

Published by Sailrite Enterprises

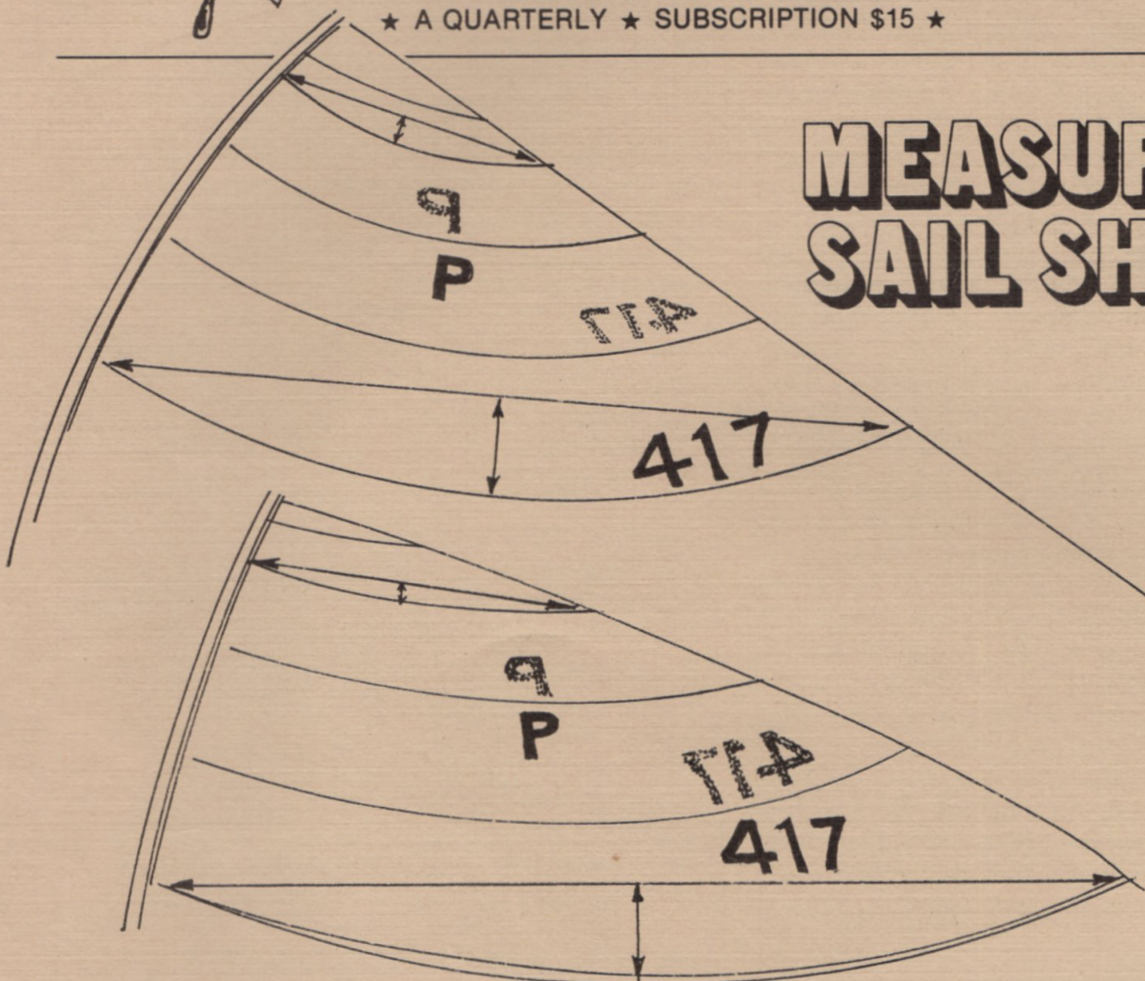
OCTOBER 1984

# FABRIC FOILS

the only publication  
devoted exclusively  
to the art of sailmaking

★ A QUARTERLY ★ SUBSCRIPTION \$15 ★

## MEASURING SAIL SHAPE



Measuring the shape of a sail is an almost insurmountable problem. The surface has, after all, essentially an infinite number of sections through its height. Each one of these sections can have a shape slightly different from that of its neighbor sections.

In addition, the shape is not constant from moment to moment. Sails are hoisted on spars and stays that bend depending upon how the sail is set and upon the conditions of its use. Each change in the shape of the spar or stay will be transmitted to the sail. Moreover, the fabric in the sail itself is continually stretching and shrinking. Sail cloth, although remarkably stable, stretches as much as 5% of its length in normal use. This

Continued on page 3

## ■ In This Issue ■

Measuring Sail Shape .....	1, 3, 4
Editorial .....	2
Use of Draft Stripes .....	4, 5
SAILPLAN DATA .....	5
Working with the Newest Mylar Fabrics .....	6, 7
Tips Worth Passing On.....	7
VIC'S LOFT: Sewing Machine Stand .....	8-11
Learn Sailmaking at Home .....	12
HANDY ORDER FORM .....	13
Letters .....	15
On the Waterfront .....	15
The Advertising Game .....	16



---

## EDITORIAL

---

We finally made the big time! Sailrite was reviewed in the November 1, 1984, issue of **Practical Sailor**. The article was not totally complimentary, but I find it hard to complain very much about the criticism rendered. The fact of the matter is that homemade sails were ridiculed just 14 years ago when I created Sailrite. Even friends in the Marina Del Rey Cal 20 fleet that purchased kits and won races over the prestigious brands questioned whether there was any future for the new company. They reasoned that most people were convinced that sailmaking was a black art. Their own conversion often required witnessing the racing success of competitors. And that kind of conversion was not likely to be a widespread thing.

Connie and I decided to try anyway. If it were not for our inexperience in business, we would have quit in 1974. Instead, I resigned my position at Clairmont Men's College where I had taught political science for four years and decided to make Sailrite a full time career. We opened a small store front just outside of Marina Del Rey in a low-rent area. Most of our business was mail order even then, but without the patronage of the members of the local Cal 20 fleet we would have been very hungry. I think it was only the local success that we enjoyed and the encouragement of our sailing friends that enabled us to continue the business in spite of the rather miserable profits it generated.

By 1977 we bought a rather too large building for Sailrite in Mar Vista, a better neighborhood also bordering on the Marina. Profits were not spectacular, but we were gaining some legitimacy nationally. It was at this point that we created the Sailrite Academy. The courses were developed initially as free sessions offered every Wednesday night in Mar Vista. After eight or so months of free instruction, we felt confident to release the correspondence courses at a price. By 1978 we could begin to depend upon a rather steady cash flow that varied only slightly from season to season.

Two years later we moved back to our hometown in Indiana and brought the business with us. This move set us back about three years in our development. Had it not been for the almost sinful profits we turned in the sale of our California properties, Sailrite would have died on the vine a second time. But we weathered that crisis and came back stronger than ever as a mail order firm not

# FABRIC FOILS



---

OCTOBER 1984 / VOLUME III, NUMBER 1

ISSN 0735-3030

---

Jim Grant, Editor

Connie Grant, Assistant Editor

Allan White, Makeup / Illustration

Shelley McIntosh, Circulation

Published by Whitley County Publishing, Inc., Route 1, Columbia City, Indiana 46725. Telephone (219) 244-6715. Subscriptions \$15.00 per year in the U.S.A., \$25.00 abroad. Published quarterly in January, April, July, October. Contents are fully protected by copyright and must not be reproduced in any manner whatsoever without specific permission in writing from the editor.

We are happy to accept editorial contributions. Query letters which include an outline of the proposed article are preferred. All manuscripts will be reviewed and, if acceptable, returned. However, we cannot be responsible for non-receipt or loss — please keep copies of all materials sent.

Printed at Ocean Advertising and Publishing,  
Columbia City

**NO PAID ADVERTISING.**

---

Copyright © 1984 by Whitley County Publishing, Inc.

---

### IN FUTURE ISSUES

The Function of Leech and Foot Lines  
Evaluating Sail Shape  
Working with Nylon Spinnaker Cloth  
Cutting Sailcloth — Tools and Techniques  
Edge Tape Application  
Lofting a Tri-Radial Spinnaker  
Continuous Support Tapes  
Estimating Forestay Sag  
Lateral Resistance and Center of Effort in Sail Design  
The Use of Mast Bend  
The Shelf Foot / Loose Foot Mainsail  
Designing and Trimming Sails for Fractional Rigs

---

dependent upon any particular regional market at all.

There are still some who sneer at homemade sails, but not very many. A surprising number of our students have become professional sailmakers. Many more just dabble at sailmaking, but they are successful at it! All those who responded to the **Practical Sailor** survey said that their next sail would be homemade.

A measure of respectability is that we are now able to provide services like this journal to the professional community. We also sell our extensive sail plan list and some computer programs. My goal is to help make sail purchasers more aware of their own needs so they can intelligently assess the value of professionals. There is no room for secrecy in sailmaking any more. We can all learn together about this fascinating subject, and all benefit from cooperation.



stretch that does occur will vary greatly depending upon how the loads are oriented to the weave of the fabric. When this fact is coupled with a realization that sails are supported along only one or two of their three or more sides, a further problem emerges. There is extensive sag on the unsupported edges which leads to twist in the sail — even if the shape of a given section at a given time were measured, it would apply only to that section.

Even so, don't despair! The fact of the matter is that such problems need not keep us from measurements that are perfectly adequate for sailmaking purposes. The reason is that sailmaking is, and probably will be for a long time, an art rather than a science. Our construction techniques (the techniques involved in cloth fabrication as well as sailmaking itself) are so subject to variation that it would be foolish to seek a high degree of accuracy when measuring the finished products.

#### Accuracy can be overemphasized

Indeed, one of the first things we all learned in high school physics was that the accuracy of any experiment would be only as reliable as the least accurate measurement involved. When calculating the Btu output of a burner, it does no good to measure the mass of a pail of water to ten decimal points if we can only measure its temperature to within a half degree or so. The accuracy of the experiment will be only as good as the accuracy of the least careful measurement — extra effort on one measurement does not better the accuracy of the outcome unless the same accuracy can be achieved with all measurements.

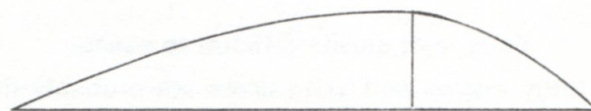
Since it is impossible to measure either the stretch parameters of the cloth in actual use or the variables of sail construction, it is foolish to attempt any degree of accuracy when measuring sail shape — even if it could be shown that such accuracy is possible.

As a result, the articles in the sailing magazines and the ads by sailmakers that suggest the need for careful measurement of sail shape are misguided. Drawings like those on the cover of this issue are fine for instructive purposes, but their accuracy is not helpful in designing better sails. Even the cartography mapping methods of measuring sail shape, while quite accurate as a momentary picture of the sail, do little more than suggest crude differences from sail to sail. In a sense, the more accurate our measurements become, the less relevant they are to the real world of sailing.

## MEASURING SAIL SHAPE



FLAT ENTRY AND EXIT



FLAT ENTRY AND DRAFT FORWARD



FULL ENTRY AND DRAFT AFT

#### Measurement vs. assessment

But while seeking after careful sail measurement may be a misguided pursuit, there is nevertheless a need for some kind of shape analysis on the part of sailmakers. I like to distinguish what we do as shape **assessment**, however, rather than shape **measurement**.

There are essentially five parameters to be considered in assessing sail shape: (1) fullness or draft, (2) draft placement along the sail chord, (3) the entry curve, (4) the exit curve, and (5) sail twist. It is sufficient to estimate each of these roughly since they will not be constant in any case.

Draft is measured as a ratio of the chord of the sail to its maximum depth. A 7:1 draft is full while a 15:1 ratio is flat. Obviously it is not possible to say of any given sail that it is this or that draft. The best we can do is approximate the shape under a given set of conditions and at a given section of the sail. Such approximations will generally be more meaningful if they are relative. That is, one can more easily compare one sail to another than simply declare that a given sail has a given draft. That is why sailmakers often talk in terms of a "full," "flat," or "medium" sail draft. It may not be precise, but it is, nevertheless, meaningful.

Continued on page 4



Continued from page 3

Draft placement is simply the point along the chord at which the maximum depth of the sail is reached. Again, this will vary up and down the sail. It will, in addition, be locally affected by bend along the stay or the mast. So, once again a rough estimate is the best recourse. And this usually means that we speak of draft placement as forward, normal, or aft. Any greater precision is not justified.

#### Entry, exit curves difficult to assess

Entry curves and exit curves are probably the most difficult parameters to describe and assess. Airplane wings are often defined by using a table of offsets. There are usually 10 points which are defined along the chord of the wing. This kind of precision in sailmaking might be theoretically desirable but it is, in practice, futile. It is enough if we can say that the curve is "full" or "flat." A flat curve, of course, approaches a straight line from the edge of the sail to the point of maximum draft, and there will be a rather abrupt break in the sail at that point. A full curve will be quite rounded at the edge of the sail and the center will be rather flat.

Sail twist is determined by stretch along the trailing edge of the sail and by the tension on the clew of the sail. Obviously, any increase in tension is likely to be accompanied by an increase in stretch. Thus it is, once again, difficult to determine twist with any degree of accuracy except at a particular time. But it is possible to compare the twist in any given sail with what is "normal" so long as it is understood that the measurement is extremely crude. I like to use the batten ends as an indicator of twist in a mainsail. Look up at the sail from under the boom. If the battens in the upper part of the sail are parallel with the boom or actually falling to leeward the sail has a good deal of twist. If those battens are hooking back to windward of the boom more than five degrees or so the sail has very little twist. You will notice that mainsheet traveler positioning or vang tension can effect radical changes in twist. Indeed, it is difficult to say of a given sail that it has any particular degree of twist built in since the way it is sheeted is so important. ■

We are near to help you  
CALL US AT 219 244-6715  
or outside Indiana 800-348-2769

## Use Of Draft Stripes

Sail shape is extremely hard for most sailors to evaluate. Draft stripes are one way to make that task easier. The narrow one-inch stripe across the sail clearly outlines the sail's curve. It is much more evident than a row of stitches and, thus, easier to use. I want to go over some of the principles of draft stripe use here.

The stripes themselves are nothing more than adhesive backed insignia material. They do not have to be sewn in place since the adhesive is quite durable and very strong. As a result, they can be quickly installed by anyone. The sail should be as clean as possible, but I find that the stripes stick quite well even on relatively dirty surfaces.

It is a good idea to place the stripes back to back since they will show through the sail. They do not have to run the full width of the sail. Indeed, short stripes are often used at the clews of sails in order to make sheet lead angles more evident. And short stripes could be very useful at the leading and trailing edges of a sail where shape is often most critical.

What about shape? How do you use stripes to judge sail shape? Since we are always looking up at the sail, we get a good view of the cross sectional shape of the sail. The stripes will make that shape evident.

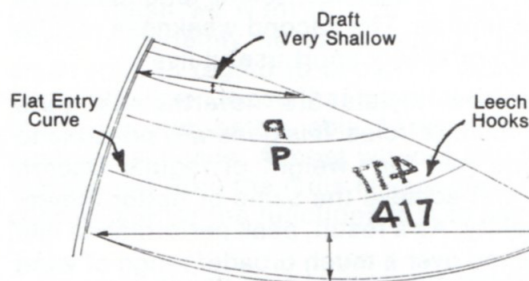
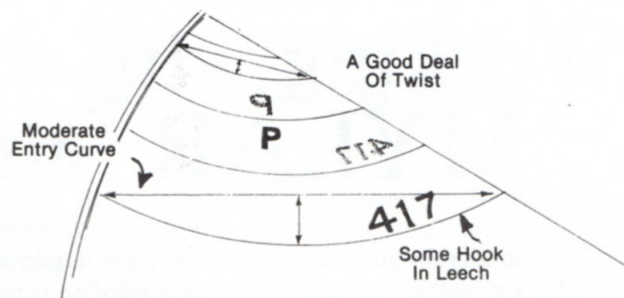
The most important sail shape characteristic is its draft or depth. This is stated in terms of the ratio of sail chord to depth. Thus, a sail with a 1:10 draft would be one foot deep for every 10 feet of its chord or span. It is necessary, of course, to imagine a straight line from one edge of the sail to the other in order to determine its depth. This imaginary line should be parallel to the flow of wind over the sail.

There are two other shape characteristics to look for. First, the curve of the luff is important. A full or sharply rounded leading edge will prove more resistant to stalling and thus be more tolerant of rough, choppy conditions or of an inexperienced helmsman. But a flat entry curve will tend to provide a somewhat faster and closer winded sail if the helmsman is able to "keep the boat in the groove."



The leech is the second important part of the sail to watch. It should be rather flat and smooth. There should be no radical breaks in shape there. But this does not mean that the leech must always have the same shape. In heavy air, the sail can actually be permitted a "soft" leech (one that falls off to leeward) since this tends to "depower" the sail and reduce heeling and weather helm. In light air, on the other hand, the leech can be hooked slightly to weather to increase the "feel" of the helm. The point here is that the shape of the leech can be useful in steering the boat effectively.

One more use of draft stripes is to evaluate the twist of the sail. This requires at least two sets of stripes. I personally feel that more than three is not necessary. See the article in the April 1984 issue of **Fabric Foils** for a detailed discussion of sail twist and how it can be used to improve boat performance.



SAIL	LUFF	FOOT	LEECH	AREA	FT.	MB.	SB	LP	MID-GIRTH	UPPER----	BAT
***** SANTANA 20 *****											
MAIN	24.58	7	24.5	0086.0							
1/4 GIRTH = 0			1/2 GIRTH = 5						3/4 GIRTH = 0		
WORKING JIB	24.66	10	22	0109.8	07.58				8.9		
GENOA	24.66	13.16	23.5	0151.8	08.70				12		
SPINNAKER	24.52	14.67	24.52	0304.0						14.67	/
***** SANTANA 21 *****											
J= 9.75	I= 24.12	B= 7.83	P= 22								
MAIN	22.00	07.83	22.41	0086.1	03.75	4.00				21.39	23.27
WORKING JIB	21.22	12.64	18.85	0113.8	05.75			1.10			
GENOA	23.39	16.13	22.18	0171.5	09.63			1.50			
SPINNAKER	24.71	17.55	24.71	0368.6						17.55	/
***** SANTANA 22 *****											
J= 8.58	I= 25.67	B= 9.85	P= 21.75								
MAIN	21.75	9.83	23.75	0107.1	04.72	4.00					
1/4 GIRTH = 0			1/2 GIRTH = 6.37						3/4 GIRTH = 0		
WORKING JIB	24.58	11.5	22.91	0131.0	08.13						
GENOA	24.89	13.83	23.64	0160.7	08.92			1.50			
SPINNAKER	25.71	15.64	25.71	0337.4						15.64	/
***** SANTANA 23 ***** MADE BY THE SCHO COMPANY (FIRST 4 L)											
J= 8.75	I= 30	B= 16.5	P= 29								
MAIN	29.00	16.50	29.68	0152.2	05.84	4.00					
WORKING JIB	26.40	18.73	23.69	0127.8	08.90			1.10			
GENOA	29.10	13.90	27.80	0191.6	08.94			1.50			
SPINNAKER	29.68	15.75	29.68	0297.4						15.75	/
***** SANTANA 25 *****											
J= 10	I= 31.16	B= 7.83	P= 27								
MAIN	27.00	07.83	26.98	0185.7	03.75	4.00					
WORKING JIB	27.42	12.43	24.36	0156.8	05.75			1.10			
GENOA	30.22	16.04	28.75	0227.1	09.61			1.50			

## SAILPLAN DATA

The only nearly comprehensive listing of any sail plan data.

# \$275

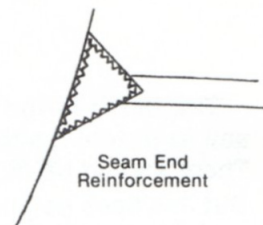
Compiled over the last 14 years by

Jim Grant of Sailrite Enterprises.

Each order is printed out on receipt to ensure all the latest updates. Includes class association limits where appropriate — key boat dimensions otherwise. An indispensable tool for accurate quotes. Also renders recutting for measurement error less likely. An investment that pays for itself within three months.



# Working with the newest MYLAR fabrics



The newest Mylar fabrics are a vast improvement over what was available just two or three years ago. Even so, they remain useful only for the most dedicated racers. Their tear resistance and durability under flog stress is quite limited. As a result of the first weakness, seams tend to require constant attention. The second weakness results in sails with relatively short useful lives.

But the new Mylars are nevertheless quite popular in racing circles. It is generally possible to use a fabric half the weight of regular Dacron cloth and still achieve the same or better dimensional stability. As a result, peak performance can be maintained over a much broader range of wind without time-consuming sail changes.

There is no longer any advantage in the smoothness of Mylar fabrics. The new "Powerknit" Mylar is actually two layers of Mylar sandwiched over a very coarse Dacron scrim. The result is a rather rough surface that crates a good deal of turbulence in air flow. Laminar flow is actually more likely over a Dacron fabric — especially one with a resin coating.

## Constructing the Mylar Sail

If, after weighing these matters carefully, you decide to use the new Mylar in your next sail, the following construction tips will be helpful.

The material comes in 54-inch widths in order to reduce the number of seams. This cuts seam maintenance a bit, but it requires more broadseaming along each seam than would otherwise be necessary. We recommend that seams be broadened one-half inch for each 14 inches of the seam that is affected. These are rather severe broadseams. And, since the fabric is so stable, their effect tends to be rather local. The result is a bit of scalloping in the sail from top to bottom.

To further reduce seam problems, use a double-sided reinforced tape in larger sails to baste each seam and reinforce the stitches. This tape is actually a coarse fabric with adhesive on both sides. It keeps the thread from tearing the Mylar at each needle penetration. In addition, the adhesive sticks so well to the smooth Mylar surface that it increases the structural integrity of the sail in this way also.

Extra rows of stitches along each seam are not really very helpful since the material is so prone to tearing. But it is a good idea to make the seams about twice as wide as normal (from one to two inches) in order to distribute stress well inside the relatively fragile edge of the material. While on the subject of edges, note that the use of the hotknife is not required or even desirable with the new Mylar. The film adhering to both sides of the fabric matrix is more than sufficient to prevent raveling.

## Cover Edges with "Tape"

The edges of the sail are usually covered with a narrow "tape" of nylon or Dacron cloth. The Mylar is so stiff that normal hems are not really very satisfactory — the edge does not fold well without seriously weakening the material. A scissor-cut edge is sometimes preferred by serious racers, but all seam ends should be carefully reinforced with triangles (see figure above) of normal Dacron sailcloth in order to prevent their separation.

All corner patches should also be of regular Dacron. I like to use at least two layers on each side of the Mylar. If all the patches are placed on one side, as we normally do, there is a tendency for the stitches to pull out of the Mylar and release the patches as a unit from the sail.

## Longer Broadseams Required

All of the above has to do with the construction of Mylar sails. What about their design? There is still much to be learned about how to take advantage of the remarkable stability of this material. In general, however, it can be said that the broadseams should be placed so that draft is moved farther forward in the upper part of the sail.

The natural effect of round at the leading edge is to place draft about halfway back in the upper two thirds of the sail. With Dacron sailcloth, that draft can be pulled forward with a little halyard tension since the stretch of the material is relatively influential near the top of the sail where girth diminishes rapidly. Since Mylar is more resistant to stretch, the broadseams have to do more to move draft forward. This is accomplished by making them longer. Instead of running the broadseam curve to the luff two-thirds of the way up, I end it there one-third of the girth away from



the luff. There are no broadseams above this point, but they are all longer than normal from the highest one down to about the half height of the sail.

You can be sure that very little draft adjustment or movement will be possible in a sail made of Mylar. Thus, it is rather more important to get the shape of the sail just the way you want it. This means that recutting is even more rewarding here than it is with Dacron sails. Unfortunately, the double-sided tape makes seam separation quite difficult. But it is not impossible in sails less than a month or so old — so don't procrastinate in your recutting!

Mylar sails are not perfect. They are not even always the best choice for racers. But part of the fun of sailing is experimenting. And Mylar is certainly the latest experimental craze. ■

## *Tips Worth Passing On...*

The following tip was contributed to us by Pete Salsich of Webster Groves, Missouri.

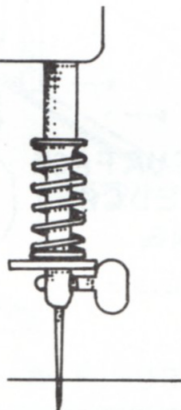
My sewing machine is a Pfaff 284 with full rotary bobbin. It appears to be in excellent adjustment. The only trouble I have been having is sewing multiple layers of cloth. The foot pressure is insufficient for anything over about 20 ounces total weight. The foot pressure on this machine is obtained through a factory assembled part with no provision for field adjustment.

I finally took it to the local Pfaff dealer who told me they could double the pressure but would have to order a new part. He suggested that I could use a compression spring between the foot assembly screw and the case and could see if this would work temporarily.

After a little experimentation I was able to fit a substantial compression spring over the foot shaft so that it bore on the bushing through which it works and, using a washer, support it above the foot assembly screw.

It works perfectly! I sewed 10 pieces of 3.8-ounce and 4" tape, probably almost 40 ounces total. The sample sew ring I am submitting contains this principle.

Thanks for forcing me to figure this out! ■



## *The Advertising Game*

Continued from page 16

The little jibe about a sailcloth that "is a pleasure to handle" sounds nice but certainly has no place in an argument about the advantages of a small loft. The fact is that only the Watts loft and the Hood loft actually manufacture any of the fabric that they use, and these are very large lofts. Everybody else has to buy cloth from the same four or five suppliers. We can specify the particular finish we want (if only in general terms). There is certainly no advantage on the side of small lofts in regard to choice of fabric. But the large lofts, even those that manufacture their own cloth, are not better able to provide for their customers' needs. Almost without fail, the fabric that we get from the mills is very good and quite appropriate for the functions it is to serve.

Do small shops have lower overhead than larger ones? Does this result in lower prices for the customer? The overhead may be lower, but so is the volume work that is done. As volume increases, there are economies of scale that make higher overhead more affordable. For example, it becomes possible to put the loft manager to work behind a desk where he can better sell and plan. His efforts do increase "overhead," but the loft will usually be rewarded with greater efficiency and increased sales if he does this overhead job well. In the same way, the advertising budgets that large lofts depend upon should, if they are well conceived, more than pay their way.

But the fact remains that most small lofts charge less than large ones. In part this may be due to inadequate business records — the smaller lofts are often run more as the owner's hobby than as a business. To the extent that this is the case, such lofts may be unable to provide long term service for their customers. In the final analysis, the size of the loft should have little impact upon the price of the sails.

Finally, can a small loft "afford" to provide more attention and service than a larger one? I can see no intrinsic quality of size that makes this so. Indeed, although it cannot be demonstrated with hard evidence, I expect that there is more profit in terms of percentage of sales at large lofts than there is at small ones. If service is better at a small loft, it is because the personality of the owner or manager is more influential in such an environment. But it may actually be harder for a small loft to provide such service than a large one.

I don't think the sail buying public should be swayed in its assessment of potential suppliers at all on the basis of size. If it has any influence at all, it is secondary and rather minor. ■



**IN THE PREVIOUS ISSUE:** Vic provided useful instructions on putting together a sewing machine stand to handle materials while sewing sails, covers, etc., for sailboats up to about 25 feet. The following article continues the discussion with the construction of trough attachments which support the fabric while it is passing through the machine.

# Sewing Machine STAND

We will now cut and assemble the troughs.

**Trough Side Panels.** Cut four side panels as shown in Figure 9. These should be cut from straight, **smooth** wood. The inside surfaces (grooved side) must be sanded smooth as well as the top edges and ends. This is to prevent snagging any fabric.

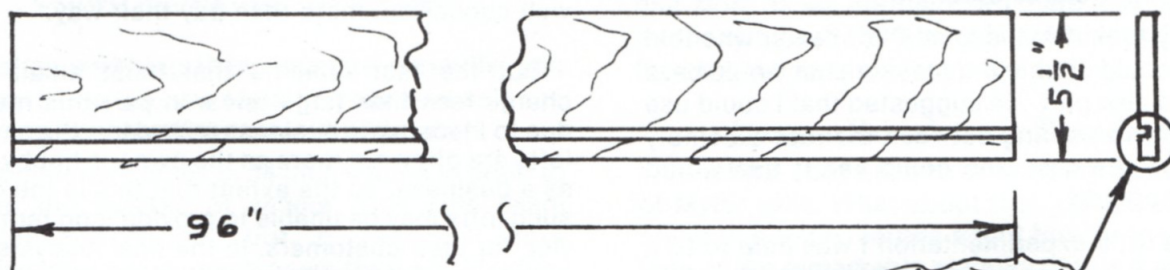
**Trough Braces.** Cut 10 bottom braces as noted in Figure 10.

**Trough Bottom.** Cut two bottom panels of  $\frac{1}{4}$ " Masonite per sketch in Figure 11. These panels should be  $20\frac{1}{2}$ " **maximum** width. To be on the safe side check the total length of the braces, Figure 10, and add to this dimension the depth of both grooves in the sides, Figure 9. The bottom width should be about  $\frac{1}{32}$ -inch less than the dimension. Check to see if this panel fits the groove in the side panels.

## VIC'S LOFT

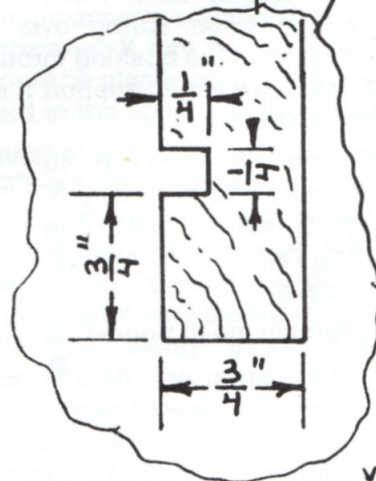
Vic Kaminsky

### SIDE PANEL - S.M. TROUGH



**MATL:** STRAIGHT - CLEAR PINE,  
FIR, SPRUCE, ETC -  
STANDARD 1X6  
4 PCS. REQUIRED

**NOTE:** THOROUGHLY SAND SURFACE  
SHOWN & ROUND TOP EDGES  
TO PREVENT SNAGGING  
FABRIC

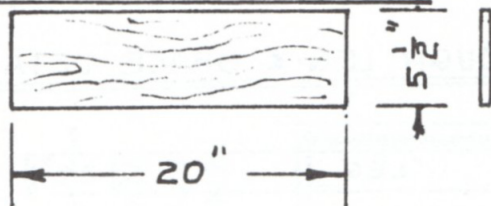


► FIGURE 9

VJK 8-84



## BRACES - S.M. TROUGH

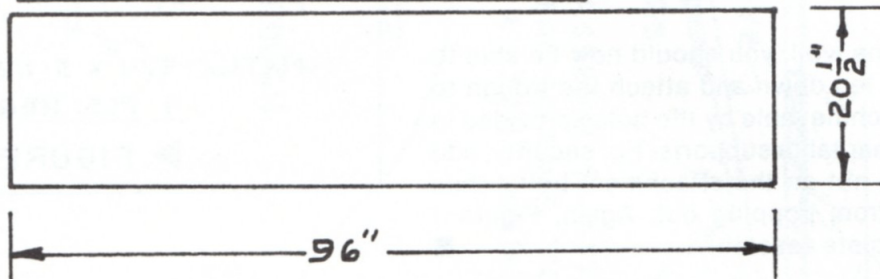


MATL: STD.  $3/4" \times 6"$   
PINE, FIR, ETC.  
10 PCS. REQUIRED

► FIGURE 10

**Trough Assembly.** Study Figures 12 and 15 prior to assembly of the trough. Attach five braces, Figure 10, to one side panel, Figure 9, with glue and two No. 8  $\times 1\frac{1}{2}"$ -long flat-head wood screws in each support. The surface of the brace should be flush with the bottom side of the groove. Place glue in the groove and along the top surface of each brace. Insert the Masonite panel, smooth side up in the groove. Place glue in the groove of the other side panel and along the end of each support. Assemble the "other" side to the trough and insert wood screws as noted above. It may be easier to assemble the trough upside down.

## BOTTOM - S.M. TROUGH

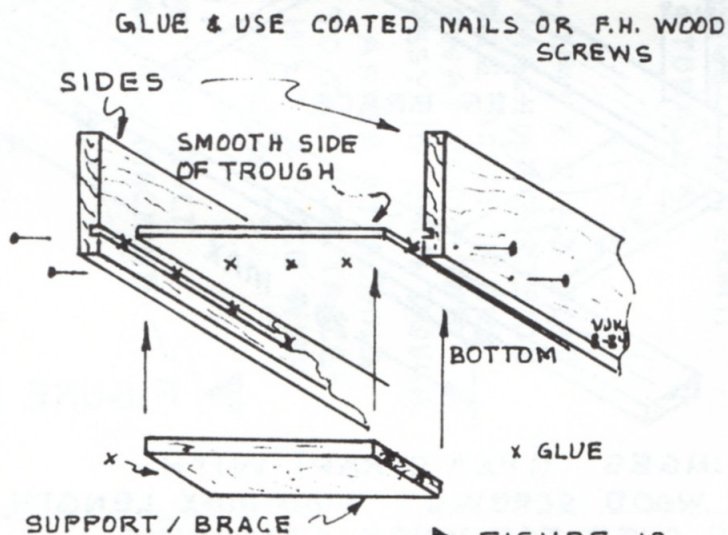


MATL:  $1/4$  MASONITE - SMOOTH ONE  
SIDE - OIL TEMPERED IF  
AVAILABLE - BUT NOT REQUIRED  
2 PCS. REQUIRED.

► FIGURE 11

VJK 8-84

## TROUGH ASSEMBLY DETAILS



► FIGURE 12

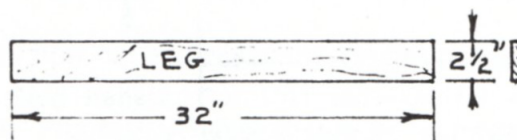


**Trough Leg and Brace Assembly.** Cut four legs and braces as shown in Figure 13. If the legs on the sewing machine table are different in length than those specified, cut these to that new length. Assemble the legs and braces as shown in Figure 14. Use No. 8  $\times$  1 1/4" flat-head wood screws. Attach hinges as shown. Also refer to Figure 15.

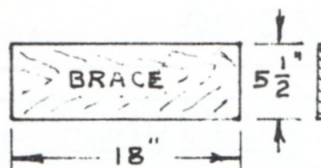
**Final Trough Assembly.** Referring to the lower half of Figure 15, add two 1/4"  $\times$  2 1/2" carriage bolts to one end of each trough assembly, holding in place with a nut or epoxy glue. These must be located accurately and perpendicular to the surface of the trough. Attach the leg assembly to the other end as shown. Note the hinge acts as a stop for the leg assembly. Adding two screw eyes and a shock cord will neatly hold the leg in place. If insufficient tension, place a knot in the shock cord, thus shortening it.

If all has gone well, you should now be able to set the trough leg down and attach the trough to the sewing machine table by the holes provided in the front and rear table supports. For security, add a 1/4-inch wing nut on the attachment bolts, thus preventing it from popping out. Again, Figure 1 notes the complete assembly. ■

### TROUGH LEG & BRACE DETAIL



MATL: 3/4"  $\times$  2-1/2" PINE, FIR, ETC.  
4 PCS. REQUIRED



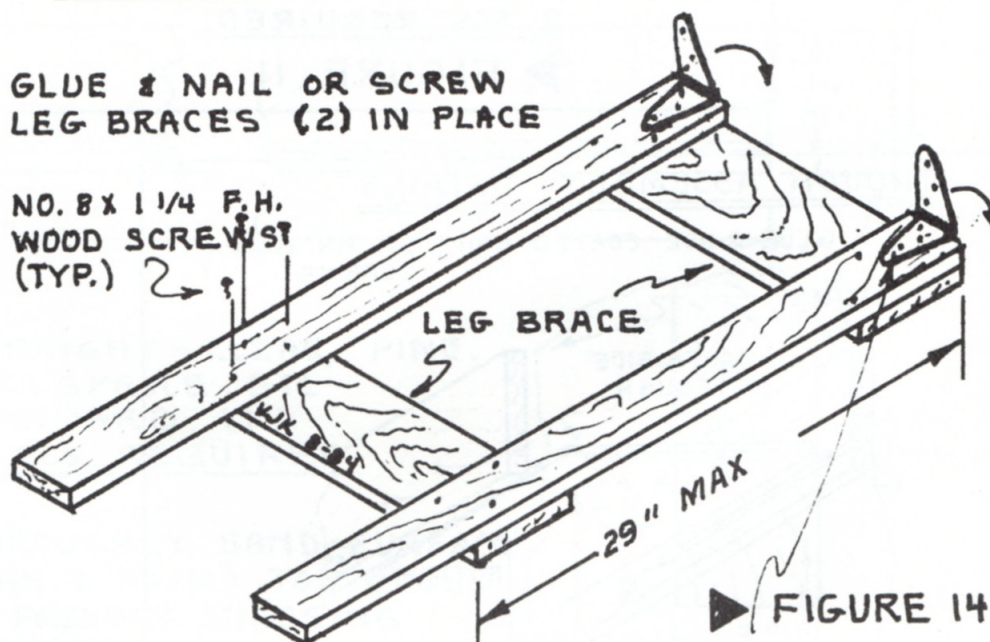
MATL. 3/4"  $\times$  5-1/2" PINE, FIR, ETC.  
4 PCS. REQUIRED

► FIGURE 13

### LEG ASSEMBLY DETAILS - TROUGH

GLUE & NAIL OR SCREW  
LEG BRACES (2) IN PLACE

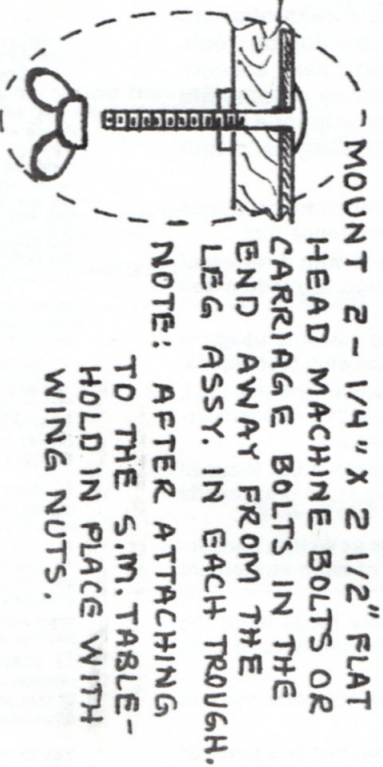
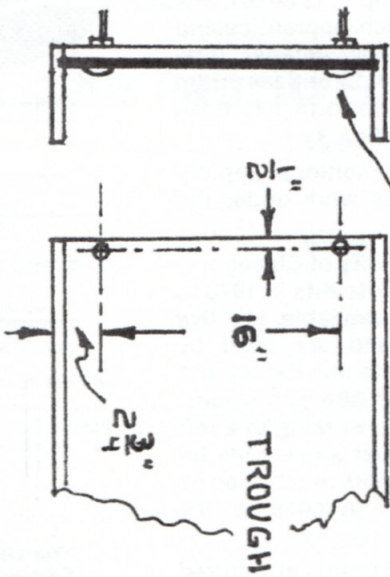
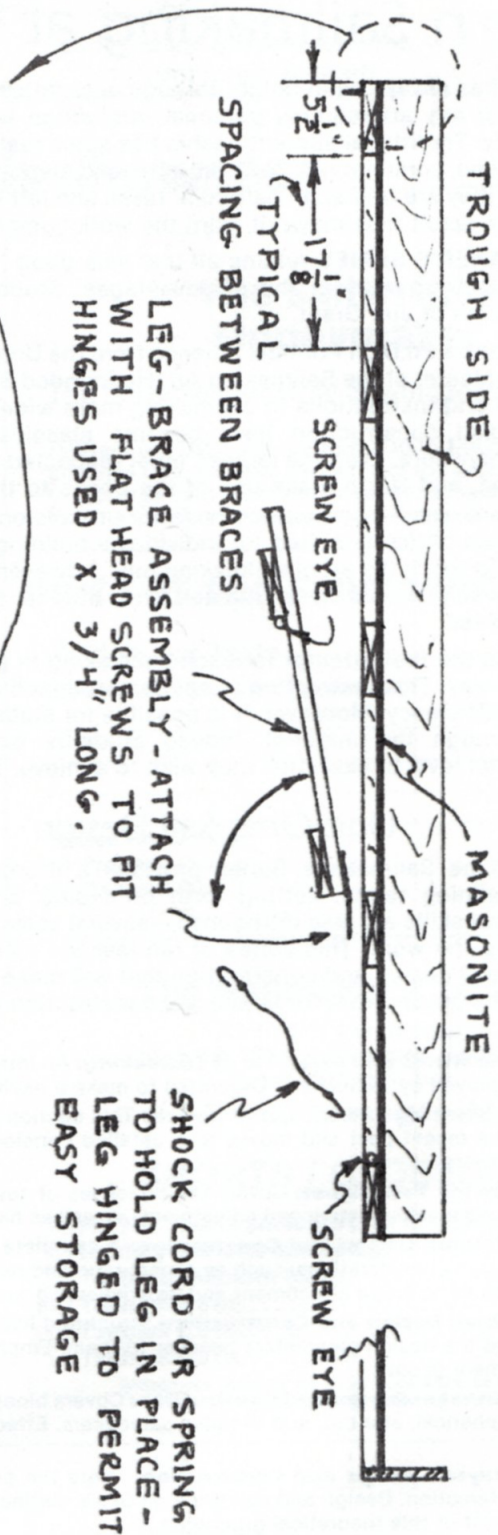
NO. 8  $\times$  1 1/4 F.H.  
WOOD SCREWS  
(TYP.) 2



ATTACH HINGES (1 1/2" STRAP) WITH  
FLAT HEAD WOOD SCREWS - 1 1/4" MAX LENGTH.  
FOLD HINGE OVER TOP WHEN ATTACHING.



# TROUGH BRACE & LEG ASSY. LOCATION      SECTION VIEW



END & TOP VIEW OF TROUGH SHOWING BOLT LOCATION AND BOLT ATTACHMENT DETAIL - THIS END ATTACHES TO THE SEWING MACHINE WHEN THE TROUGHS ARE IN USE.

► FIGURE 15

VJK 8-84



# 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.

## Unit One: Sail Design

**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.





**to conveniently order  
sailmaking supplies and  
instructions . . . for yourself  
or as terrific gifts!**

## FABRIC FOILS

The Sailmaking Quarterly

Subscription to Fabric Foils

- |  |  |
|--|--|
| <input type="checkbox"/> New Subscription                                  | <input type="checkbox"/> 1 Year — \$15.00  |
| <input type="checkbox"/> Renewal (please enclose<br>current mailing label) | <input type="checkbox"/> 2 Years — \$26.00 |
|  | <input type="checkbox"/> 3 Years — \$34.00 |

## The Fabric Foils Showcase

**Back Issues of FABRIC FOILS  
are available!**

### Volume I, No. 1 . . . . . \$5.00

High Speed Sails  
Fine Tuning a Sewing Machine  
A Rule for Broadseaming  
Opinion: Hood's MPG

### Volume I, No. 2 . . . . . \$5.00

From Landscaping to Sailmaking  
Choosing Proper Cloth  
Judging Boat Performance  
Installation of a Sail Window  
Corner Patch Size and Shape  
Catenary Curves  
Opinion: Ultraviolet-Protected Cloth

### Volume I, No. 3 . . . . . \$5.00

Choosing the Proper Cloth Finish  
Computer-Aided Sail Design  
How Much Should a Sail Cost?  
Safe Hotknife Holder  
Cutting Fabric Circles  
Opinion: Leech-Cut Sails

### Volume I, No. 4 . . . . . \$5.00

Two-Ply Sails  
Choosing a Sailmaking Thread  
New Polyknit Mylar/Fabric Composite  
Figuring Width of Sacrificial Cloth

### Volume II, No. 1 . . . . . \$5.00

Industrial Sewing Machine for Sailmakers  
Choosing Cloth Weight  
Thoughts on Stormsails  
Vic's Loft: Stitch Width Gauge  
The Advertising Game: The H.C.S II from Horizon

### Volume II, No. 2 . . . . . \$5.00

Industrial Sewing Machines  
What Makes a Good Cruising Sail?  
Geometry of Sailmaking  
Lofing Battens and Way to Hold Them in Place  
The Advertising Game: The Raudashal Cut

### Volume II, No. 3 . . . . . \$5.00

Sailboard Sails  
Computers — Again!  
Sailtwist: What It Is And How To Use It!  
Fixture for Cutting Closed Cell Foam  
Battens and Their Use  
The Advertising Game: Spinnaker Socks

### Volume II, No. 4 . . . . . \$5.00

Sewing Machine Needles  
Pricing Sails  
Measuring for a Bimini  
Sewing Machine Stand  
Market Positioning

### Attractive

### 3-Ring Binder . . . . . \$4.50

includes complete  
index for Volume I

## The Sailwright Moneymaker

The Portable Industrial Sewing Machine \$995

Delivery (via UPS) will run from \$10 to \$40 depending upon distance from Indiana. We will add the appropriate amount to a charge card purchase or send the machine freight collect if a check or money order is received.

## Unit I of the Sailmaker's Series

Tuition and Texts . . . . . \$395.00

Deduct texts previously purchased:

_____	( )
_____	( )
_____	( )
_____	( )

Please Check One:

- ☐ Payment Plan A  
☐ Payment Plan B

TOTAL \$

## The Sailmaker's Library

All five of the manuals  
plus the 1984 Sailmaker's Catalogue  
in an attractive box.

☐ \$33.00 postage paid

## SHORTS / CLOSEOUTS

- ☐ Acrylic Shorts (Indicate blue or yellow) . . . \$5.00/yd.  
☐ Destiny II Shorts (blue only) . . . . . \$3.85/yd.  
☐ Tanbark Sailcloth 3.9 oz. . . . . \$4.95/yd.  
☐ Tanbark 5.3 oz. . . . . \$6.50/yd.  
☐ Tanbark 6.5 oz. . . . . \$8.25/yd.  
☐ Tanbark 8.3 oz. . . . . \$9.55/yd.

(Minimum Delivery on Closeouts \$3.00 or 25¢/yard,  
whichever is greater.)

Send my order to:

Name . . . . .

\*Street Address . . . . .

City . . . . . State . . . . . Zip . . . . .

\*U.P.S. will not deliver  
to a P. O. Box.

Amount Enclosed \$ \_\_\_\_\_

American Express /  
Mastercharge / VISA No. . . . .

Expiration Date . . . . .

Signature . . . . .



**ADDRESSES**

Whenever possible we ship your order by United Parcel Service (UPS), but we can only direct UPS to a specific address (no P.O. Box or R.F.D. address). There are exceptions, but they do not make the list available. If UPS delivers to your P.O. Box or R.F.D. address, be sure to let us know when you order.

**THE ORDER FORM**

Indicate clearly your name, address, and all necessary information concerning the order. Check and money orders can be enclosed without fear. If a charge card is used, enter card information as request. Then fold the form and seal as directed.

FIRST FOLD ON THIS LINE

THIRD FOLD ON THIS LINE

**FABRIC FOILS**

Route 1  
Columbia City, Indiana 46725

SECOND FOLD ON THIS LINE

FOURTH FOLD ON THIS LINE

**FROM**

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_  
State \_\_\_\_\_ Zip \_\_\_\_\_

TAPE THIS EDGE DOWN



# LETTERS

Dear Jim:

Our Sailwright Sailmaker is doing great! Everyone around the anchorages are now unhappy with their Reeds, etc.

Sincerely,  
D. A. McClead  
Brisbane, Australia

Dear Jim:

Here are the first two lessons of Unit I. I am very impressed with the amount of research and time that you must have spent in assembling all of your material. I thought I could breeze through the course in a few weeks and get started on something new, but your requirements are so thorough that I have had to spend at least 10 to 12 hours on each one.

Your new manuals are great, and I've already picked up some very helpful hints. I am starting Lesson 3 and hope to complete it by next week.

Pete Slasich  
Webster Groves, Missouri

Dear Jim:

The sail is beautiful!

I really enjoyed making it. The kit was quite a learning experience, well worth the price.

Your book is well done and has been most helpful. Thank you for making my first homemade boat complete.

Sincerely,  
Stewart Brown  
Marietta, Georgia

Dear Jim:

It has been about five years since I built one of your spinnaker kits for my Catalina 27. I was super satisfied with the sail since it out performed all the big name lofts' spinnakers.

I have purchased a new boat. I need to build a spinnaker and am thinking about giving a try at a jibsail. Would you send me a new Sailmaker's Catalogue.

Thank you,  
Frank W. Purdy, Jr.  
Manteca, California

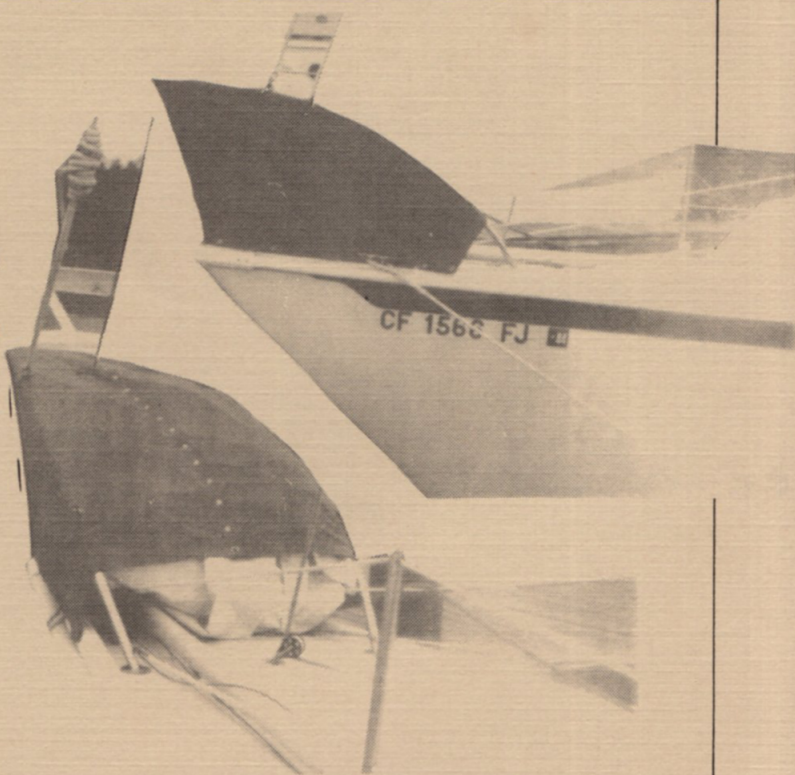
## on the waterfront

Dear Jim:

Another variation of the foredeck bag is shown in these photos.

I am considering a variation on the above for our boat. It would kill two birds by also protecting the teak platform which requires about eight coats of teak oil every year.

Sincerely,  
R. J. Frazier  
Sacramento, California





# The Advertising Game

Sail Spar advertises on page 78 of the October **Sailing** that it is better to buy sails from a small loft like theirs. Four reasons are offered:

1. For racers, they claim an interest that "does not vary with the size of your order."
2. For cruisers, they offer "the same careful design and construction our racing sails get...and a piece of sailcloth that's a pleasure to handle."
3. Their prices are lower because the small shop has less overhead.
4. The small loft gives "attention and service a big loft simply can't afford to give."

Obviously, it is not possible to generalize that all small lofts are always "better" than all large lofts, and I am sure that the copywriter for Sail Spar did not mean to suggest that. The ad is, instead, suggesting that one is likely, just because of characteristics often linked to size, to get better service from a small loft. This is an interesting suggestion. It certainly deserves our attention. Let's consider each of the four points in turn.

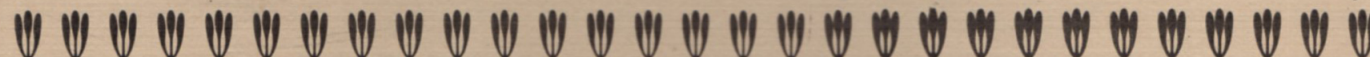
Is one likely to get a more consistent level of attention from a small loft regardless of the size of his order? Perhaps. Certainly it is likely that one will be working with the owner or, at least, the manager of a small loft. Larger lofts will have employees that handle the bulk of their customer relations work. Only relatively large orders will draw the attention of the senior people in the organization. If the man in charge of a small loft is good, he should be very helpful.

Unfortunately (and I speak from personal experience here) the manager of the small loft is often wearing so many hats that he cannot give proper attention to any one of them. Larger lofts can afford to designate specific tasks to individual employees who often perform their functions quite well. I have several friends whose primary responsibility with a large loft is to crew with racing customers on boats of all sizes (hardly a "job" at all — but the pay is lousy). In the final analysis, the size of the loft will probably not have much bearing on the care one can expect to receive. More important is management policy, the current volume of work on schedule at the loft, the capability of individual employees and many other variables entirely unrelated to size.

What about the care that is taken in the design and construction of cruising sails? I am not convinced that mere size has any impact upon this matter at all. No loft can afford to take shortcuts in design or construction without offering other incentives such as low price to induce customers to buy. It is true that many of the large lofts use racing success in their advertising. And the advantages of good cruising sails are not so easily demonstrated. But most large lofts, especially in recent years, have come to realize that the cruising market is larger than the racing one. It is probably safe to say that more attention is given cruising sails by all lofts these days than was the case five or ten years ago — it is required by the current market.

16 / October 1984 / FF

Continued on page 7



## FABRIC FOILS

Route 1  
Columbia City, Indiana 46725



BULK RATE  
U. S. Postage  
PAID  
Columbia City, IN  
Permit No. 238

**NO PAID ADVERTISING**