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DATE: 11/07/83

SAMPLE CUSTOMER LIST PROGRAMS -- MODULE AR
CUSTOMER QUOTE DAILY REPORT

PAGE: 4

QUOTES FOR Rev. Duane Hauser
Customer Number 005766 Quote 6297 Date 11/07/83 For Boat 22' MacGregor

RADIAL HEAD SPINNAKER SAIL KIT

Sail Quote Number 01 -- Saved to Aggregate File 629701

KIT CONTENTS	ITEM NO.	DESCRIPTION	QTY.	UNIT	PRICE	EXT WEIGHT	EXT PRICE
01)	20201	1 OZ V-30 POLYESTER THREAD	2.00	OZ	\$3.85	0.40 Lbs.	\$7.70
02)	20306	SEAMSTIK 1/4"	2.00	EA	\$3.89	0.20 Lbs.	\$7.78
03)	22113.2	2" 40Z NYLON TAPE WHITE	66.00	FT	\$0.11	1.32 Lbs.	\$7.26
04)	22303	1" NYLON WEBBING	15.00	FT	\$0.22	0.60 Lbs.	\$3.30
05)	25304	#1 D-RING	3.00	EA	\$1.55	0.60 Lbs.	\$4.65
06)	26101	12" SPINNAKER HOOPS	1.00	EA	\$6.00	1.00 Lbs.	\$6.00
07)	29104	#17 HAND SEWING NEEDLE	1.00	EA	\$0.93	0.01 Lbs.	\$0.93
08)	29206	PREWAXED 5-PLY SAILTINE	1.00	EA	\$0.85	0.05 Lbs.	\$0.85
09)	28301	SAILMAKERS LEATHER	1.00	FT	\$2.95	0.30 Lbs.	\$2.95
10)	B5	BERMUDA 5 OZ.	2.00	YD	\$7.15	1.20 Lbs.	\$14.30
11)	36203	SPINNAKER MANUAL	1.00	EA	\$9.95	0.50 Lbs.	\$9.95
12)	29303	3/16" SHOCK CORD	3.00	YD	\$0.30	0.15 Lbs.	\$0.90
13)	CS4	4 OZ. NYLON	1.78	YD	\$4.45	0.71 Lbs.	\$7.92
14)	24103	OLYMPIC NYLON PISTON SNAPS	2.00	EA	\$1.95	0.20 Lbs.	\$3.90
15)	22306	1" POLYPROPYLENE WEBBING	1.33	FT	\$0.14	0.05 Lbs.	\$0.18
16)	C.96	.96 OZ. STABLEKOTE III	40.00	YD	\$6.05	4.00 Lbs.	\$242.00
			TOTALS			11.29 Lbs.	\$320.57
						DELIVERY CHARGES	\$3.96
						TOTAL CHARGES	\$324.53

TOTAL FOR Rev. Duane Hauser

TOTALS 11.29 Lbs. \$324.53

FABRIC FOILS

The Journal of Sailmaking

SAILBOARD SAILS

We at Sailrite get inquiries every day from people who want to build sailboard sails. Most of them are convinced that these sails are a breed apart from traditional sails. In fact, there is nothing new under the sun. Sailboard sails can be constructed using the same rules of thumb that guide the fabrication of standard sails. But there are some features that deserve mention here.

Chief among these is the bendy mast. This mast should be carefully measured, and a proper round should be added to the sail to accommodate that bend. The standard system for measuring mast bend is to suspend the mast from its top and its base. Then hang a weight equal of half the area of the sail in square feet from its center. Stretch a string from the top of the mast to the point where the tack of the sail will be on the mast. Measure deflection at quarter points along this string and add that deflection to the luff round on the sail. This rule of thumb will predict mast bend in "medium" conditions, but it is obviously rather crude, and deviation from it is easily justified.

Draft Placement

Draft placement is difficult in these sails since the allowance for mast bend is often three or four times the round that is added for draft. Any variation in mast bend will destroy the planned location of draft — and a good deal of variation is normal as wind conditions change. Fortunately, as the mast bend increases in stronger winds, the sail becomes flatter. This desirable change is, however, accompanied by a movement of the draft aft which is not at all good in high winds. The use of a downhaul or a Cunningham to nurse the draft back forward is quite awkward on a board boat.

It is, thus, necessary to accept a rather poorly shaped sail most of the time when board boating. As a result, many sailmakers have decided not to devote any extra effort to careful broadseaming. Often there is no broadseaming at all. Some of the new cuts with vertical panels and wedge-shaped panels are practical only because there is no broadseaming.

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COMPUTERS- AGAIN!

Many of you know that we do our own printing at Sailrite. We call the printing side of the business "Ocean Advertising." It is what makes **Fabric Foils** possible.

It also improves the ease with which we can update and revise the many manuals that accompany our kits and the correspondence courses. In an effort to accomplish the same practicality benefits in a different vein, we recently opened a computer store called "Computer Management Systems." Even though we expect the computer store to stand on its own feet just as the printing business has, it is intended to serve a very real function as part of Sailrite.

We expect that sailmakers will make up one of the markets for which we will be putting together hardware and software packages. It is a small market, but we have already spent a good deal of time and effort in the development of programs that we put to use daily at Sailrite.

We have released versions of our Radial Clew and our Pricing Programs to sailmakers on a prototype basis over the past two years. And we are developing more sophisticated packages that will manage the entire sailmaking operation. These packages will include **computer-aided design** with graphic presentations on the monitor that can be rotated and modified right in front of the customer.

They will also interface with the bookkeeping side of the business — a quote can be made, an order written, any purchase orders made up, and inventory modified all with a single machine entry. Cost accounting during production phase can be provided for as well.

All of this is still very much in the prototype stage (translate that "it doesn't work yet"). But the project is underway. If any of you want to get in on the development of the programs and their testing, we would be happy to talk with you. Our "beta" test sites must buy Wang computers and peripherals from us, but there is no charge for the software that we give them for test purposes. A hardware installation will run from \$5,000 to \$10,000 depending upon storage and memory options chosen. ■

FABRIC FOILS



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IN FUTURE ISSUES

The Function of Leech and Foot Lines
Evaluating Sail Shape
The Use of Draft Stripes
Working with Nylon Spinnaker Cloth
Cutting Sailcloth — Tools and Techniques
Sewing Maching Needles and Stitch Quality
Edge Tape Application
Lofing a Tri-Radial Spinnaker
Continuous Support Tapes
Measuring for a Bimini
Estimating Forestay Sag
Lateral Resistance and Center of Effort in Sail Design
Tell Tails and Their Use
The Use of Mast Bend
The Shelf Foot / Loose Foot Mainsail
Designing and Trimming Sails for Fractional Rigs

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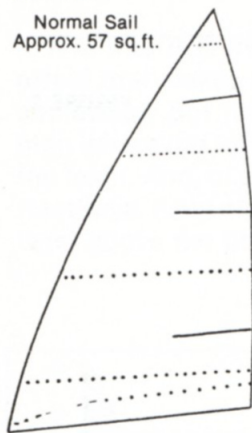
MINIMUM DELIVERY \$3.00 or 25¢/yd., whichever is greater.

Continued from page 3

SAILBOARD SAILS

FIGURE 1

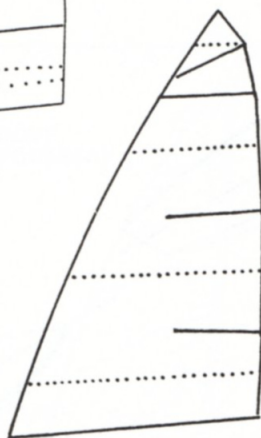
Normal Sail
Approx. 57 sq.ft.



Stormsail
Approx. 40 sq.ft.



Fathead Sail
Approx. 75 sq.ft.



Board boat sails all have nearly the same luff length and maximum girth. The reason is that there has been much standardization in masts and wishbone booms. But there remains a need for sails that will maximize performance in light air or in heavy air. The result has been some unusual sail shapes. The popular "fat head" sails have a normal luff length but use two or three full-length battens near the head to provide a "fat," fan-shaped head. The full-length battens cannot be brought down more than two or three feet from the head since they would be easily broken if the sail were fallen into.

At the other extreme are stormsails which have a full-length sleeve to go over a standard length mast but a short sail luff and no leech roach at all. These sails also usually have a sharply hollowed foot.

Clew height is a crucial factor in board boat performance. It should be determined, in part at least, by the height of the user. Tall people will sail more comfortably with a rather high clew. It should also be noted that clew height can be used to keep the board better balanced. A lower clew will counteract a tendency for the boat to climb to windward.

Board boat sails are an excellent device for training sailmakers. Their shape is not at all fussy and yet they do reward a bit of thought and care in the design process. ■

The Sailmaker's LIBRARY is a seller!

These are simply the best texts on sailmaking available. No effort is made to simplify the subject, yet the instructions are so complete and detailed that almost anyone will find sailmaking well within grasp. Whether the goal is the actual construction of sails or just better understanding of the sailmaker's art, these books make it possible!

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SAILTWIST: What it is and

Twist may not be a frequently used term by sailmakers, but it plays an important role in their design work. All triangular sails develop a twist when they are set. What this means is that a line drawn from the leading edge of the sail to its trailing edge will form much narrower angle to the centerline of the boat down low in the sail than up high. The reason for this is that the unsupported leech falls away in a catenary curve between the clew and the head. The luff, on the other hand, is supported by the mast or stay so that it is a straight line from the tack to the head. Since the girth of the sail gets progressively smaller from the bottom to the top, the leech curve has a greater and greater influence on the angle formed by that line from sail edge to sail edge and the centerline of the boat.

Obviously, the greater the catenary curve in the leech of a triangular sail, the greater the twist will be. In gaff-headed sails, twist is usually extreme because of the tendency for the gaff to sag off to leeward. This is the same catenary curve of the triangular sail, but it is exaggerated because of the increased lever arm that the gaff provides — the leech extends much farther aft than it does in a triangular sail. Gaff-headed schooners, yawls, and ketches can overcome extreme twist by simply sheeting the gaff to the aft mast and bringing it closer to the centerline of the boat.

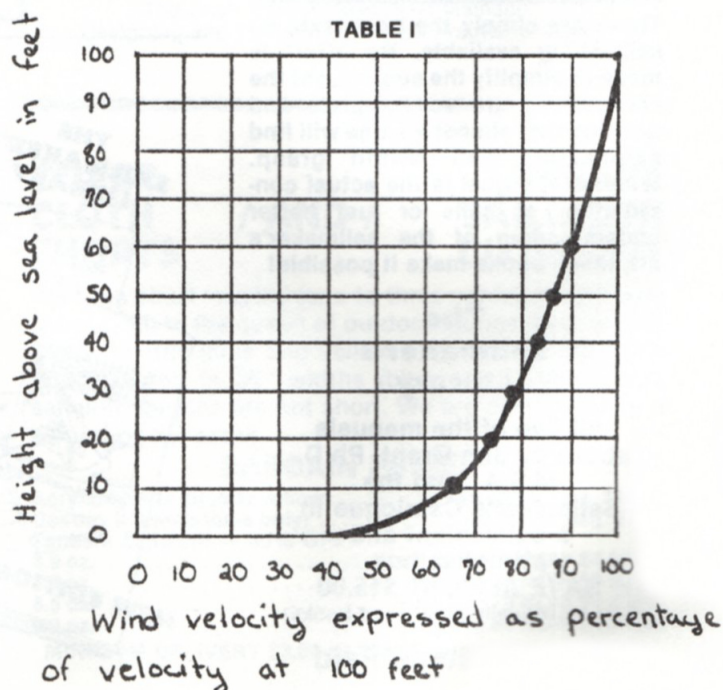
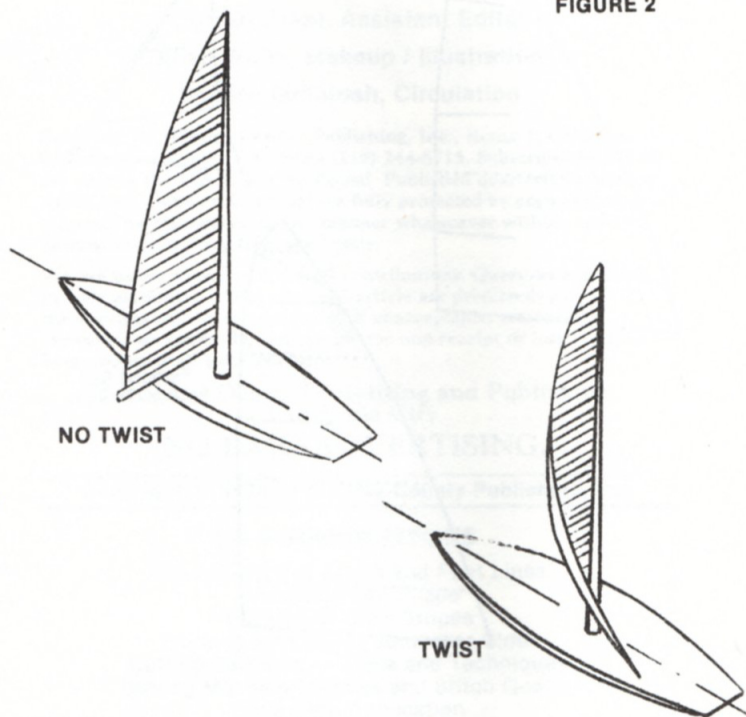
Some Twist Is Desirable

But this can be carried to an extreme as can oversheeting a triangular main to reduce twist. Some twist is highly desirable in all sails. There are two reasons for this.

First, there is a **wind gradient**. That is, the wind tends to be slowed by friction as it moves over a surface of the water. Higher above the water surface, therefore, the wind will move faster than it does down low. As the wind velocity increases, the apparent wind angle to the sail is increased. Thus, there is a need to ease the angle of the sail in order to keep it working most effectively.

Second, when two or more sails are used in line, they influence the airflow over each other. This influence is most significant where the sails are closest together and widest. Thus the lower in the sailplan the closer to the centerline of the boat both a main and a jib should be sheeted in order to be most efficient.

FIGURE 2



how to use it

It is true that the aft sail creates a "bootstrap" effect that makes it possible to ease the headsail somewhat. But this effect is most significant up high where the luff of the headsail is very close to the main. And, of course, mains that are used with fractional head rigs benefit from a good deal of twist above the jibsail.

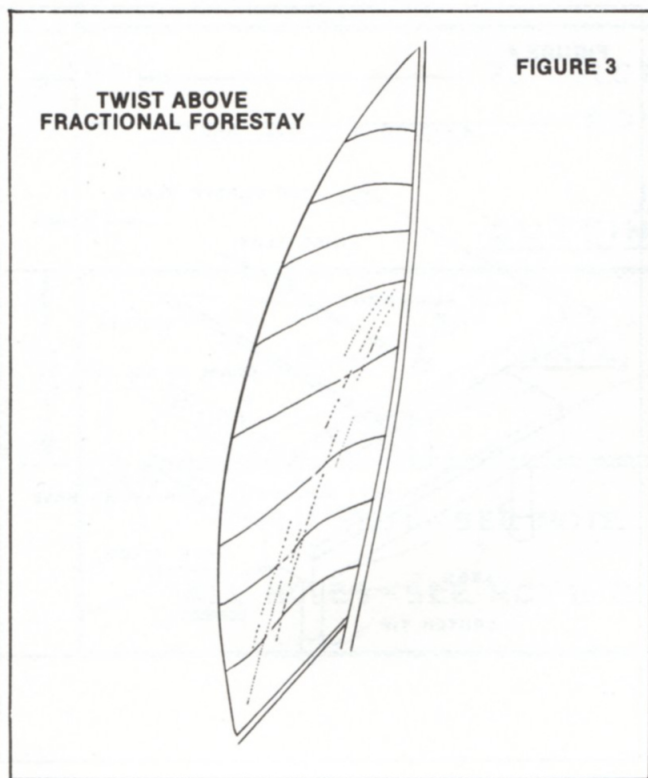


FIGURE 3

How Much Twist Is Proper?

The next question is, then, how much twist is "proper." As so often happens in the pages of **Fabric Foils**, the questions cannot be answered precisely. Too much twist causes just as much loss of performance as too little. And the variables that determine what is proper are too obscure and numerous to list and evaluate. The normal response is to develop an experimental approach to the problem. Try a little more twist and see if it helps. Try a little less and see if it helps.

Twist can be influenced by increasing or reducing tension on the leech of the sail. Moving the fairleads for the jib will accomplish this nicely. Using a traveler on the mainsheet will do the same

thing there. Many use yarn tufts up the leading and trailing edges of the jib to test for smooth airflow over the surface. This practice is useful in jibs, if somewhat crude, but completely unreliable for mains because of turbulence caused by the mast up forward and because of the influence of the jib farther back. In the final analysis, the best sailors depend upon a "feel" for the way the boat is moving rather than these "scientific" tests.

But this does not mean that we cannot develop some rules to be used in the loft when we design the sails that will make the skipper's job easier.

First, we can design our sails so that the twist is variable. Thus, mainsails in fractional rigs can be built with a sharp increase in twist above any headsails. Second, because high aspect ratio sails are likely to require less twist than their low aspect ratio cousins (the normal leech catenary curve will be more influential in giving them twist), this can be allowed for in the design.

Knowing what we want to accomplish, however, and how to actually get it done are two different things. Twist can be effected in the loft by changing the curve of the luff. When we hollow out the luff of a mainsail and then attach it to a straight mast, the twist in that sail will be increased. If the hollow is focused near the forestay intersection in a fractional rig, there will be a sharp break in the twist at that point. In the same way, placing more round in the luff has the opposite effect. The twist in the sail will be reduced.

Note that the curve of the luff can be easily changed in a finished sail by ripping seams from the leech to just behind the luff and putting them back together as a wedge that either puts hollow in the luff or rounds it. This is not broadseaming — the seam need not change the foil shape of the sail at all. If the change is simply the addition of a wedge of cloth or the removal of a wedge, it will have no more effect other than on twist.

The problem of reducing twist in high aspect ratio sails is best met by using a construction technique that reduces leech stretch to a minimum. For some sailmakers this means using fill-oriented cloth (called "mainsail cloth"). For others it means using a warp-oriented cloth and the leech cut. Whichever technique is chosen, it is important to realize why the choice has been made.

Much work remains to be done in this area. Sailmakers have only recently begun to introduce the concept of twist into their design work. But the recent controversy between leech cut and horizontal cut proponents in the sailing magazines is an indicator of the thought that is being given the matter these days. ■

Fixture for Foam Cutting

I have made boat cushions using the closed cell foam, such as Airex or Ensolite. These make excellent cushions. The cost of this material is very high, so much planning is required to keep waste at a minimum. This prevents passing the cost of the waste on to our customers.

This material has many excellent features, however precision cutting is not one of them. I glue the foam to form panels or will add a short strip to best utilize the standard purchased panels. In order to glue or bond these sections together and conceal them somewhat, the pieces must fit squarely and completely. This is where the cutting fixture became an important tool.

We will first discuss the construction of the fixture. Cut the top and base first. The base should be $\frac{3}{4}$ -inch plywood, while the top can be thinner. You may want to make both $\frac{3}{4}$ -inch since you can cut them from a single sheet. Next cut the knife slot. Make the slot only wide enough for the blade to pass freely. If the knife rivet is very wide, make a special notch at the ends to permit insertion. Next cut the two base and leg supports. These are made of standard 2 x 4 lumber. The two holes are drilled completely through and sized to fit the material used for legs. Now glue and nail (or screw) these pieces to the bottom side of the base panel. Do not place any fasteners in the area where the hole is noted on the base section. Set the top clamp plate over the base, aligning the two knife slots very careful and accurately.

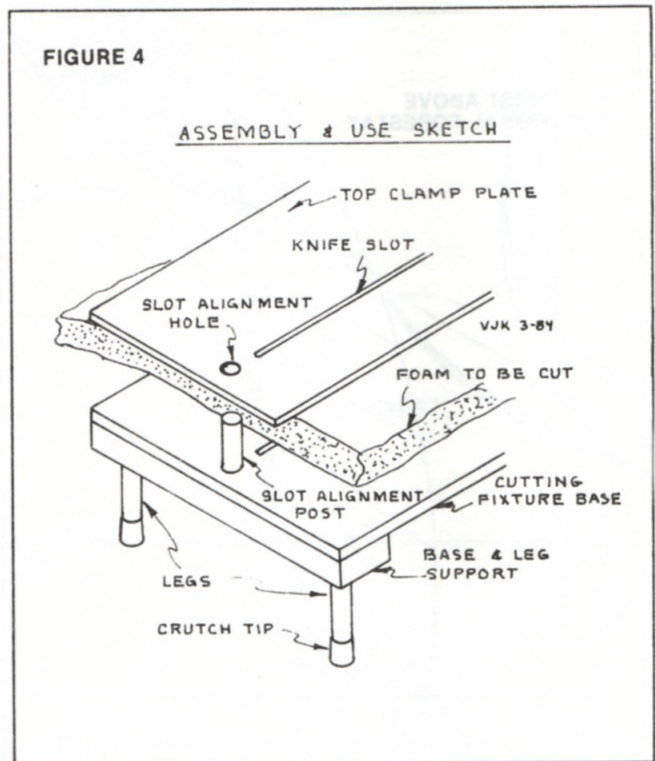
Clamp these two panels together temporarily. (Refer to the assembly and use diagram.) Very carefully drill two holes through both panels and into the base and leg support about $1\frac{1}{4}$ -inch. It is very important that the hole is drilled perpendicular to these panels. The hole should be sized to match the wood dowel or tube used for the alignment post. Remove the clamps and top. Glue the guide posts into the base assembly. When dry, slightly sand or file the two holes in the top plate to allow it to slip easily in place. Add the four round legs with crutch tips. They may be glued in place if desired.

To use, simply remove the top plate, place the foam on the base table, and reinstall the top. Ad-

VIC'S LOFT

Vic Kaminsky

FIGURE 4



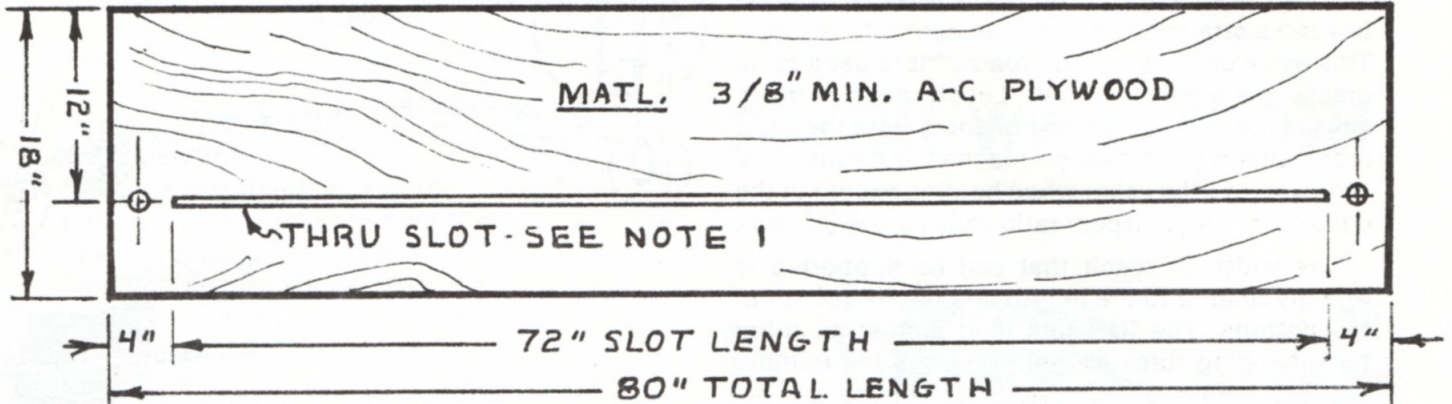
just the foam to see the cut mark in the slot. Place the electric knife through both slots and cut the foam. Carefully wipe or polish the outside of the knife blades with wax paper prior to cutting. With a little care, an extremely straight and square cut can be produced.

To glue the foam parts together, apply contact cement to each surface and allow to dry. (Several coats may be required.) Place the foam panels with the "top" side flat on a table. Now carefully slide the two parts together until they are in contact. Firmly press them together. When the "top" is turned up, you should have a well fitted smooth bond. ■

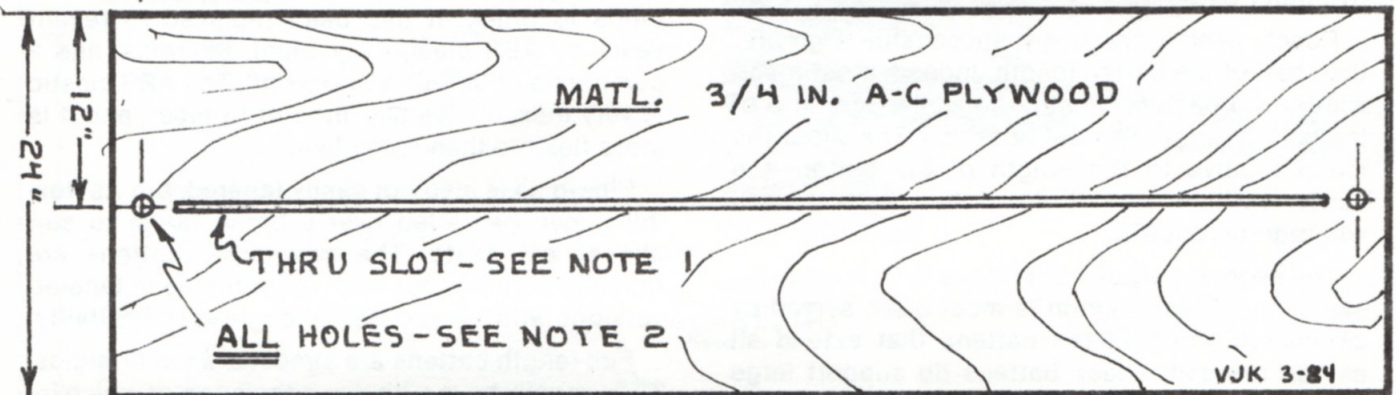
FIGURE 5

FIXTURE for FOAM CUTTING

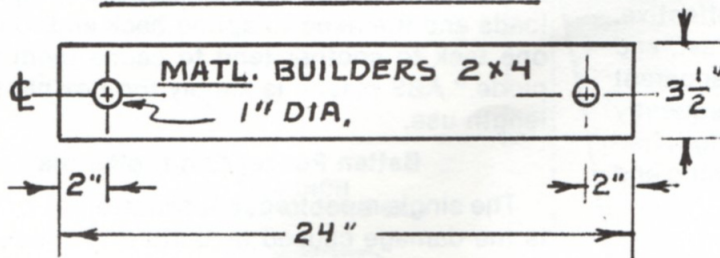
1 EACH - TOP CLAMP PLATE



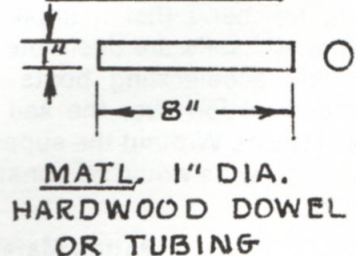
1 EACH CUTTING FIXTURE BASE



2 REQD. BASE & LEG SUPPORT



6 - REQD LEG & GUIDE



NOTE 1. SLOT SHOULD ONLY SLIGHTLY WIDER THAN ELECTRIC KNIFE BLADES

NOTE 2. ALL HOLES IN TOP & BASE DRILLED TOGETHER

Battens and Their Use

Battens have two functions when used in sailmaking. First, they can support cloth that extends beyond a straight line from one corner to another. This extra cloth is called "roach." It is used to increase the area of the sail. Leech roach in mainsails is the most common instance. Here the extra area helps a good deal on reaches and runs. It is, however, of little value when beating except in the case of very high aspect ratio sails (above 3.2 to 1).

The width of roach that can be supported is directly related to the length and the frequency of the battens. The IOR rule (and almost all other handicapping rules as well) restricts the number and the length of battens. Four battens are encouraged, and their lengths are penalized severely if greater than 10% of E plus 12 inches (for the two outer battens) and 12% of E plus 12 inches (for the two inner battens).

Roach widths are rarely successful if greater than half of the batten length. Indeed, most roach widths will be somewhat narrower — one-third of the batten length is most common. The wider the roach relative to the length of the batten, the harder it will be to control and the sooner the sail will require recutting.

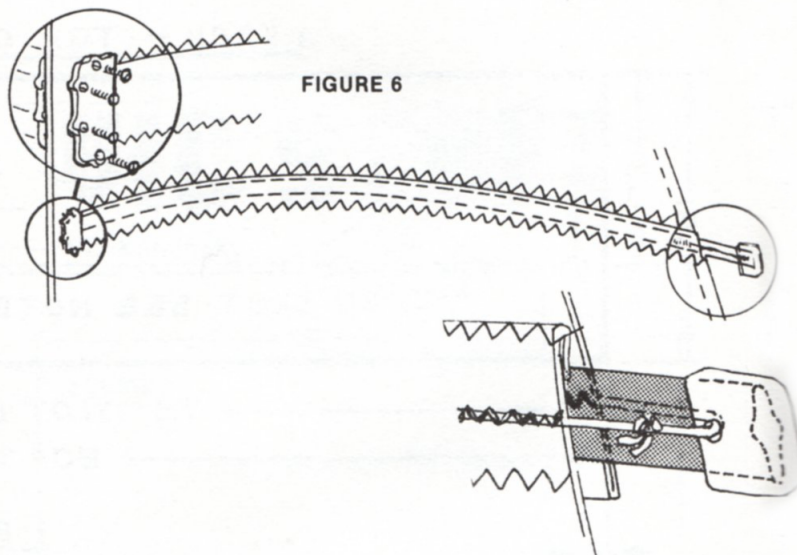
The second purpose of battens is to provide for sail shape. This function is most often served by catamaran and trimaran battens that extend all across the sail. These battens do support large roaches, but their primary function is to shape the sail. To accomplish this, they are usually tied into the sail and compressed. This forces them to bend which, if the batten is shaped, can be carefully controlled to give just the desired foil.

Even if the batten is not shaped (and most are not), the bend that it imparts will be effective. "Shaped" sails are desirable with light, fast, and quickly accelerating boats since the apparent wind direction over the sail changes frequently and rapidly. Without the support of full-length battens, the sails would be constantly collapsing and filling.

Batten Material

The material used will depend, in part at least, upon whether the batten will support roach or will give shape. Even so, all battens must have two characteristics: toughness and flexibility.

Ash is the traditional batten material for roach support. Its disadvantages are that it warps, and it



tends to break. It has been replaced in recent years by ABS plastic (Cycloac), fiberglass, and a composite of fiberglass and wood. The ABS plastic is very inexpensive but difficult to taper, and it is more flexible than many like.

Fiberglass is also not easily tapered, but its flexibility can be varied over a broad range to suit almost any taste. The composite battens are rather expensive, but they are available in tapered versions with many different degrees of flexibility.

Full-length battens are almost always fiberglass. They usually have a rib down their center which increases stiffness and, at the same time, provides a means by which they can be easily shaped — sanding the rib off or reducing its thickness at any point will make the batten bend more readily at that point. Composite battens do not work well in full-length applications because the compression loads and the need to spring back and forth from one tack to another tend to cause them to "explode." ABS plastic is simply too flexible for full-length use.

Batten Pocket End Protectors

The single most frequent cause of repair in sails is the damage caused by battens. To reduce this damage with full-length battens, sailmakers use **batten pocket end protectors** at their front. All of the compression loads are focused in these plastic cups that are riveted or bolted onto the sail over the end of the batten pocket. These protectors help, but they do not prevent the battens from eventually wearing through their pockets.

The short roach-supporting battens are also maintenance problems. No matter how many layers of fabric are used to isolate the battens from the sail, there will eventually be some chafe damage. And, when battens break, they will often cause a tear in the sail.

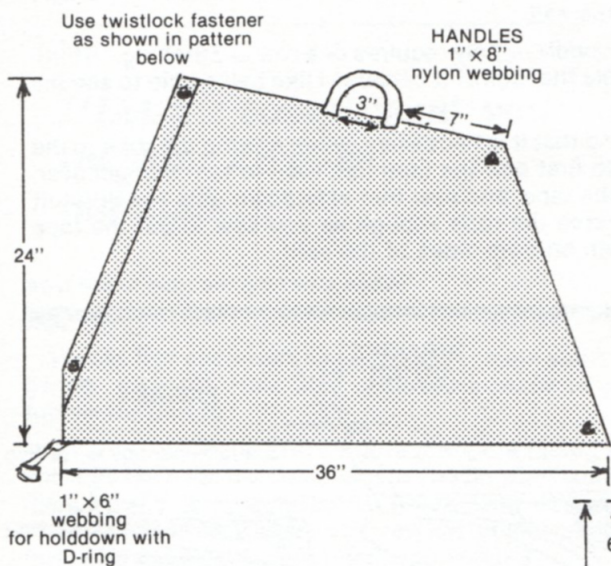
Indeed, maintenance problems have caused

many cruisers to forsake battens. In place of leech roaches, they hollow their sails. The extent of the hollow needed to prevent flutter in the trailing edge of the sail is usually about 1.5 to 2.0% of the length of the leech (that is, the hollow should be that deep at its center). The loss of area will be felt on reaches and runs, but it seldom affects beating performance. ■

Paul Sperry of Grand Terrace, California, has designed a foredeck bag that is easier to build and better looking than the one in our Canvas Worker's Library. The size shown here works well on a Catalina 22. You will want to modify the size for other boats.

THANKS, PAUL!

ON THE WATERFRONT



Use Velcro on the three sides on the inside of the hem. Need 4 1/2 feet.

THIS FOREDECK BAG IS FOR SAILS OF 80 SQ.FT. OF MEDIUM SOFT SAILCLOTH.

ADD 1 1/2 — INCH
FOR HEMS ALL AROUND BAG

HEM

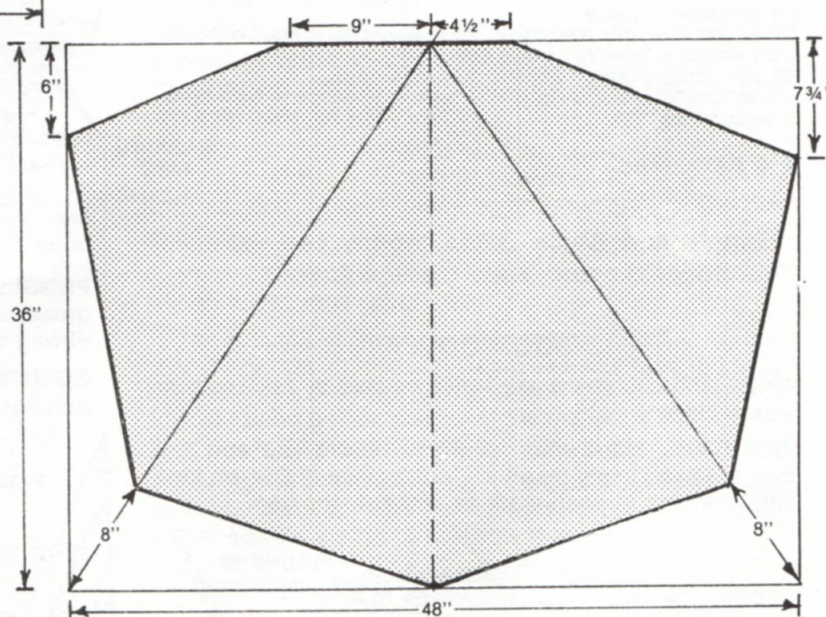
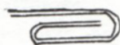


FIGURE 7

Tips worth passing on...

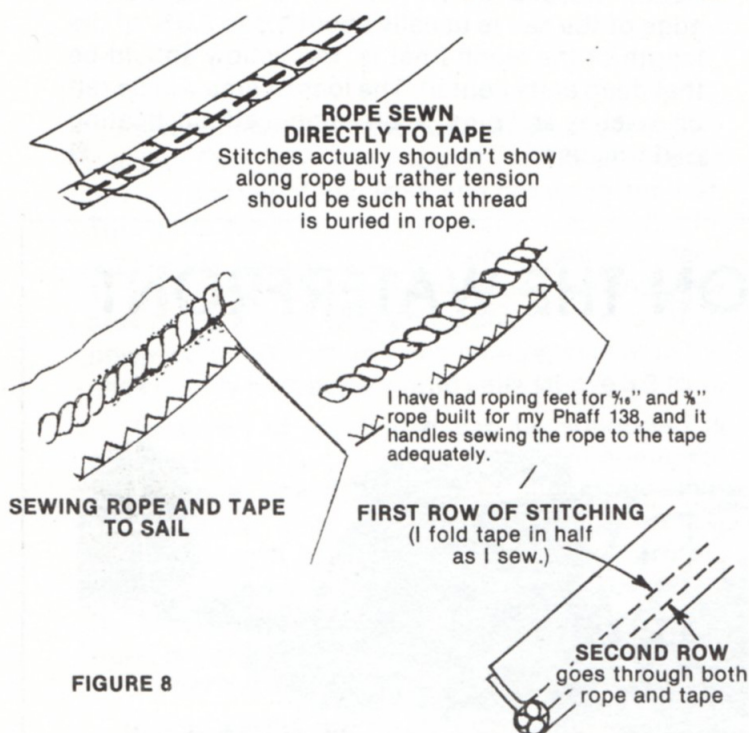


FIGURE 8

Jim,

This is a little trick I came up with while making a hatch cover for a "fussy" customer. He wanted a minimum of fasteners to be used but at the same time wanted the wood protected. The wood trim was only about 1/8-inch thick. In order to get the cover to "hug" the sides of the hatchway entrance without fasteners, I simply put in a normal hem, folded the fabric in half and placed a straight stitch about 1/8" away from and all along the edge. It works great!

- [1] Sew hem in place.
- [2] Folded over, required depth plus approx. 1/8" (max.). Hold flat with masking tape, roll seam flat.
- [3] Sew straight stitch approx. 1/8" from edge.
- [4] Remove tape and unfold. Will have a tendency to hold tightly against surface.

Vic Kaminsky

MASKING TAPE

Carole and Bruce Bates, Bonny Lee Sails, in Thornton, Colorado, send these solutions:

BOOM COVER

PROBLEM: Do you repair holes caused by fasteners or snaps ripping out?

SOLUTION: Mark snap locations before you sew the hems. Then simply insert a 3"-long piece of Dacron tape into the hem at each mark as you sew the hem.

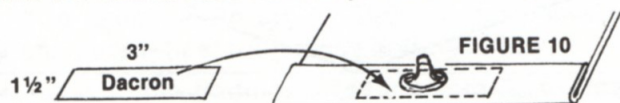


FIGURE 10

Lynne Fabricant, Blyn Sail and Canvas, in Sequim, Washington, writes:

I would be interested in a discussion of rope and tape construction for mainsail luff. I'd like to see rope machine sewn to dacron tape, compared with rope sewn inside tape sleeve. When I have used the rope inside tape method, I like to run a second stitch straight through the tape and rope. My Phaff 138 handles this well. Worthwhile to include in the discussion would be size and type of rope, thread size, and width and weight of tape and their relationship to the sail and boat that they are designed for. I like to use a tape 2 1/2"-4" wide, depending on the sail, and the tape at least one half ounce heavier than the sail. I think I prefer the rope sewn directly to the tape for three reasons.

First, the tape runs through the machine faster than the rope because it is in contact with the feeddogs, causing the rope to be shorter than the tape. On the finished sail this is nice because in light air you can ease the halyard and the rope will put a nice full shape into the sail.

Secondly, it only requires one row of stitching.* Thirdly, I like the look of it because I like being able to see the rope.

I find that it is necessary, when sewing the rope to the sail, to first sew the tape flat, then to turn the sail over, fold the tape, and sew that side down. It is too difficult to stretch the rope enough as you sew to get the tape smooth on both sides of the sail.

*When attaching the rope to the tape.

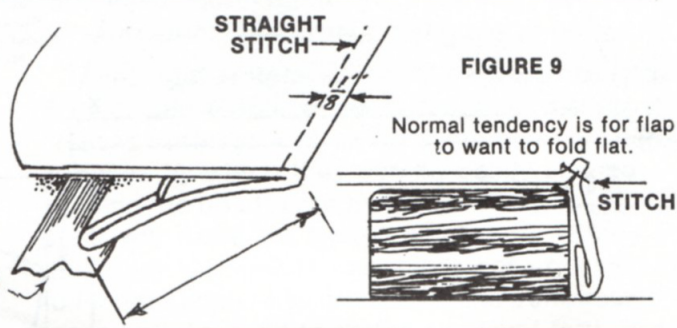


FIGURE 9

TACK PATCH

PROBLEM: Tack patch sometimes interferes with broadseams in order to get patch large enough and strong enough.

SOLUTION: Extra patch with less fabric. Use six triangle patches as shown for a great tack patch.

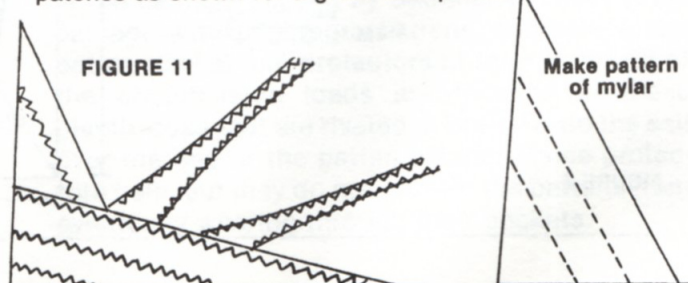


FIGURE 11

LETTERS



Letters continued next page.

"It's kind of like chit chat and discussion with another sailmaker..."

Enclosed is my check for a 3 year subscription. I've enjoyed the info in your publication. It's kind of like chit chat and discussion with another sailmaker — something I don't get to do as often as I'd like. I began my loft here on the Olympic Peninsula in 1977 after having worked for other lofts since '74. There is always so much to learn!

Lynne Fabricant
Sequim, Washington

"Let me compliment you on your excellent manuals..."

Dear Jim,

Please find enclosed the sailplans for main and 130% genoa for SJ21. Have also enclosed a check to cover tuition for Unit III.

Though this is my first venture into pure racing sails and Y.T. cloth, let me complement you on your excellent manuals and at the same time urge you to finish revision of the mainsail edition, as your revised Jibsail and Spinnaker Manuals have been much appreciated.

Also, whilst on that topic, I would like to congratulate both you and the crew of the Fabric Foils publication. As a graduate of Sailwright Academy to the journeyman sailmaker's level I know your journal certainly gives one confidence in tackling the business of sailmaking as an occupation. It is a very professional, informative, and practical publication! Keep it up.

I look forward to your critique of the sailplans submitted.

Yours sincerely,
Ron Johnson
Moses Lake, Washington

Dear Ron,

The Mainsail Manual revision is finally completed. Thanks for your encouragement.

Jim

Jim Grant,

Thought I would drop you a line to let you know how the radial head spinnaker kit worked out on my recent seven-week voyage on Great Slave Lake, Northwest Territories, Canada.

I traveled some 815 miles in my circumnavigation of this fifth largest of the North American Great Lakes and the deepest of them all. Of that distance I used the spinnaker at least 200 miles or approximately 25% of the time, so it was a good investment. Although I had never flown a spinnaker before that, either on a boat as crew or as captain, I had almost no problems. It flew very well and made the downwind sailing far more enjoyable.

At times I actually sailed as close as 65° to the wind. I had not expected to do that! Of the many sets I made I believe I had only two minor glitches that I was able to mend quickly without lowering the spinnaker.

I was singlehanding and found my small 18-foot boat would not hold on an autopilot (Autohelm 1000) if the wind was more than about 5 mph. All controls were rigged to the cockpit though, and I was able to make adjustments under most conditions.

I did get caught in a breeze that came up quickly and which backed from the port to starboard quarter requiring a jibe which I could not accomplish alone. I waited too long trying to play the chute on the "wrong side" and came close to losing it when I tried to bring it in. Scared me a little, but I'll know better next time...I hope!

All in all, I was very happy I chose to build the radial head on your recommendation and though I could have used a storm jib once on the trip, the spinnaker was definitely the best choice of the various sails I wanted to take and the best, I think, of the various spinnakers I could have constructed.

I will be considering publishing the log of my trip sometime in the near future. First I need to find employment again! I hope to get back to sailmaking coursework as soon as I am settled again.

Will keep in touch,
Ted Shoenfelder
Bemidji, Minnesota

Dear Jim,

Please find enclosed check for "Fabric Foils" subscription renewal (3 yrs.).

The articles in these issues are very helpful, as, like many other racing sailors, I want to make sure my sails are state of the art but also that I am not being "sold" a line of "bull" by ads and local sailmakers. Your journal puts the facts clearly forward. Thank you.

During the winter I have built the Sailrite genoa kit you sent me last fall, can hardly wait for my boat to be launched this spring to see how it performs!

Sincerely,
Graham Bryan
Darien, Connecticut

Jim,

Here are some of the shots I mentioned to you, showing some of our different sail combinations: main, 375 ft.²; #3 genoa, 488 ft.²; and spinnaker, 1150 ft.². Others not shown are: #1 genoa (reacher), 676 ft.²; storm jib, 162 ft.²; and trysail, 155 ft.²

The spinnaker sets well in all types of breezes without a pole. Have run it in 25-30K apparent wind, though it's pushing things a bit for 1.23 oz. material. Can carry it with apparent wind up to about 80°.

The main sets better (when the captain pays attention to the halyard tension) than the one picture shows — it takes a bit of cranking, at times, on the winch as we use rope halyards.

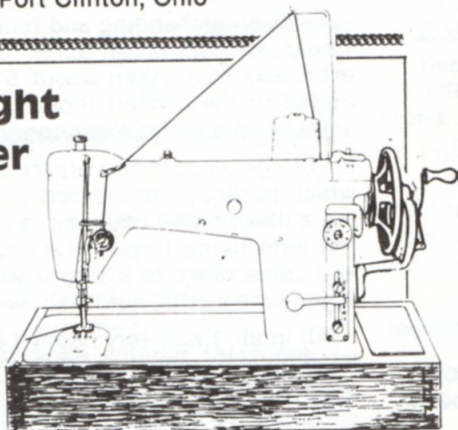
The "squeezer" is a good compliment to handling a spinnaker this size singlehanded. I highly recommend them.

All in all, the courses you present turn out good sails and sailmakers — **big and small!**

Thanks,
John Shugar
Port Clinton, Ohio

The Sailwright Moneymaker

At last, the sewing machine for you! Until now sailmaking and sail repair have been carried out either with small, lightweight, and often underpowered sewing machines designed for home use or with heavy and ridiculously specialized machines intended for volume commercial work.



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Learn Sailmaking at Home

Sailmaking has always been taught through apprenticeship. It is an art, and the teaching of any art requires personal interaction which apprenticeship makes possible. Traditional apprenticeship has some real disadvantages. It requires a full-time commitment over an extended period. Apprentices often complain that they are trained in particular tasks and left to perform just those tasks, and as a result they may not learn the work completely.

The **SAILMAKER'S SERIES** retains all that was good in traditional apprenticeship but does so without the disadvantages. Students work under the direct supervision of Jim Grant.

Grant, who has a Ph.D. in Political Science from the University of Chicago, is recognized as Master of the Sailmaking Art. He founded Sailrite Kits in 1970 to make material and instructions in sailmaking more widely available. His five manuals on sail construction have become classics and are used by sailmakers everywhere. Even the largest, most respected lofts like Ratsey and Lapthorn, Hood, and North make use of the books to train new employees. These books are excellent reference texts for professionals working in a loft yet they are also perfectly suited for individuals building just a few sails for personal use. To teach the art of sailmaking fully, however, there must be an interaction between student and master...and this is the purpose of the **Sailmaker's Series**.

The Series is the first attempt to teach sailmaking in a carefully structured and organized way. This instruction is not compromised by any requirements of production efficiency. Moreover, it is possible for students to move at their own pace through the material. Indeed students can even decide for themselves what level of expertise they wish to achieve. The Series is divided into four units.

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UNIT ONE of the Sailmaker's Series provides a thorough introduction to sailmaking, defining terms, setting forth principles, and developing techniques. Practical skills are also introduced—several scale model sails are constructed during the work. This series of ten lessons will convey a complete knowledge of sail design and construction that will make any skipper a better sailor, laying the groundwork for actual sail construction which begins in Unit Two.

Lesson 1 / The Words and Measures of Sailmaking: An introduction to the unique terminology employed by sailmakers. Organized to make a useful reference tool.

Lesson 2 / Sailmaking Fabrics and Materials: This section starts with a review of sailmaking in the recent past and moves to a detailed consideration of modern sail fabrics and hardware.

Lesson 3 / Sewing Techniques: Covers the principles of sewing machine usage in sailmaking, sewing machine repair and adjustment, as well as hand sewing techniques.

Lesson 4 / Mainsail Design and Construction: A complete study of the mainsail, moving from design considerations, such as aspect ratio and roach width, to construction details, such as boltrope attachment and broadseaming techniques.

Lesson 5 / Jibsail Design and Construction: Structured like Lesson 4 but focused on headsails and the design parameters peculiar to them. Emphasis is on draft needs and draft placement in sails.

Lesson 6 / Spinnaker Design and Construction: Covers bloopers as well as horizontal cut, radial, spherical, star cut, and tri-radial spinnakers. Effects of cloth stretch are analyzed.

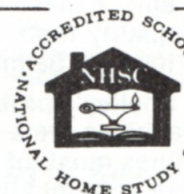
Lesson 7 / Staysail Design and Construction: Here the primary focus is on the theory of sail interaction. Design and construction of six distinct staysail types is considered in the light of this theoretical grounding.

Lesson 8 / Stormsail Design and Construction: Strength and seaworthiness in stormsails are the primary objectives emphasized in Lesson 8.

Lesson 9 / Sail Repair Work: The maintenance of sails from a sailmaker's point of view is presented here.

Lesson 10 / Canvas Work: Sail covers, boat covers, bags, awnings, dodgers, weather cloths, and many other projects, spelling out principles of construction.

Upon completion an Apprentice Sailmaker's Certificate will be awarded.



The United State Department of Education has only one agency listed as a "nationally recognized accrediting agency" for home study schools — the Accrediting Commission of the National Home Study Council. The NHSC's Commission has accredited only one home study sailmaking school in the United States...our **Sailwright Academy**.

Enrollment Agreement for UNIT ONE of the Sailmaker's Series

Please enroll me in Unit One of the Sailmaker's Series. I understand that the entire tuition and materials fee is \$395.00. In addition to ten lesson books, supplies for the construction of model sails, ten assignment papers, and one final examination, this fee includes the following texts:

The Sailrite Sailmaker's Library \$30.00
The Sailrite Sail Repair Kit 35.00
The New Canvas Worker's Library 25.00

Students who own any of the texts listed above should deduct their value from the total cost of Unit One.

I am considering below the payment plan I prefer and will note it on the order form on **PAGE 17** of this issue:

☐ **PLAN A** / I enclose \$100 as a non-refundable registration fee and agree to pay \$29.29 by the tenth day of each month to Sailrite Enterprises for 11 months or until the total payments (including registration) amount to \$395 plus interest (annual interest rate is 18%; total payment if the full 11-month term is used will be \$422.19). Prepayment without charges is permitted and will reduce interest charges by the Rule of 78.

☐ **PLAN B** / I enclose the entire tuition and material fee for Unit One of the Series or \$395.00. Of this amount, I understand that \$100 is a non-refundable enrollment fee.

You may charge the above to American Express, Master Charge, or VISA, by indicating your card number and its expiration date on the order form.



????????????????!!!!

Shelley Halvorson of Honolulu, Hawaii, who owns one of our Sailwright Sailmakers writes:

I am having quite a bad time regulating my bobbin tension in the straight stitch mode using V-92 thread and sewing heavy sail cloth and acrylic canvas. The knot tends to stay underneath unless I tighten my upper tension down **completely**. If I loosen up the bobbin tension, the stitch on the underside comes out loose and uneven.

I own Woodward Canvas Works — as a result, I must be very careful to keep stitch quality high. Except for this one problem, I love my Sailmaker machine!

Shelley's problem is a common one. All sewing machines are a compromise. The best zigzag machines must, of necessity, sacrifice the quality of their straight stitch. I'm afraid that this is the case with our Sailmaker. The shuttle hook in the bottom of the machine throws the stitch from side to side. That gives an excellent zigzag stitch in even the heaviest materials. Unfortunately, when large thread is used, there is a tendency for the bottom stitch to look uneven.

Shelley rightly understands that the solution to the problem is more upper tension on the thread. Unfortunately, even though we add a second, heavier, beehive spring in the upper tension on all our machines, it is sometimes not enough. To overcome this problem, more upper tension is needed. A quick fix is to simply run the thread around the bobbin winder tension disk on the top of the machine. This will usually add enough extra tension to eliminate the "ugly" bottom stitch with all but the heaviest, stiffest thread.

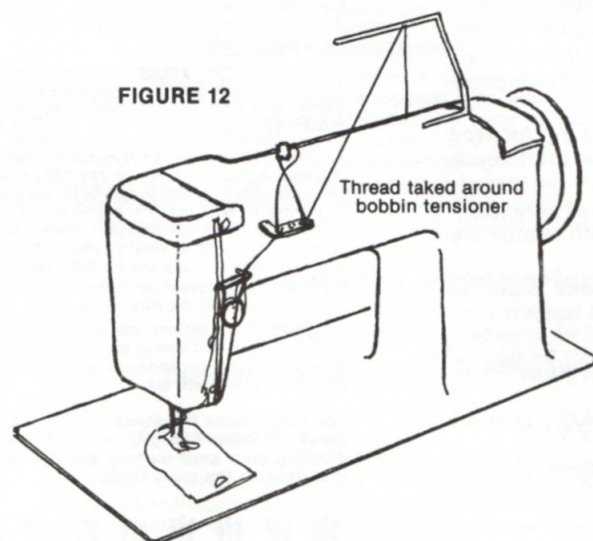


FIGURE 12

Ask Jim Grant

Students in the "Sailmaker's Series" often have a bit of trouble distinguishing between the effect on headsail shape of backstay tension and halyard tension. These two adjustments do not have the same effect. When the backstay is tensioned, the sag in the forestay will be reduced. This decreases the draft in the headsail and moves draft **aft**. When the halyard tension is increased, draft is decreased, but it is moved **forward**. This is an important distinction, and it deserves careful implementation by your crew.

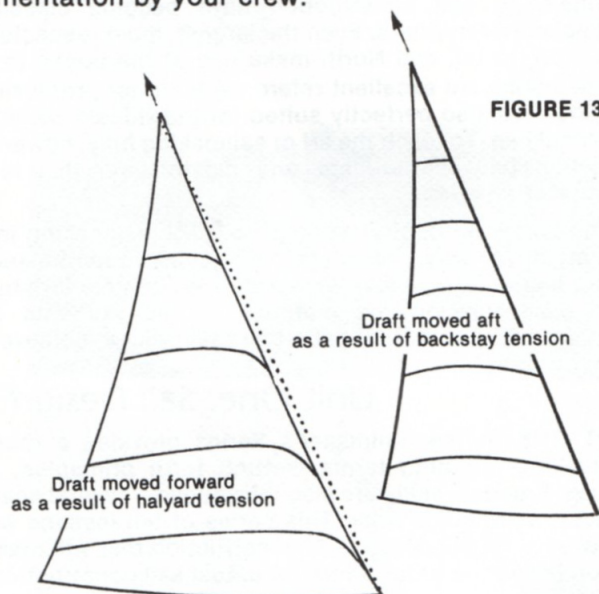


FIGURE 13

We are frequently asked about the proper fabrics for sunshades and cockpit awnings. There are no fabrics especially designed for these applications — the market is too small to justify that. But there are, nevertheless, some good choices available.

Our awning kits include a vinyl-coated Dacron fabric. It is perfectly waterproof and extremely durable. It is also white on top and light blue underneath. This provides a very cool and refreshing shade. Unfortunately the material is rather heavier than it needs to be.

Acrylan cover cloth suffers from the same problem and, in addition, it is very expensive. But it looks good!

Four-ounce nylon is an excellent weight and is reasonably priced, but it does not have the durability in sunlight that is needed nor is it as waterproof as I would like.

We have decided that the vinyl-coated Dacron is the best choice for most people, but it is a good idea to keep the other possibilities in mind.

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The Sail Repair Manual

Written by Jim Grant of Sailrite, this little book has brought sail repair within the reach of thousands of sailors. It is a practical book — intended for those who actually want to do sail repair. There is a full treatment of hand stitching techniques and a section on the use of a home sewing machines. There are even instructions on sewing machine repair and adjustment (including proper timing). Procedures discussed include sail patching, correcting draft and seaming flaws, sail cleaning, and size modifications. All instructions are step-by-step with numerous illustrations. There is simply no better way to achieve the satisfaction which comes from self-reliance on the water!

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A one-ounce tube of the best polyester thread available in the most used weight, V-69 **\$3.85**

Our flat, five-ply prewaxed sailtwine. Looks great and reduces chafe. Four-ounce cone **\$4.69**

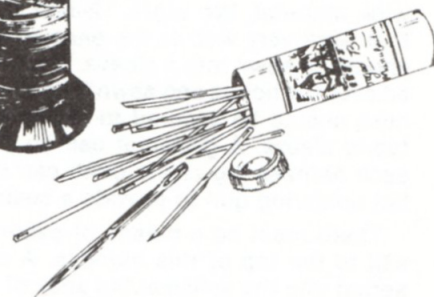
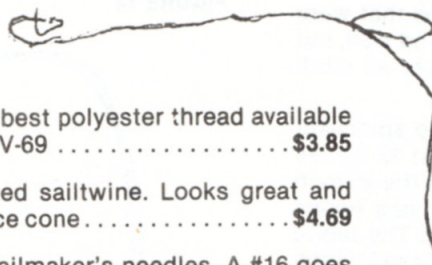
Some triangular shank sailmaker's needles. A #16 goes well with the flat sailtwine. Sizes 18, 17, 15, and 14 also available. The #14 is the largest. **\$.93 each**

Waterproof tube of 20 assorted needles **\$15.79**

The best palm on the market for the price. Adjustable, with a shield for roping. Specify right or left hand. . **\$8.95**

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SPINNAKER SOCKS

There is a good deal of attention given to spinnaker socks on current sailing literature. Many ads suggest that they will make the use of spinnakers (including the reacher/drifter variety) easier and more fun. Indeed, many sailmakers have begun to push "cruising packages" that include either roller furling or socks or both.

There are, of course, disadvantages as well as advantages that follow from the use of all convenience devices on board a boat. The socks, in particular, are prone to cause windage and chafe problems. In addition, they can snarl just when most needed. But they do make shorthanded sailing in light to moderate conditions easier.

If this use suits your needs, by all means consider getting a sock. But don't think you have to buy one at the same time you buy the sail. Indeed, you can make one yourself. Spinnaker socks are very simple devices.

The first one to hit the market was the "Spinnaker Sally." It was a series of Cyclocac plastic hoops that were supported on a rope harness. The Sally worked well, but it was very expensive. More recent socks are all cloth with metal or plastic hoops at their ends.

The best fabric to use is 1.5-ounce ripstop spinnaker cloth. Almost everyone makes the hoops just 12 inches in diameter since that is making the most of the 40-inch wide material. We stock 12-inch spinnaker bag hoops that work very well at the ends of the sock. The fabric should be sewn into a sleeve. Then the ends can be folded over the hoops and sewn in place. A three-legged harness should be secured to the upper hoop through its fabric sleeve. A grommet can be placed in the way of each harness leg or the cloth can simply be cut with a hot soldering gun to provide a sealed hole.

There must be a means of securing the head of the sail to the top of this harness. A clevis pin can be inserted into the splice at the apex of the three legs. Then the halyard is attached to the harness and the whole assembly is raised to the masthead with the sail inside the sock.

One brass ring should be sewn to the hoop at the top and one at the bottom. The upper one is used as a makeshift block for the line that raises and lowers the sock.

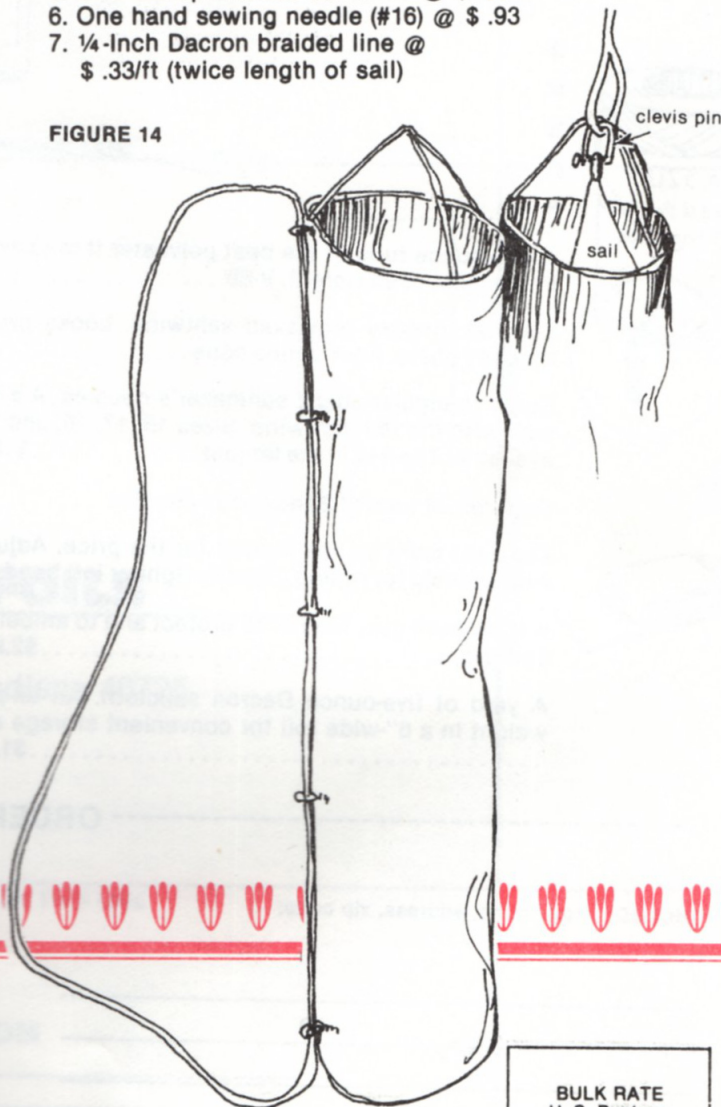
The lower one is just a convenient point for securing the line. Three or four more brass rings can be located along the side of the sock to serve as guides for the line.

This line is nothing more than a continuous lengths of $\frac{1}{4}$ -inch Dacron twice as long as the sock. It is run through the upper ring and the rings along the side of the sock. Then it is tied at the lower ring. And the free leg is tied also at this ring. The free leg can then be used to raise the sock and the captive one to lower it.

A list of materials with prices follows:

1. 1.5-Ounce ripstop nylon @ \$5.00/yd. (length of sail)
2. Two $\frac{3}{8}$ " brass rings and four $\frac{1}{2}$ " brass rings @ \$.87 and \$.52
3. Two 12" stainless steel hoops @ \$6.00
4. 1-Ounce V-46 thread @ \$3.85
5. One tube prewaxed sailtwine @ \$.85
6. One hand sewing needle (#16) @ \$.93
7. $\frac{1}{4}$ -Inch Dacron braided line @ \$.33/ft (twice length of sail)

FIGURE 14



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