRON
SHOCK CORD
KNOT
MAST EXIT BLOCK
12"
SMALL BLOCK
WIRE
TOPPING LIFT
INBOARD END
TRIP LINE FOR OUTBOARD END.
FOREGUY
TRUESDELL '82

MAINTENANCE

Although fiberglass boats are nearly maintenance-free, they do require periodic attention in certain areas. A well-maintained fiberglass boat can look as good after five years as it did when it was brand new.

A. STANDING RIGGING

1. The standing rigging should receive a yearly inspection particularly around the swage fittings and nicropresses. Check for bent or broken strands. Since moisture runs down the twisted wires, it can get trapped in the middle of the wire and inside the swage fittings. The resulting rust will expand and crack the fitting. If defective strands are found, replace that piece of rigging immediately. Check all of the cotter pins, rivets, and nuts and bolts. Stainless steel doesn't show fatigue, so requires close inspection. Check the halyards to see that they are running on the sheaves properly. Oil the sheaves if needed. It is very important that they not run on dry axles which would cause deformities on the sheave.
2. It is recommended that the standing rigging be cleaned regularly to prevent rust and dirt stains on the sails. The rigging can be cleaned by lowering the mast and wiping everything down with paint thinner. The mast and spreaders should also be wiped off.
3. The turnbuckles should be kept clean. Salt water and grim often builds up on the threads and makes adjustments very difficult. Adjusting the shrouds without clean, well

lubricated threads will gall them and partially destroy them. This reduces the strength of the turnbuckle. Turnbuckle boots are available to help keep them clean and to reduce chafing on lines and sails.

4. The mast and boom are anodized aluminum and should never be cleaned with an abrasive material which would scratch. Dirt, smoke, and salt all stick to the aluminum oxide causing a dull and unsightly corrosive look. The mast and boom can be cleaned with fresh water and an automobile polishing compound. It is a good idea to wax them then with a good past wax. This will provide a protective coat which will last about six months. In order to prevent unnecessary chafing against the mast and spreaders, tie the halyards off away from the mast when you are leaving the boat.

B. FIBERGLASS SURFACES

1. If the boat is kept in salt water, it should be hosed off after each sail to remove the salt from the hull and deck. To be sure that all of the dirt is removed, a non-abrasive detergent can be used. Be sure this washing is followed by a thorough rinsing with fresh water.
2. The luster of the non-skid surfaces can be restored with a solution of fresh water and liquid detergent such as Mr. Clean. Use a heavy scrub brush and be sure to rinse the surface thoroughly to prevent streaking. Tidy Bowl is another effective product. Both contain an acid, so it is imperative that no solution be left on the deck or topsides.

3. Be sure to avoid any metal filings on the deck since they will leave small rust marks. Any rust marks that do get on the boat can be removed with oxalic acid or Teak Brite. Test a small portion first to check the results.
4. Small scratches in the gelcoat can be polished out with different weights of polishing and buffing compound. Bigger scratches may require filling with patching paste. This paste is gelcoat which has been thickened to a putty consistency. It comes in the standard gelcoat colors but should be tested against the fading of the boat. Gouges may need to be filled with a plastic auto body putty and then sprayed with the gelcoat. Any major damage should be professionally repaired since the application is quite technical.
5. It is a good idea to keep the boat covered when not in use.

C. BOTTOM PAINT

1. The smoothness of the bottom is as important to the boat's performance as is the cut of the sails.
2. Be sure to carefully read the directions for the paint you have selected. Different parts of the country have varied successes with individual paints because of the varying climates, temperatures, salt content, etc.
3. The bottom must be thoroughly sanded and etched before being painted to assure removal of all wax, dirt, and film, and to assure a good mechanical lock of the paint.

4. The W. D. Schock Corporation recommends that all boats which will be left in the water be carefully treated prior to the application of bottom paint as follows:
   a. Use U. S. Chemical's Duro Glass as a putty to fair the keel, rudder, and bottom.
   b. Apply two coats of epoxy primer #404 barrier coat made by International Paint.

   We have found this process to be an excellent deterent to gelcoat blistering.

D. DECK HARDWARE

1. It is very important that all deck hardware be kept clean. It is made of either anodized aluminum,, stainless steel, or chrome plated brass, and can be cleaned with either metal or chrome polishes. A coat of wax after the polishing will provide a protective coating. Again, stay away from abrasive materials that scratch the surface.
2. The chainplates should receive an annual inspection. The holes where the clevis pins are installed should be carefully checked to be sure there has been no elongation. The chainplate covers should be removed to check for any electrolysis that may be occuring underneath them. If any cracking or fatiguing is detected, the chainplates should be replaced. Be sure to reinstall the chainplate covers with a bedding material such as silicone or Dolphinite to prevent leaking.
3. Winches require regular cleaning and oiling with a light-weight lubricant.

E. DECK LINES

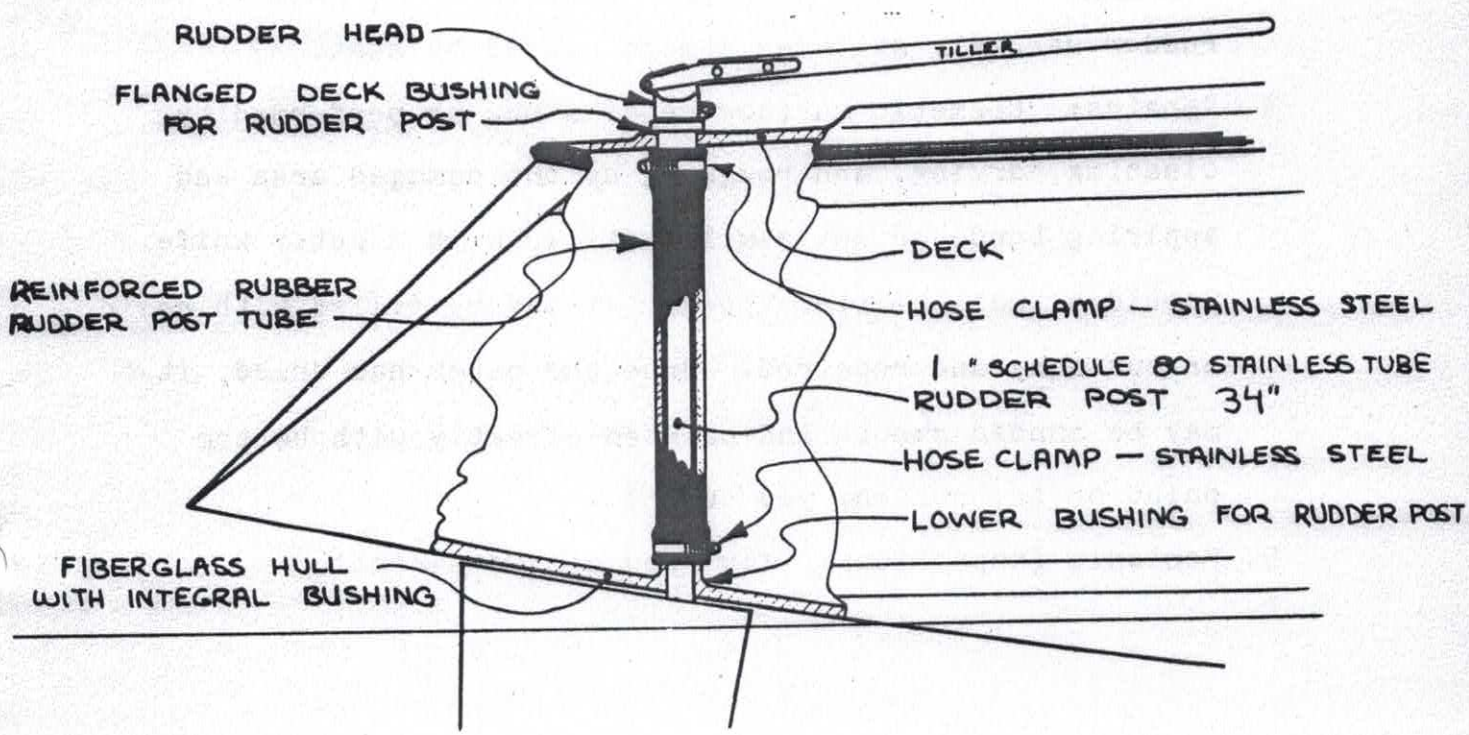
1. All lines, especially in salt water areas, should be soaked periodically in a bucket of fresh water to remove all salt. This will keep them more pliable.
2. Keep your lines coiled and stored in a dry spot where there is less chance of mildewing.

F. LIFELINES AND STANCHIONS

1. The plastic coating is best cleaned with paint thinner applied on a rag.
2. The stem should be cleaned with a polish.
3. Check the bases and all other mechnical fastenings for water.

G. RUDDER

1. The rudder has a stainless steel post and backbone and is made of high density polyurethane foam with a glass covering. A drawing of the rudder assembly is shown below.



2. The urethane core is composed of a strong rigid closed cell urethane. Water, diesel, solvents or marine borers will not damage your rudder blade, even if the glass coating has been damaged.
3. Painting the Rudder: When you paint your rudder the first time, particular attention should be paid to the paint manufacturer's instructions for preparing the surface. Solvent washing is not enough. The rudder must be sanded heavily to remove a heavy coating of mold release. We recommend white paints be used. White is a popular color as it is easy to see weeds and other debris which can catch on your rudder. WE DO NOT RECOMMEND THE USE OF DARK COLORS ON YOUR RUDDER, as they generate heat when the boat is out of the water in the sun. Since the rudder is made of cellular material this heat can cause dimensional changes and cosmetic damage. If the rudder is painted with a dark color it should be shielded from the sun with a <u>white</u> wrapping when the boat is out of the water. The rudder warranty excludes damage caused by heat.
4. Repairs: Cosmetic surface repairs may be performed by cleaning, drying, and roughing up the damaged area and applying bondo or any similar filler with a putty knife. Should a small blister appear, it may be filled with resin or cut away and repaired. Once the patch has dried, it may be sanded smooth and painted directly with bottom paint or any coating you desire.
5. Periodic Inspections: You should make periodic

inspections of your rudder and look for possible damage from grounding or electrolysis. Slight bends or shaft erosion often are not noticed until the shaft fails in heavy sea conditions.

H. WOODWORK

1. All of the woodwork on the Santana 20, with the exception of the tiller, is teak veneer plywood. This is a low-maintenance wood but should not be ignored. If ignored, it will check and crack.
2. The interior woodwork should receive a good oiling at least once a year. We recommend Watco Teak Oil.
3. The exterior teak should be oiled every three months or so. It should be sanded first to remove all dirt and salt. If you prefer the lighter appearance of teak, use Teak Brite. It cleans the teak and polishes it to a lighter color. If you prefer the darker, more natural look, use teak oil such as Watco.
4. The tiller is oak and requires regular varnishing. An unvarnished tiller will crack and weaken substantially. It is a good idea to cover the tiller when not in use to protect it from the ultra-violet rays and from the weather.

I. INTERIOR FABRIC CARE

1. Our supplier recommends that the cushion covers never be removed from the foam for cleaning. For spot cleaning, it is best to use an upholstery cleaner available over the counter. For more major cleaning, the cushions should be taken to a professional upholstery cleaning company. They

should not be dry cleaned. If the cushions are soaked clear through, it is still best not to remove the foam. Unzip the covers and do whatever possible to lift the fabric away from the foam. Then leave the cushions outside to dry. The drying process will be lengthy, but the cushions will hold their shape.

STORAGE CRADLE

It is very important that your storage cradle properly fits your boat. The drawing on the following page details the dimensions of the factory-built cradle. It is designed so the support is distributed with 50% of the weight on the keel and 50% of the weight shared equally by the four cradle pads. The pads are adjustable in the event that the boat is placed too far forward or too far aft. The cradle should be placed on a level surface.

Having a trailer that properly fits the hull is equally as important. The loads should be distributed as described above.

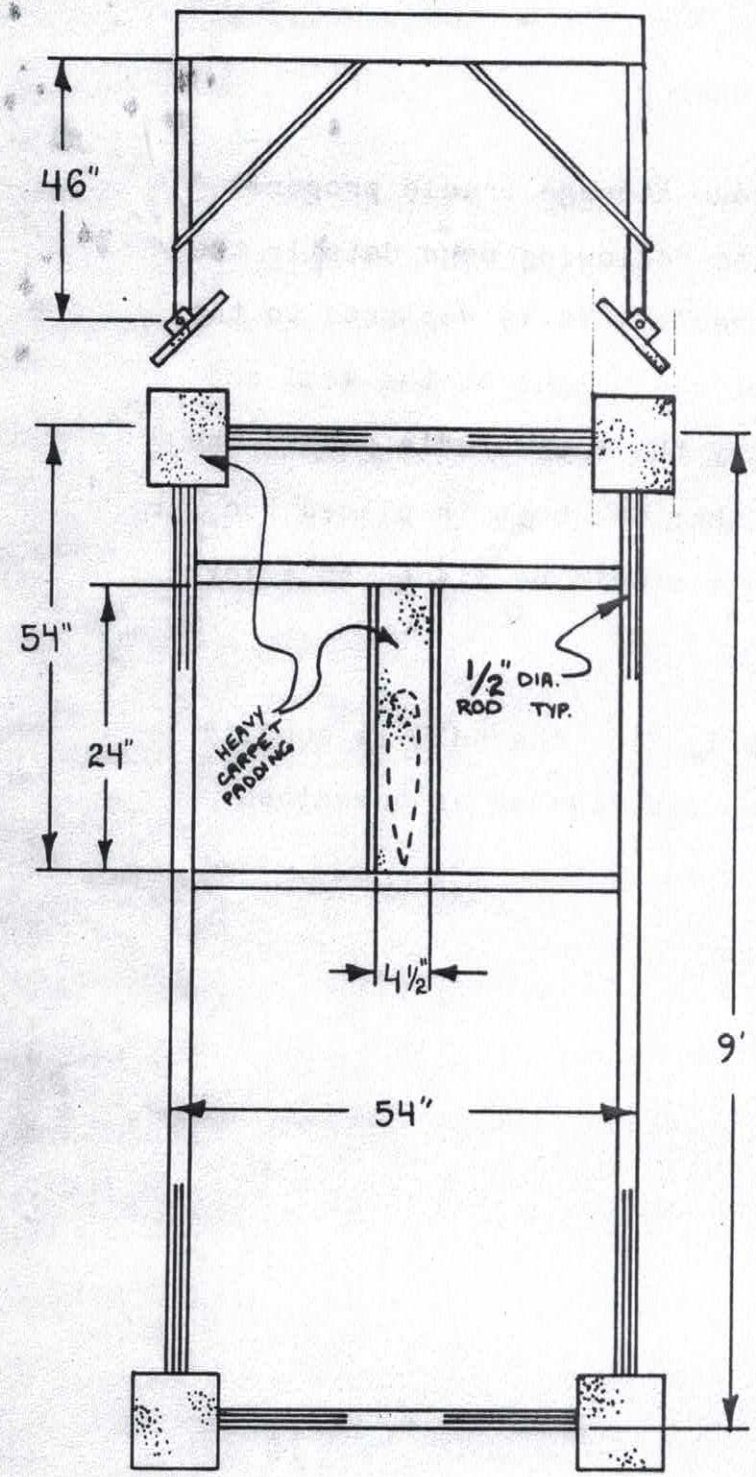
SANTANA 20

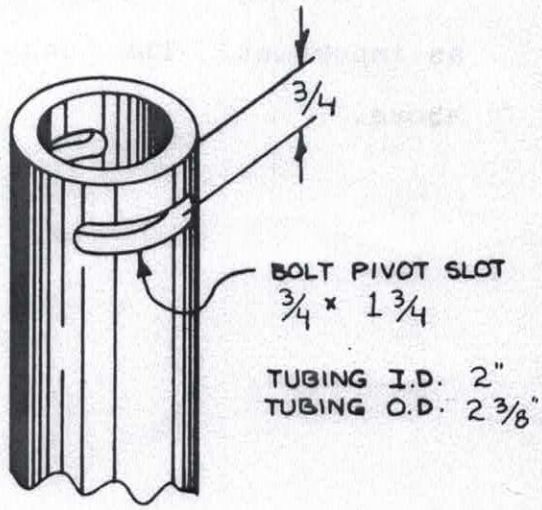
CRADLE

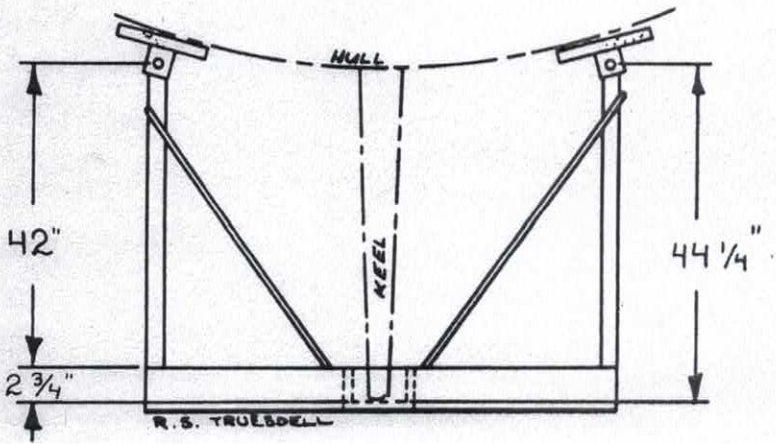
JULY 2,1978

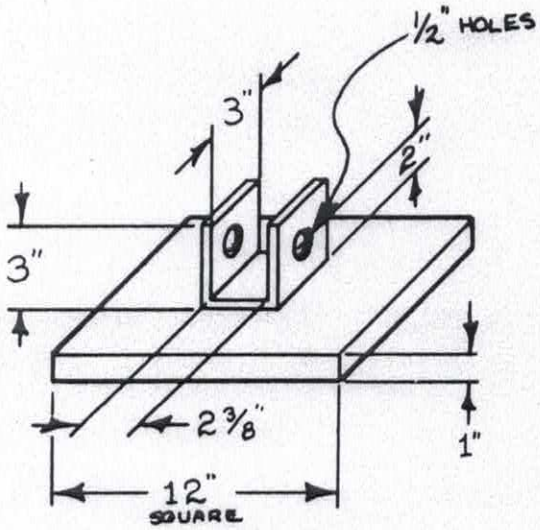
MATERIALS LIST:
3" x 1½" CHANNEL IRON – 36'
3" x 3" CHANNEL IRON – 1' 2"
2⅜" O.D. 3/16 WALL TUBING – 16'
½" DIAMETER ROD – 35'
12" x 1" WOOD – 4'
6 - 7 sq. ft. HEAVY CARPET PADDING
5" x 1½" CHANNEL IRON – 24"

THE ABOVE MATERIALS ARE RECOMMENDATIONS ONLY AND MAY BE CHANGED TO SUIT LOCAL AVAILABILITY.









PAD DETAIL – 4 REQUIRED