

Tuning the Santana 21

Tuning the rig on a Santana 21 is relatively simple. It should be done in the water and while sailing in fairly steady winds between 10-15 mph.

Step 1. At the dock. Sails should be removed.

- a. Be sure that all turnbuckles are balanced, i.e. that the top and bottom threaded sections are screwed into the turnbuckle body an equal distance.
- b. Adjust the forestay and backstay so that the mast is vertical in the fore and aft plane.

(IMPORTANT: When adjusting any turnbuckle always grip the upper threaded section with pliers or wrench to keep it from turning as the turnbuckle body is turned. A shroud or stay that is twisted may suffer premature failure or cause the turnbuckle to loosen.)

Adjust until there is no slack in the stays. Then tighten each turnbuckle three full turns.

- c. Adjust the upper shrouds so that the mast is vertical in a port starboard plane. Adjust until there is no slack.
- d. Adjust the lower shrouds. On most Santana 21s the lowers have an adjustable jibstay plate instead of a turnbuckle. Adjust to the tightest possible setting. Because the plate adjusts in increments only you may not be able to tighten the lower sufficient to remove all slack but that the lower cannot be pulled tight enough for the next setting. Do not worry about this. Just be sure that the mast is straight and not bowed to port or starboard. Do this by sighting up the mast with your eye at the base.
- e. If the boat is equipped with aft lower shrouds they should be adjusted to the point when there is no slack. The aft lowers serve to put a limit on the amount of forward mast bend. Some mast bend is necessary for best windward performance when racing.
- f. Now tighten the upper shrouds two full turns.
- g. Now tighten the backstay turnbuckle until there is about a 1" to 2" forward deflection in the mast.

(continued . . .)

Step 2.

Sailing close hauled to windward. You will note that the leeward shrouds will be sagging and loose.

- a. Tighten the leeward upper shroud two full turns.
- b. Tack and tighten the now leeward shroud two full turns.
- c. Tighten the lowers to the next increment using the same procedure.
- e. Repeat a and b until the leeward shrouds have just a perceptible amount of sag.
- f. Recheck the lowers and tighten if possible. Do not force.
- g. Secure all turnbuckles with cotter pins or the lock nuts. Be sure the clevis pins are secured in the lower shroud plate.

This completes the tuning process.

NOTES:

1. New rigging will stretch a little and require subsequent retuning.
2. Mast failures. There's no sure way to prevent a mast failure. Common causes are: Carrying too much sail for the wind.
Sudden loads caused by severe wind gusts.
Excessive forward mast bend.
Frayed and/or worn rigging.
3. Unload the rigging before unstepping the mast. Do this by loosening the shrouds on the port or starboard side. Remember the number of turns so that the turnbuckle can be retightened when the mast is stepped later.
4. Keel angle. The angle of the keel in the lowered position should be the same as the angle of the leading edge of the keel hinge casting. When set, mark the keel cable at a convenient spot near the winch for future reference.

(Prepared by the Santana 21 Association. These tuning instructions are only a general guide. Because of the many variables such as how the boat is handled, wind conditions and the condition of the boat, its rigging and other parts, the Santana 21 Association assumes no responsibility or liability as a result of using these tuning instructions.)

HOT BOATS HAVE EXTRA GEAR

There are certain things you can do to your boat to make it more competitive in the upcoming National Championship Regatta as well as in your local fleet racing. Here are some popular additions:

1. Roller-bearing mainsheet traveler
2. Aft lower shrouds
3. Backstay adjuster
4. Lead some control lines to cockpit
5. A good compass
6. Easy-to-read speedometer
7. Tiller extension
8. Boom vang

By popular consensus, the most efficient location for a traveler is at mid-cockpit across the seats, just forward of your tiller handle. Configure it so you can work the cam cleats easily sitting up on the combing. The traveler gives you the independent control at your boom position when on the wind, so that the mainsheet has fuller control of main shape through leech tension.

The tiller extension will allow you, as helmsman to do your part in balancing the boat while steering, comfortably.

You've got to have a means for course analysis, provided by a compass. Many appreciate the ability to perceive the pick-up of 0.2 knots speed furnished by a speedometer. The best ones are especially easy to read while minimizing drag, and we opted for the 4½" dial Signet model with a small paddle-wheel transducer.

An easy-to-use backstay adjuster lets you control jib-stay sag for on-the-wind pointing ability or de-power your mainsail by bending the mast. We use a 10:1 arrangement similar to the 12:1 offered with the Santana 525 (see attached diagram) except ours has the wire sheave cable attached to a new tang a few inches to the other side of the tiller.

The Santana 21 standard mast is quite bendy, which is a good feature for casual daysailing--it can keep the boat more stable with an unexpected heavy puff--

but we lose too much power for efficient sailing unless we use aft lower shrouds to control mast bend. Your aft lowers are best left a tad loose--certainly, they should not interfere with stepping the mast, as a consensus of opinion. The W. D. Schock Corp. has an aft lower kit which is probably still available. Attached you'll find mounting instructions for boats with both the older and also the newer spreader mast fitting, but you must specify which one you have when ordering.

Many like to lead control lines to the cabin top, accessible from either the cockpit, companionway, or out by the shrouds. Among them, main cunningham, main outhaul, perhaps halyards, flattening reef, and others if you fly Genoas or spinnakers.

A boom vang is a safety device, keeping your boom from rising (paving the way for an accidental jibe) when you are on a run. It also is used to apply leech tension to control excessive leech curl when the boom is beyond the limits of your traveler. See attached Schock locating plan for a boom vang.

Attached you'll find pictures of a Texas Santana 21 having some of these extra features. It would be well to try to use equipment that is sized heavy enough to do the job safely, but avoid the extra weight and windage of oversized or unnecessary gadgets positioned up high in the air stream. Beyond gadgets like these, there's no substitute for a clean, fair bottom, keel, and rudder as well as good sails.

Gary Hendrickson
Fleet #16
S21 #604 "Rag-a-Muffin"

SPECIFICATIONS

LOA 21'3"

LWL 19'4"

Beam 7'6"

Ballast 550 Lbs.

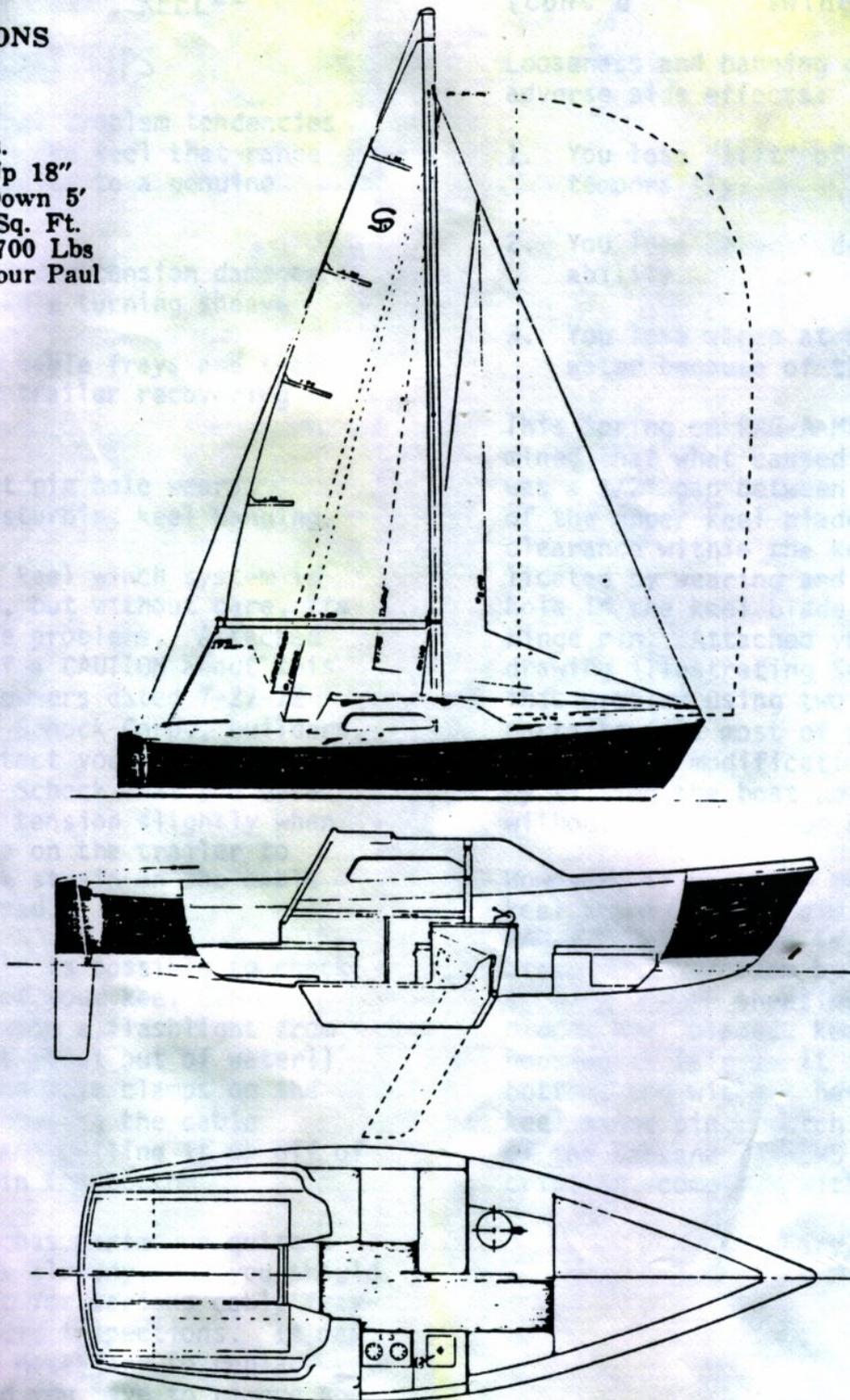
Draft, Board Up 18"

Draft, Board Down 5'

Sail Area 189 Sq. Ft.

Displacement 1700 Lbs

Designer, Seymour Paul



SANTANA 21

W. D.  **Schock** CORP.

YOUR SWING KEEL--

BOAT TIPS

There are several problem tendencies associated with the keel that range from nuisance value to a genuine catastrophe:

1. Excessive winch tension damages winch or cable turning sheave.
2. Keel winch cable frays and then parts (bad trailer recovering situation).
3. Hinge pivot pin hole wears, causing disturbing keel banging.

The Santana 21 keel winch system is very effective, but without care, its power can cause problems. Attached is your copy of a CAUTION about this to Santana 21 owners dated 7-27-72 from the W. D. Schock Corp., builders. To further protect your system, it is recommended by Schock that you ease off keel winch tension slightly when your boat is up on the trailer to avoid excessive strain on the cable while on the road.

Incidentally, it is possible to check the condition of your keel cable turning block with a flashlight from inside the boat (boat out of water!) by loosening the hose clamps on the rubber hosing housing the cable (newer boats) and pulling it up off of the neck hole in the bottom.

The keel cable has parted on quite a number of boats already, and you should keep an eye out for serious cable fraying with periodic inspections. It may one day become necessary to replace your keel cable, and you have to remove your keel to do this, at least later built boats. Attached find a copy of Schock's Santana 21 Removal and Installation Procedure for Keel.

(cont'd "Your Swing Keel")

Looseness and banging of your keel has adverse side effects:

1. You lose "lift" of your keel temporarily.
2. You lose several degrees of pointing ability.
3. You lose sleep at night on the water because of the racket.

This Spring on RAG-A-MUFFIN, we determined that what caused our keel banking was a 1/2" gap between the 1" thickness of the upper keel blade and the 1-1/2" clearance within the keel housing, complicated by wearing and enlarging of the hole in the keel blade for the keel hinge pin. Attached you will find a drawing illustrating Schock's fix for this problem using two 3/16" thick angle parts to fill most of the excess clearance. This modification can be done by lifting the boat up off your trailer, without removing your keel.

However, if you have to remove your keel anyway, as we did this Spring with RAG-A-MUFFIN, there is another way to attack this problem by fitting and attaching spacer sheeting to your upper hidden keel blades, keeping your keel housing as fair as it is now on the bottom, and without having to remove the keel hinge pin. Watch the next issue of the Santana 21 NEWS for a full description, complete with photos!

Gary Hendrickson

BOAT BUILDERS

 **Schock** CORP.

GREENVILLE STREET, SANTA ANA, CALIFORNIA 92704 • (714) 549-2277 • MANUFACTURERS OF FIBERGLASS SAILBOATS

SANTANA 21 KEEL REPLACEMENT

The Santana 21 was built with two different swing keels. The differences were in the shape of the top portion of the keel, in the type of block and tackle apparatus used in raising and lowering the keel, and in the style of centerboard well and cabinetry in the cabin.

Drawings of the two centerboard styles are attached. The best way to determine which style was used in your boat is to identify the interior centerboard trunk.

Replacement Santana 21 centerboards are available through the W. D. Schock Corporation. Since we no longer have these boards in stock, they must be special ordered. A lead time of approximately 6 weeks is required.

C A U T I O N

For your convenience, the Santana 21 has a very powerful keel winch. If the winch is force operated after the keel is fully retracted, damage will occur to either the winch or the keel block. OPERATE THE WINCH SLOWLY. DO NOT USE FORCE.

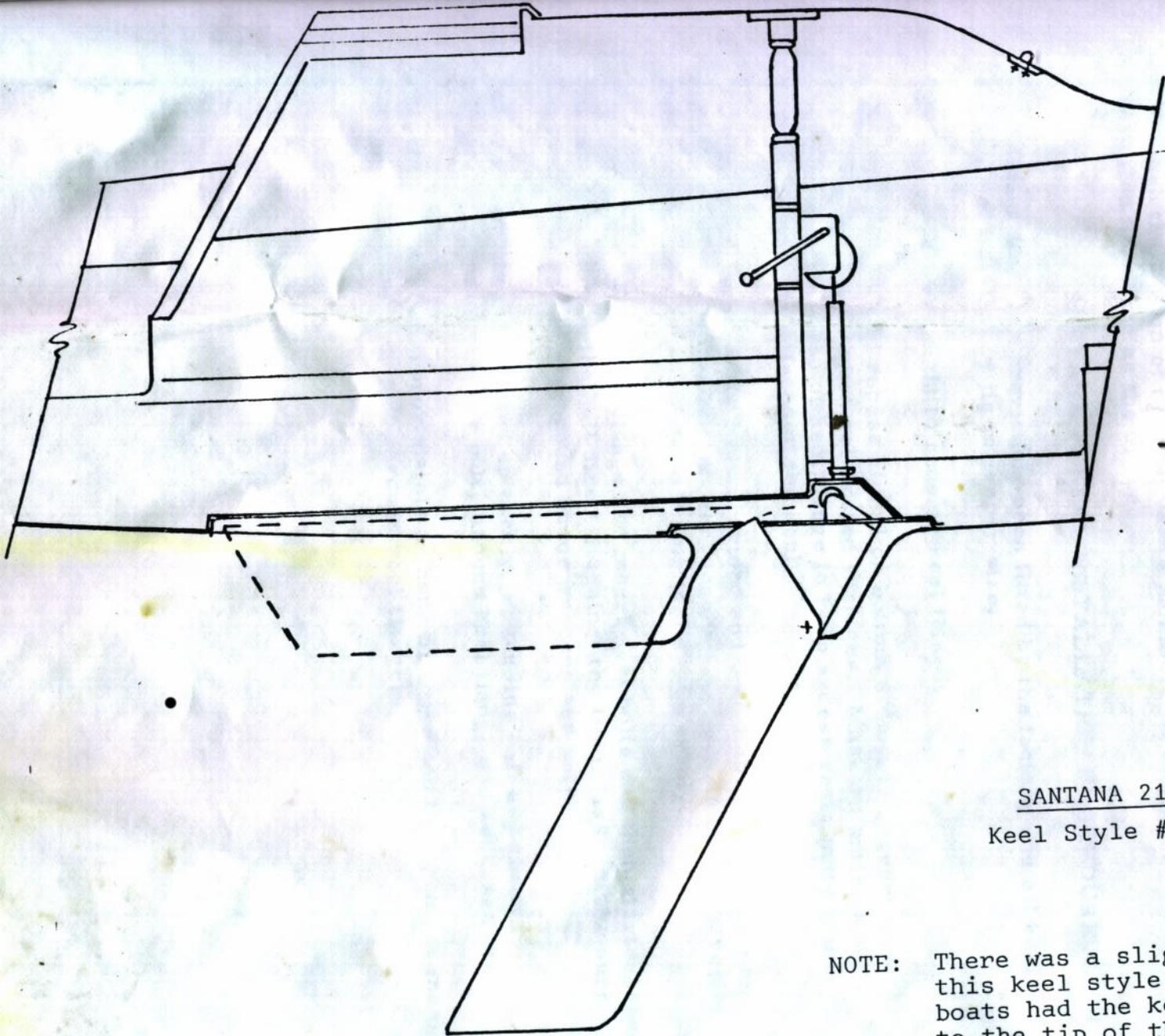
FOR BOATS WITH LINER
FIRST USE 5 1/2" HOLE SAW
& CUT LINER ONLY. THEN
USE 4 1/4" HOLE SAW TO
CUT G.B. CASE &
INSTALL 4" PYHI
INSPECTION PORT

4 1/2"

1 1/2"

SANTANA 21
Keel Style #1

MARINE FIBERGLASS PRODUCTS INC.	
3502 S. GREENVILLE ST. S.A. CALIF.	
BOAT: <u>SANTANA 21</u>	DWG: _____
SCALE: <u>3/4" = 1'-0"</u>	DATE: <u>FEB 10</u>
DRAWN BY: <u>(signature)</u>	APPROVED: _____



SANTANA 21
Keel Style #2

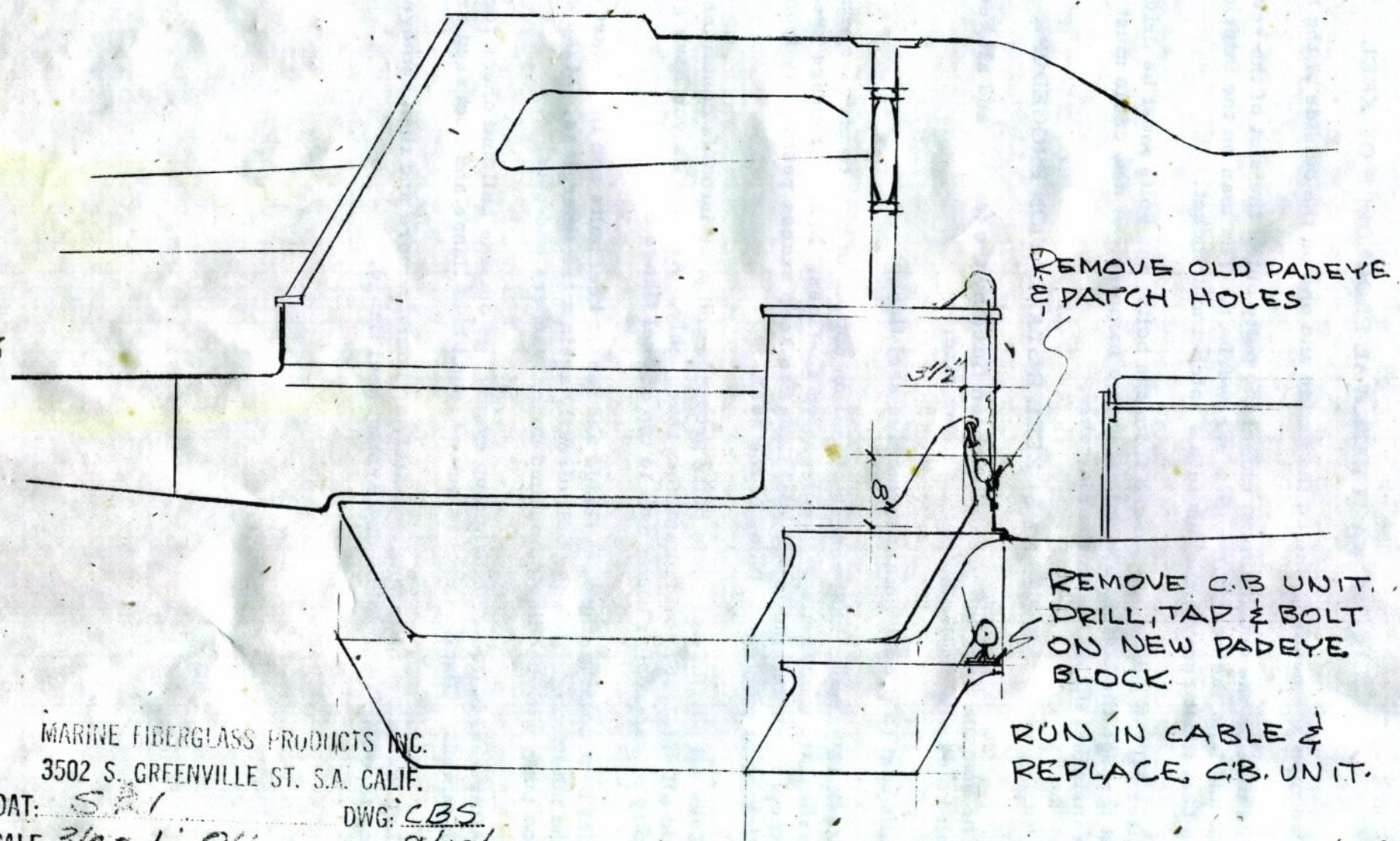
NOTE: There was a slight variation in this keel style. One series of boats had the keel cable attached to the tip of the keel. It went from there up to a winch located near the main hatch.

SANTANA 21 REMOVAL PROCEDURE OF KEEL

1. Two men are needed, one on the inside and one on the outside of the boat.
2. The man on the outside must chisel the putty out of the slot of the keel bolt and hold the keel bolt with a screwdriver. The man on the interior of the boat must remove the nut with a ratchet and socket.
3. After all the nuts are removed from the bolts, the bolts must be driven out through the bottom of the boat with a hammer. A new cable must then be installed the same as the old cable.

SANTANA 21 KEEL INSTALLATION PROCEDURE

1. The Santana Keel has previously been fitted by the factory and all keel bolt holes are drilled by jig to proper size.
2. Lift boat to proper height to receive keel flange.
3. Mask 12" around keel recess of hull on bottom of boat to prevent excess resin putty from getting on gel-coated surfaces. Mask off entire keel except for sides and top of keel flange to keep excess resin putty from sticking to painted surfaces of the keel.
4. Take all portions of resin putty provided and pour into one container and add all catalyst provided and mix thoroughly. As soon as you have resin putty mixed apply all contents to top of keel flange evenly.
5. Set boat down on the keel flange and insert keel bolts and then start washers and nuts from inside the hull directly against the fiberglass. Make sure you putty with bedding compound under washers and nuts.
6. After keel bolts are cinched up evenly, go outside hull and check for alignment. Glaze in excess putty around keel flange and recessed area.
7. Let the boat sit for approximately an hour or more and then remove masking tape and smooth up putty around keel flange.



REMOVE OLD PADEYE
& PATCH HOLES

REMOVE C.B. UNIT.
DRILL, TAP & BOLT
ON NEW PADEYE
BLOCK.

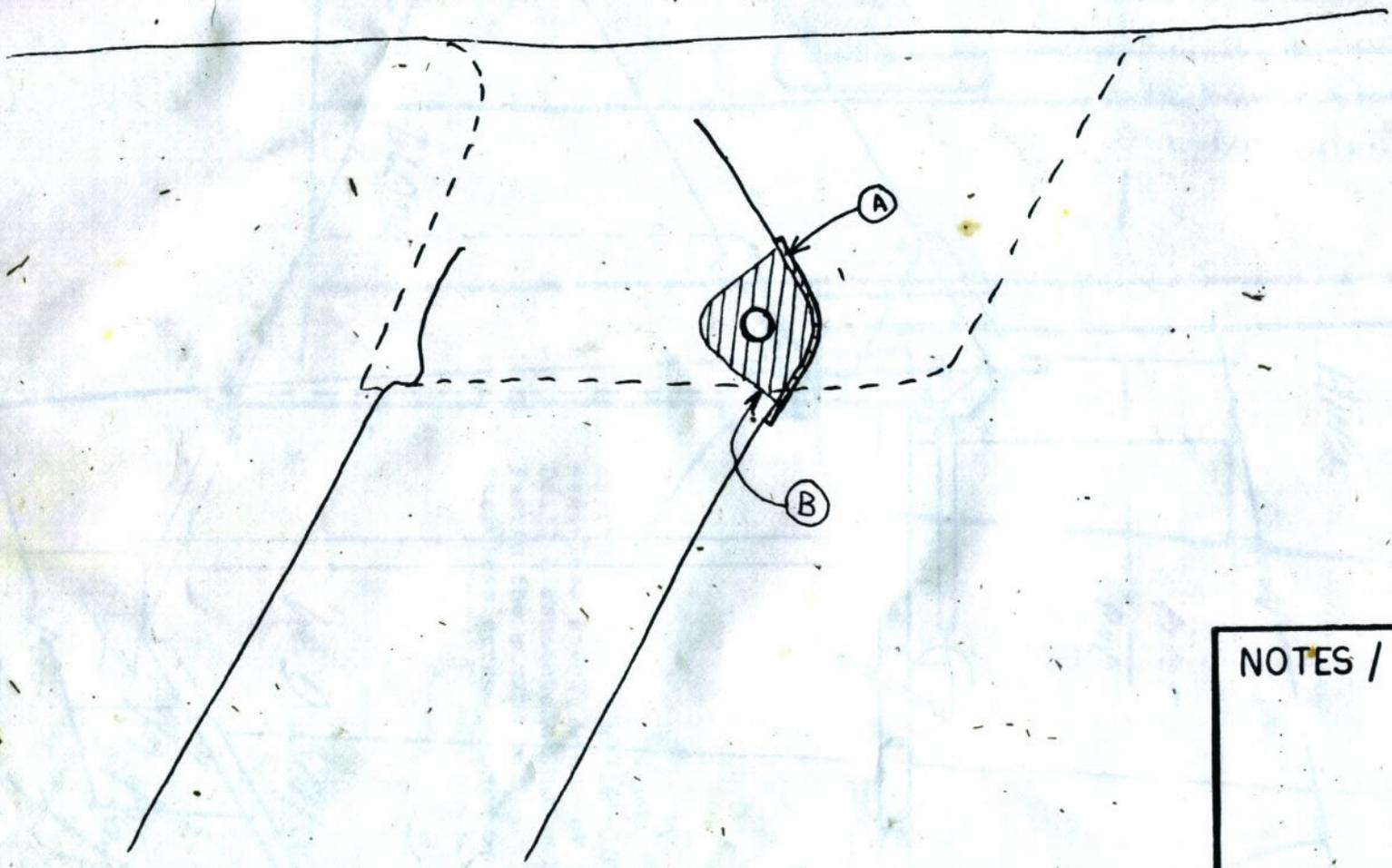
RUN IN CABLE &
REPLACE C.B. UNIT.

MARINE FIBERGLASS PRODUCTS INC.
3502 S. GREENVILLE ST. S.A. CALIF.

BOAT: SAI DWG: CBS
SCALE: 3/4" = 1'-0" DATE: 9/29/70
DRAWN BY: SP APPROVED: _____

STEP 1 : HOLE IN SWING KEEL SHOULD BE 1" ROUND. IF IT IS ELONGATED OR BIGGER THAN 1 1/8" IT SHOULD BE FILLED UP WITH WELD AND REDRILLED TO 1" DIA.

STEP 2 : A STRAP MAY BE WELDED ALONG THE LEADING EDGE AS IN (A) —OR— 3/16" PLATE MAY BE WELDED TO BOTH SIDES AS IN (B) —OR— BOTH



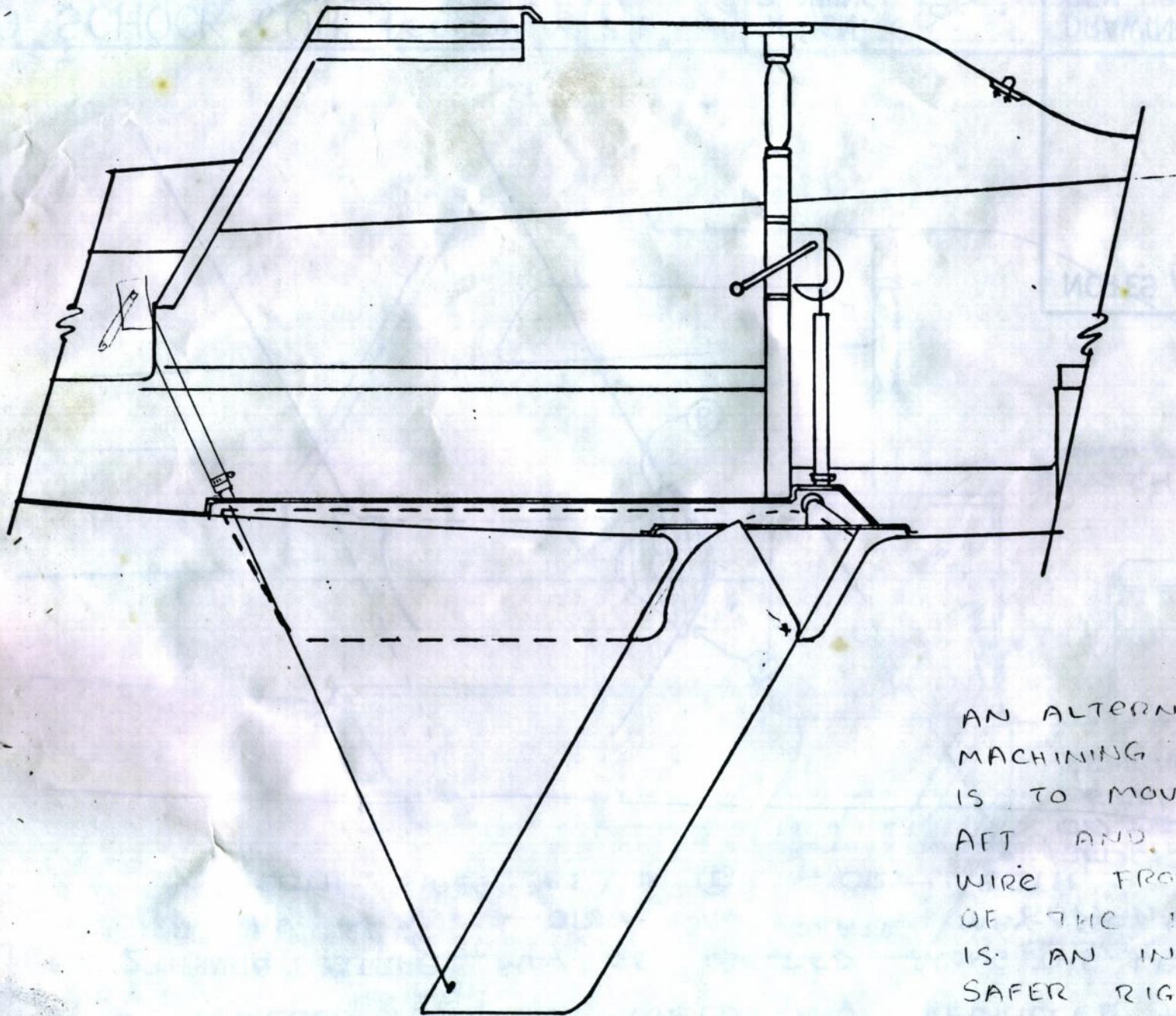
NOTES / MATERIALS:

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

SANTANA 21
SWING KEEL REPAIR

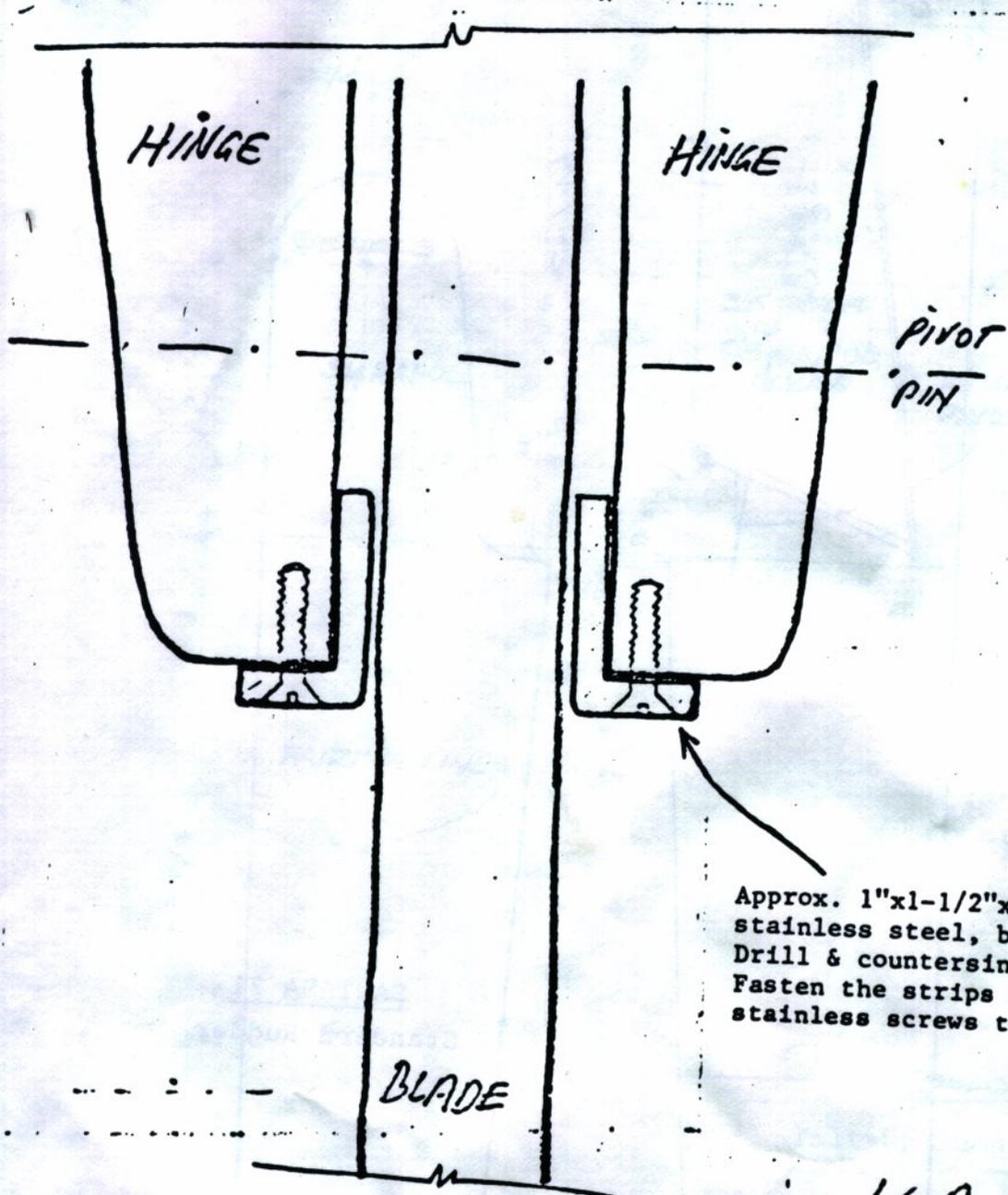
DESIGN: SCOTT
DRAWING:

DRAWING # 11/10/81
REV. DATE:



AN ALTERNATIVE TO
MACHINING THE GROOVE
IS TO MOVE THE WHEEL
AFT AND RUN THE
WIRE FROM THE BOTTOM
OF THE BOARD. THIS
IS AN INTRINSICALLY
SAFER RIG: EASIER TO
RAISE AND PUTTING LESS
STRAIN ON THE HINGE
PIN.

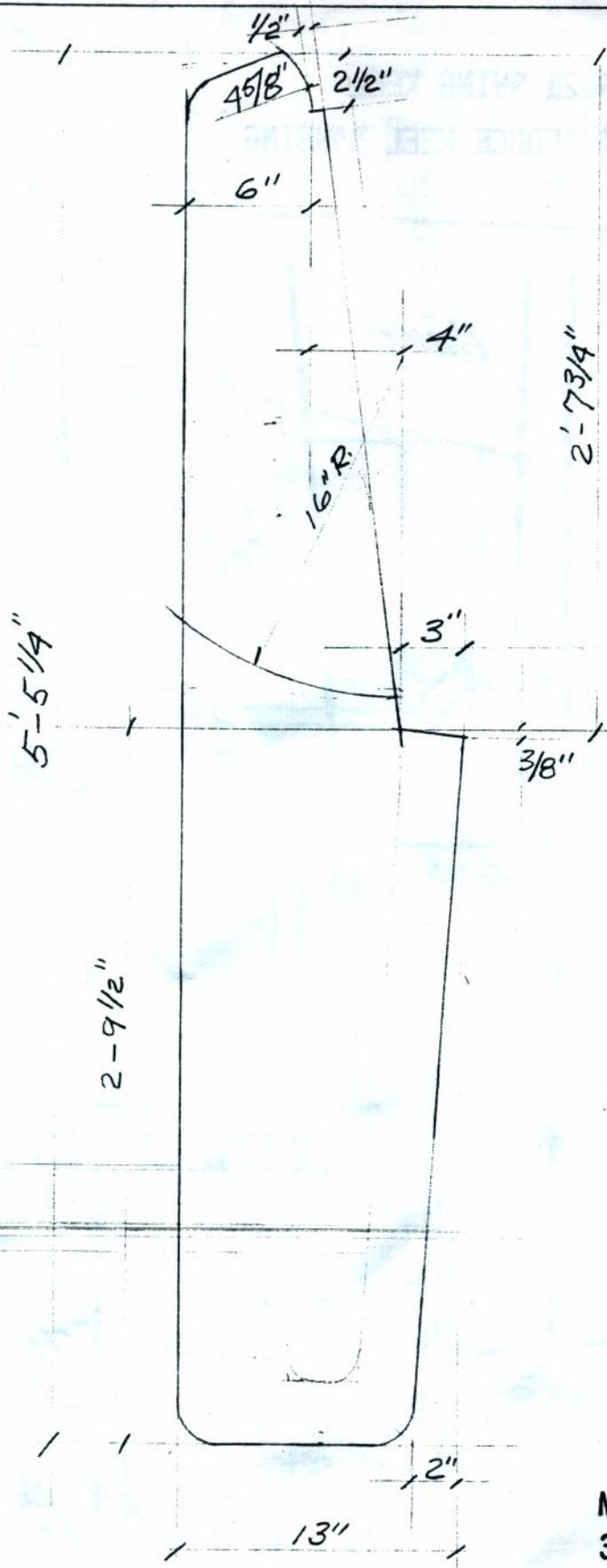
SANTANA 21 SWING KEEL
SHIM PLATES TO REDUCE KEEL BANGING



Approx. 1"x1-1/2"x3/16"x10" long angle
stainless steel, brass or steel.
Drill & countersink holes as shown.
Fasten the strips with 1/4"x20 CSK
stainless screws tapped up into hinge.

W.D. SCHOCK CORP

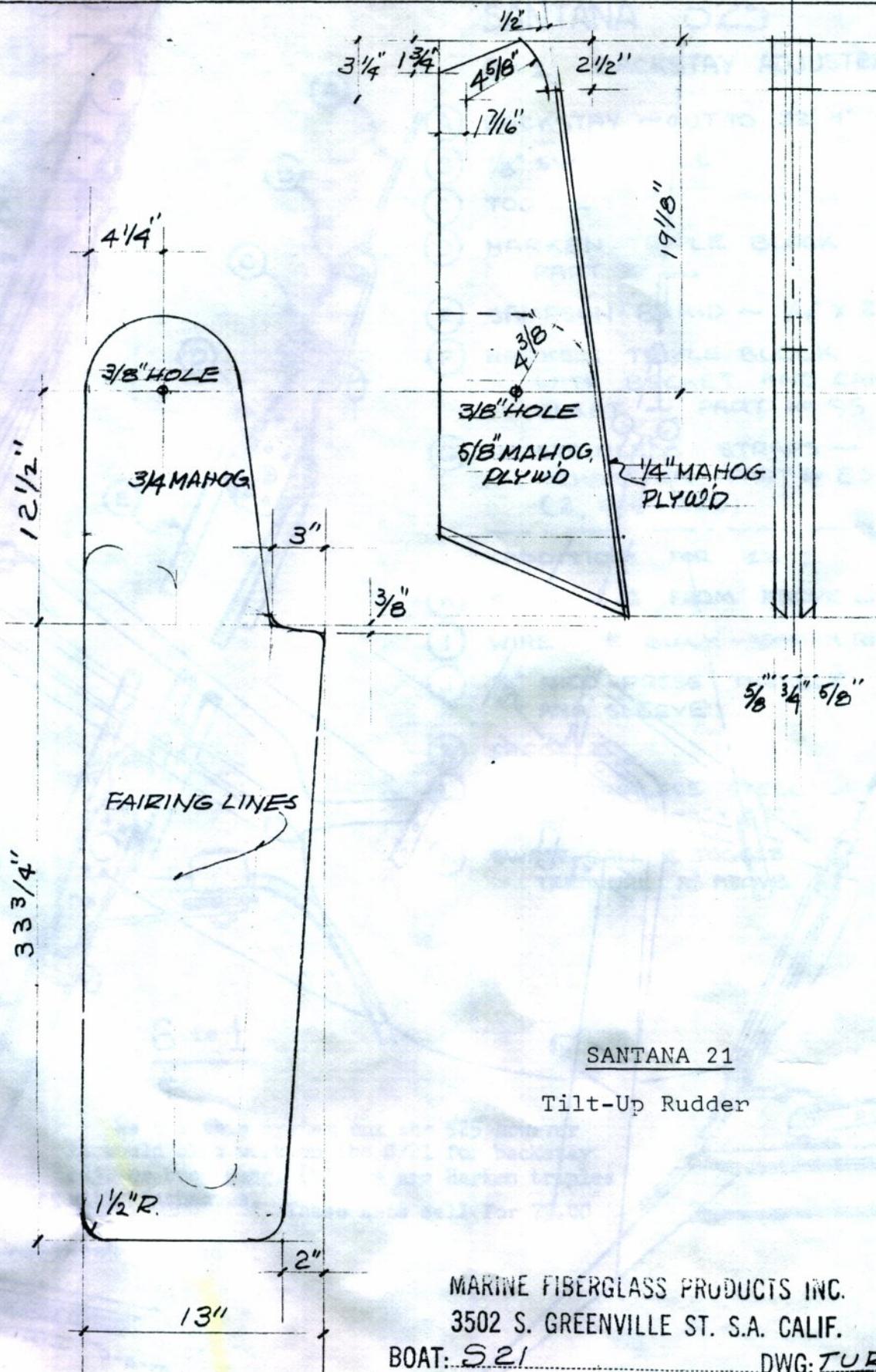
2/9/76
Schock



SANTANA 21
Standard Rudder

MARINE FIBERGLASS PRODUCTS INC.
3502 S. GREENVILLE ST. S.A. CALIF.

BOAT: S 21 DWG: R
SCALE: 1/2" = 1'-0" DATE: 2/9/76
DRAWN BY: SP APPROVED: _____

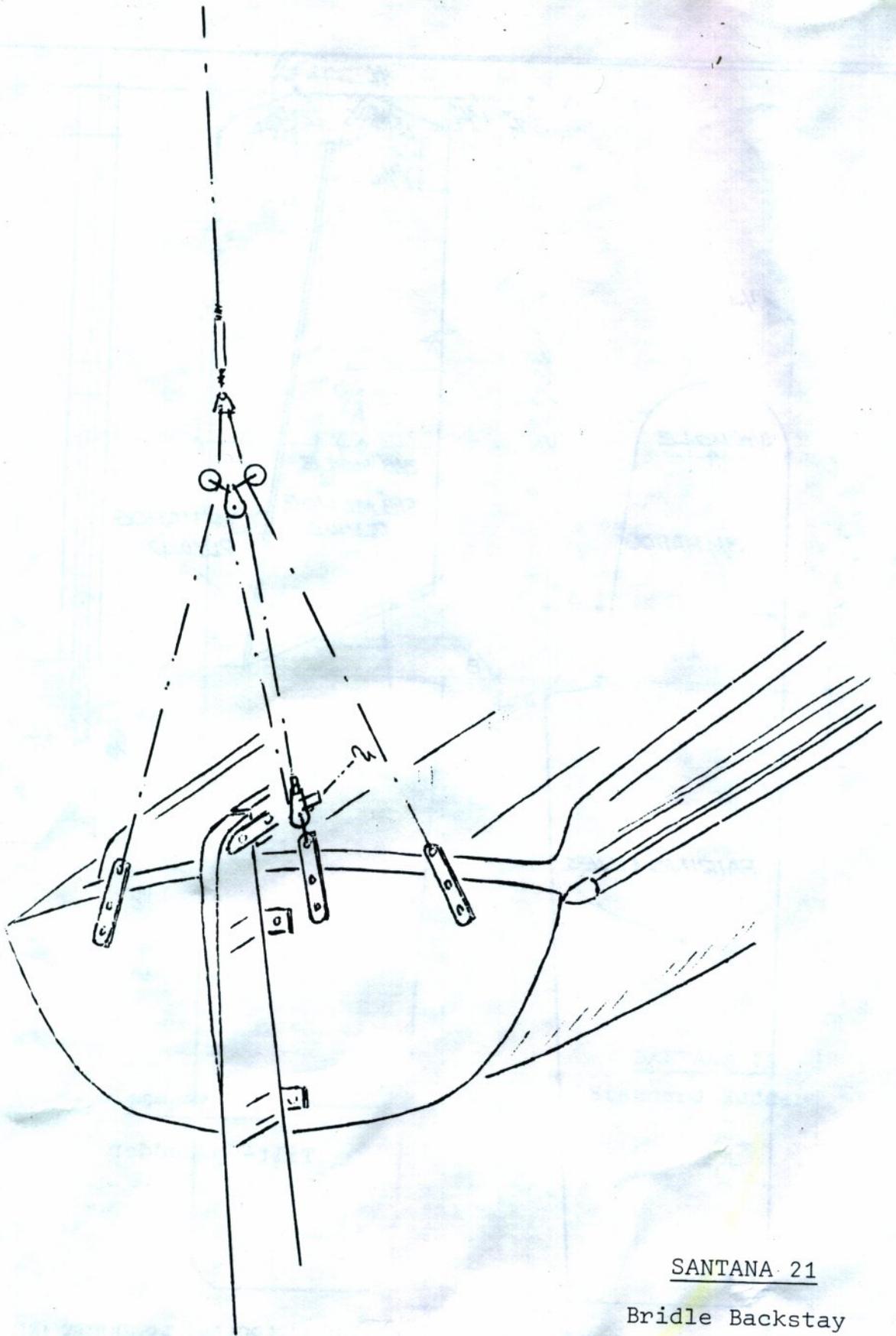


SANTANA 21

Tilt-Up Rudder

MARINE FIBERGLASS PRODUCTS INC.
 3502 S. GREENVILLE ST. S.A. CALIF.

BOAT: S 21 DWG: TUR
 SCALE: $1\frac{1}{2}" = 1'-0"$ DATE: 3/16/71
 DRAWN BY: S D APPROVED:



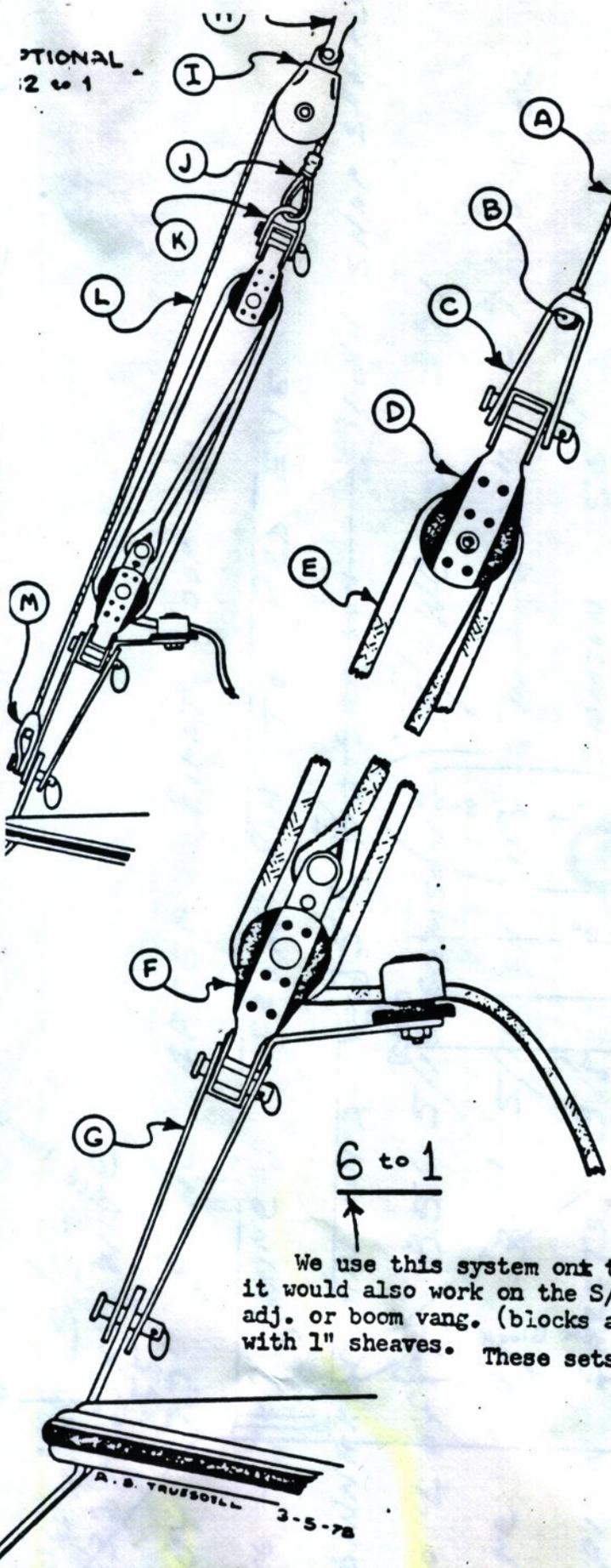
SANTANA 21

Bridle Backstay

OPTIONAL
2 to 1

SANTANA 525

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)

ADDITIONS FOR 12 : 1

- (H) A, B, & C FROM ABOVE LIST
- (I) WIRE ROPE BLOCK ~ RONSTAN RF 468
- (J) 1/8" NICO-PRESS THIMBLE AND SLEEVE
- (K) SHACKLE
- (L) 7x19 STAINLESS STEEL WIRE ROPE 1/8" x 27"
- (M) SWAGE BALL & TOGGLE TERMINAL AS ABOVE

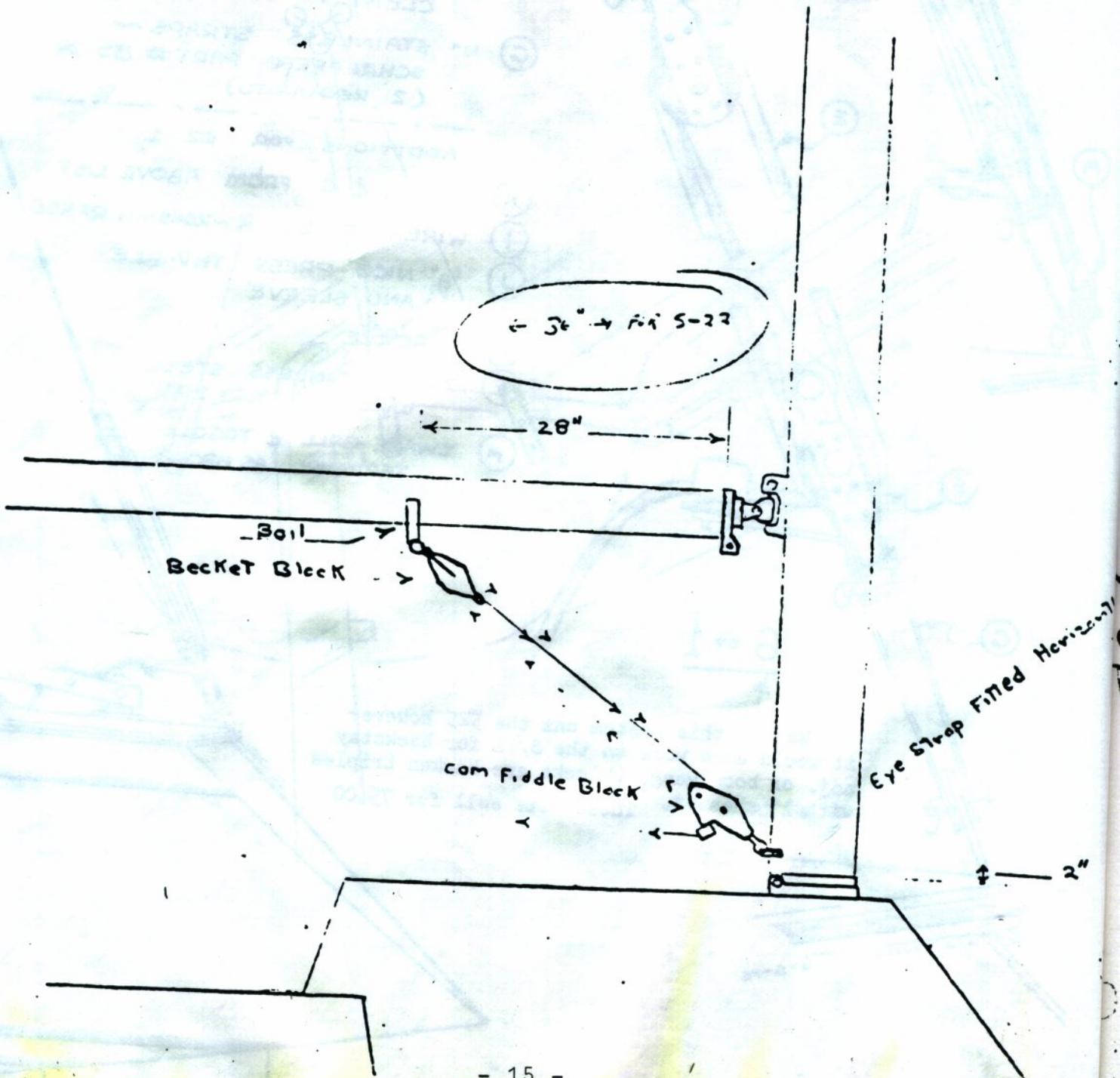
We use this system on the 525 however it would also work on the S/21 for backstay adj. or boom vang. (blocks are Harken triples with 1" sheaves. These sets sell for 75.00

A. S. TRUESDILL 3-5-78

S

SANTANA 21
C.A. BACKSTAY

Santana 21 Boom Yang location



Plan 2 / SPINNAKER POLE

2 1/4 Ring S/S -
 3/32 - 17x7 WIRE

CUT 75" LONG AFTER FIRST LOOP ON
 1/16 - 7x7 WIRE - FROM PIN TO PED EYE

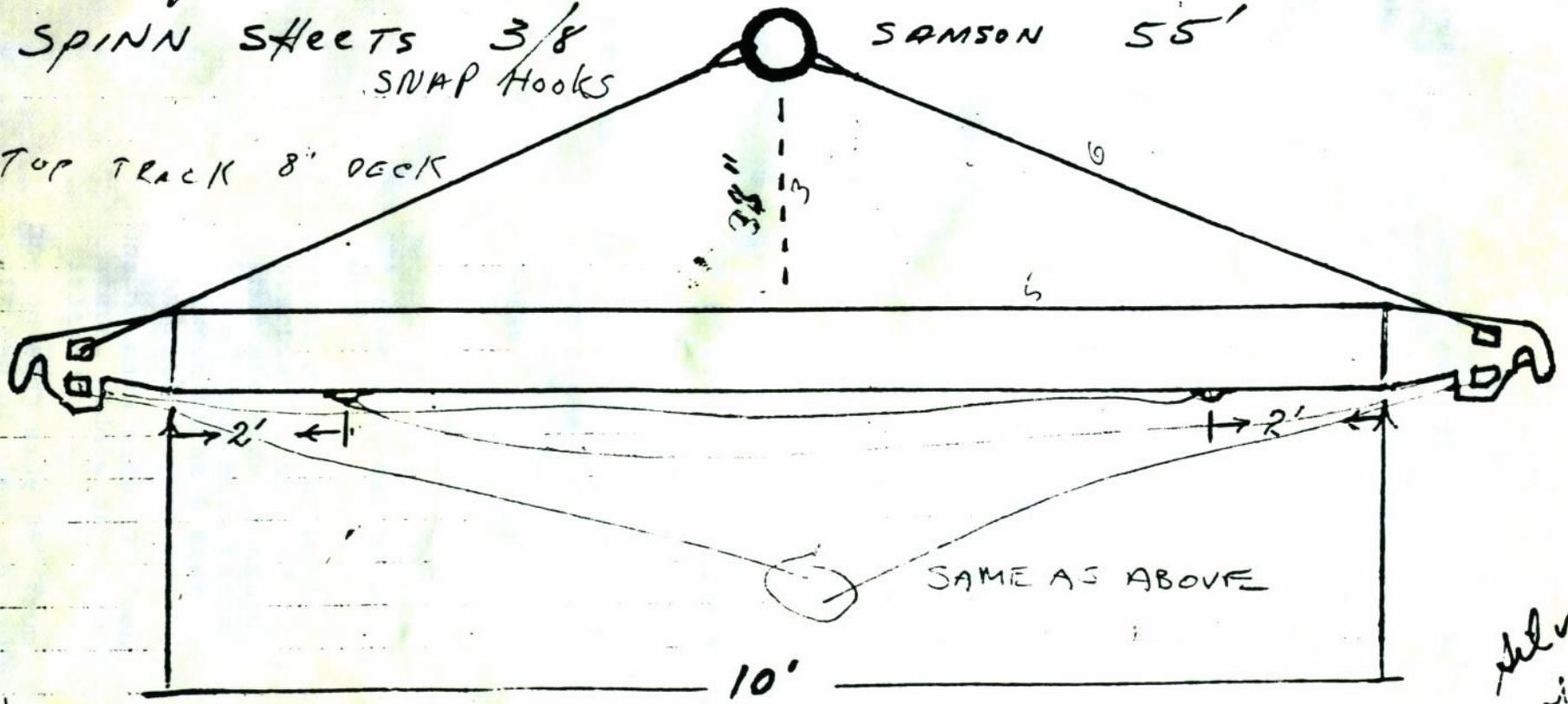
SPINNAKER HALYARD - 75', 5/16 SAMSON 391 #1 SNAP SHACKLE

Top Left 35' 5/16 SAMSON - W/ ~~WC~~ 391

Fore Guy 35' 5/16 " " " " 391 SNAP HOOK

SPINN SHEETS 3/8 SNAP HOOKS SAMSON 55'

TOP TRACK 8" DECK



SAME AS ABOVE

silva
 July 3'

SANTANA 21 MAST REPLACEMENT

The original Santana 21 mast extrusion is no longer available. Broken masts are now being replaced with the extrusion used on the Santana 525. In order to make the changeover, the following parts are required:

- 1 mast extrusion (S 525)
- 1 main halyard sheave box
- 1 mast butt
- 1 mast head
- 1 spreader system
- 2 lower shrouds
- 1 backstay - either standard or split
- 1 mast hinge
- 1 gooseneck

This assembly is available through the W. D. Schock Corporation.

SANTANA 21 SPINNAKER EQUIPMENT LOCATION

Mast

- Spinnaker halyard bail with block 3' from top of mast
- Topping lift block & eye strap 13' 9" from bottom of mast
- Spinnaker pole track 5' 3" from bottom of mast to top of track
- Spinnaker halyard & topping lift cleats One on each side 6" down from center of present main & jib cleats, same angle

Deck

- Foreguy block w/eye strap 57" from bow, center of deck
- Foreguy cleat Install on top of cabin, starboard side - 4" from aft edge of cabin, 4 3/4" from main hatch between hatch & teak handrail
- Spinnaker sheet blocks One on each side 18" from stern, middle of winch island
- Spinnaker sheet cleats One on each side 39" from aft end of winch island cleats, angled 45 degrees

SANTANA 21 OPTIONAL DECK HARDWARE PLACEMENT

1. Jib track & block - One both sides 5" forward of winch island on the inside edge of the non-skid under the window.
2. Jib winch - On top of the island 8" aft of the cabin.
3. Jib cleat - 20½" aft of the cabin (aft of winch).
4. Mainsheet cleat - 21½" from aft end of winch island - port side only.
5. Mainsheet block - 12½" from aft end of winch island - port side only.
6. Stern mooring cleat - 6½" from aft end of island.
7. Lifting points - One on each side of deck outboard of the chainplates on main bulkhead close to gunwale. Also a padeye on the cockpit side of the transom approximately 3" from the sole.
8. Genoa track - On top of the winch island toward the outer edge. The track is 30" long. The forward edge of the track sets 14" from the cabin.
9. Forward mooring cleat - 33" from the bow.

SANTANA 21 REPLACEMENT PARTS

Due to the long period of time that the Santana 21 has been out of production, all custom hardware (the centerboard winch, block, and pivot pin, for example) and all wooden parts (hatches, rudder, etc.) are no longer available. The hardware can be replaced with similar items available through marine hardware stores. The wooden parts can be fabricated at local wood shops, using the original parts as patterns. The mast, boom, and all standing and running rigging can be replaced by the W. D. Schock Corporation. The original S 21 spar is no longer available, but we have found the Santana 525 spar to be a very good substitute. We can also replace the swing keel. A lead time of a minimum of three weeks is required for both the mast and the keel.