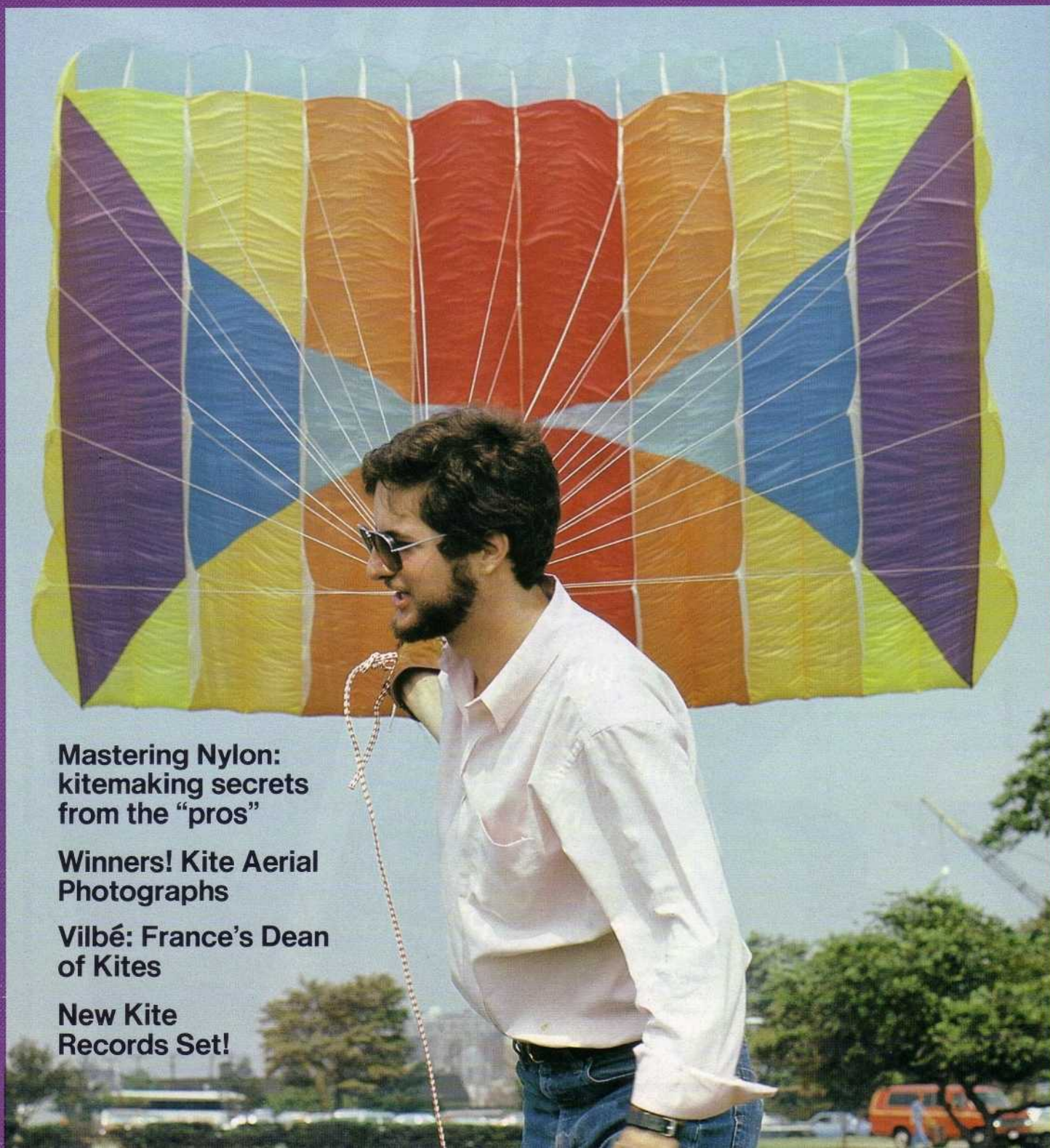


KiteLines

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SUMMER-
FALL
1981

quarterly journal of the worldwide kite community



Mastering Nylon:
kitemaking secrets
from the "pros"

**Winners! Kite Aerial
Photographs**

**Vilbé: France's Dean
of Kites**

**New Kite
Records Set!**

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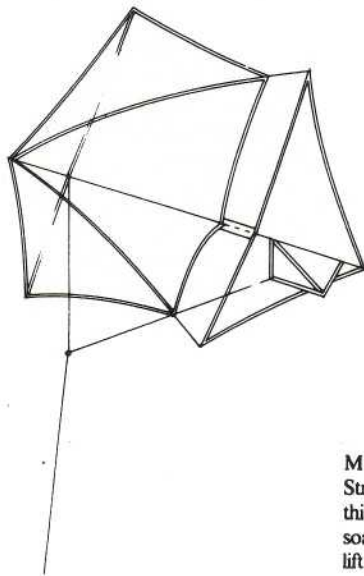
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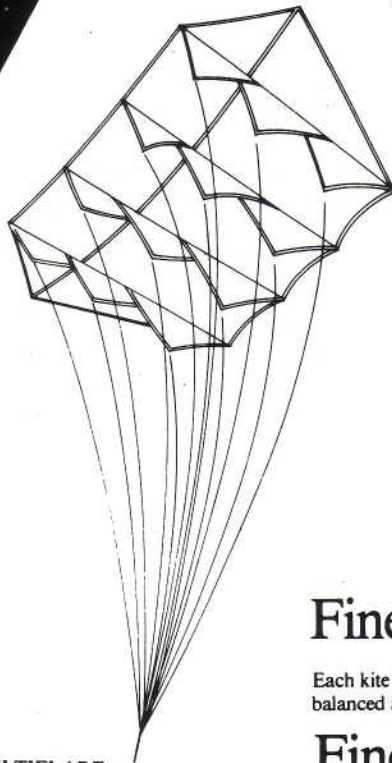
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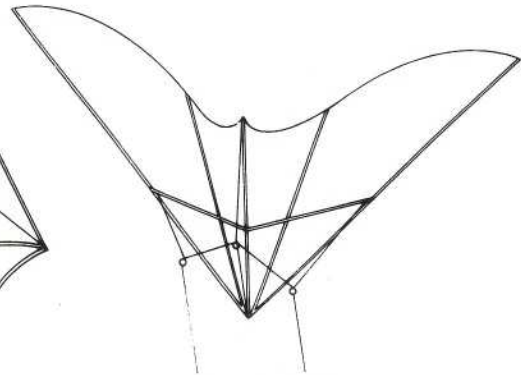
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and with all of them and maintains an
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Cover

Gray Marshall's strikingly pieced Parafoil gives fresh artistry to
the great Jalbert Parafoil design. The scene is Fort McHenry National
Monument and Historic Shrine, Baltimore, a location favored for
weekend flying by members of the Maryland Kite Society.
The open spaces next to the harbor water offer good winds at
almost any time. (See more about Gray and his father Curtis
Marshall on pages 33 to 35.)
Photograph by Theodore L. Manekin.

Letter from the Editor

This letter might be called *Travels of the Editor Continued*. It was a full summer, highlighted by the Maryland Kite Society's kite retreat in July at Harpers Ferry, West Virginia. It was just for us kitefliers, that was the idea—to get out of town and share kite inspirations. My husband Mel had suggested it to the Society and with help from co-organizers Arnold Simon and Carolyn Staples, it was an event for the memory books.

All the elements were favorable: sunny weather, magnificent scenery, good food and—most of all—wonderful people.

Hilltop House in historic Harpers Ferry has a breathtaking view overlooking the confluence of the Shenandoah and Potomac Rivers. You can, in fact, fly a kite from the promontory in front of the hotel, if you wish, but Bolivar Heights Park was scouted as the spot for the real flying on Sunday. Friday and Saturday were nonstop indoor kitemaking and kite talking sessions. We came up only occasionally for air—and food.

A word about that. Dixie Kilham's old stone hotel is well-known for its big dining room with long tables and groaning board with home-style food—just about as your Aunt Mabel might have done it. Not a weekend for dieters!

An adjacent building ("the lodge") had just been remodeled. There we held our sessions, at all hours and in complete privacy, without interfering with the hotel.

Friday night found everyone (about 25 people) staying up late, talking and building kites. Bevan Brown helped his sister-in-law make a beautiful impromptu butterfly while Ellen Rubenstein showed a group how she makes her finely balanced tissue Eddys in rich colors. Some of the enthusiasts were up past 2 a.m. But 8:30 was breakfast and, sleepless or not, everyone was up to hear Tal and Dorothy Streeter talk about the Japanese classic kite, the Sanjo rokkaku. Each of us made our own, carefully following the traditional methods, although dowels were used in place of bamboo.

In the afternoon, Pete Ianuzzi gave a demonstration of knot-making. A number of knots were added by listeners. This was typical of the retreat, that no "authorities" held court, that speakers were scheduled only in order to give a slight framework around which ideas could freely play. I was next and I was joined by Red Braswell and the Streeters with examples

of paperfold kites. Mel gave a rousing speech on kite "training," full of practical advice and comments on the group dynamics of flying kite trains.

As time ran out, Bob Price's talk on his hollow-spar system for box kites was postponed till the next morning. Likewise, voluble Bill Tyrrell, prepared to fill in if necessary, hardly spoke a word. (Bill's on tap for the *next* retreat.) A wordless exemplar, Bill Bigge started and finished one of his Janus kites during the weekend.

Clif Bokman, a sparkling 75-year-old, told us all how to make the "barn door" three-stick kite that he had learned from his grandfather in 1914. On Sunday morning, everyone made one, hoping Mel's notion that they could be flown in train would be realized.

There was a bit of unwanted excitement Sunday when Bill Rutiser, stepping backwards while trying out a kite on the



Our first try on the Bokman barn door train.

hilltop, fell and broke his wrist. He was taken to the hospital immediately to have the break set. Bill's good humor came out in his later comment: "I was conducting an empirical experiment in kite safety."

Saturday evening was picture-show time and slides came out for viewing along with a color film, "Great Kites," from the Malaysian embassy. I had arranged, after much phoning and two letters, to obtain use of this scarce, scratched print, and Brooks Leffler made a special delivery run to get it to us. The film shows the making of intricate, cut-tissue layered Wau Bulan kites of Malaysia. It also shows the regional competitions for angle and duration of flight, in which a coconut shell dropping in a bucket of water is the "timer." We all loved this film so much we ran it a second time.

Sunday afternoon's light winds gave us hope of lofting a Bokman barn door train

at Bolivar Heights. It was a busy, eager social scene, but the kites didn't fly at first. By retying them at longer intervals, the fliers finally saw the train happen—and happen high. Meantime, another little bird train of Mel's went up and down on its own over the soft meadow grass and a variety of fine kites took turns in the sky, including a very large Streeter rokkaku in red nylon. The backdrop of purple mountains at Bolivar made all the kites lovelier. One by one, the friends started to leave. It was all one could stand to say goodbye.

Afterwards, the "high" lingered on, the comments kept coming back. Tal Streeter said, "Not many people see their dreams in daylight." Len Conover said he felt "just like a kid again—and being allowed to throw paper airplanes in class! Can't wait till the next one."

Valerie

P.S. to subscribers: If you were alert, you may have noticed a small change on your mailing label. It now shows the *volume and issue number* of the last copy in your *Kite Lines* subscription term. You can check this against the current issue number to learn your status. For example, this issue is Volume 4, Number 1, as printed at the top of the Contents page. If your label says the same, this is the last issue in your term and you are reminded to renew. (Of course, we send you notice of renewal time, too.) We think this little change will be helpful for everyone.

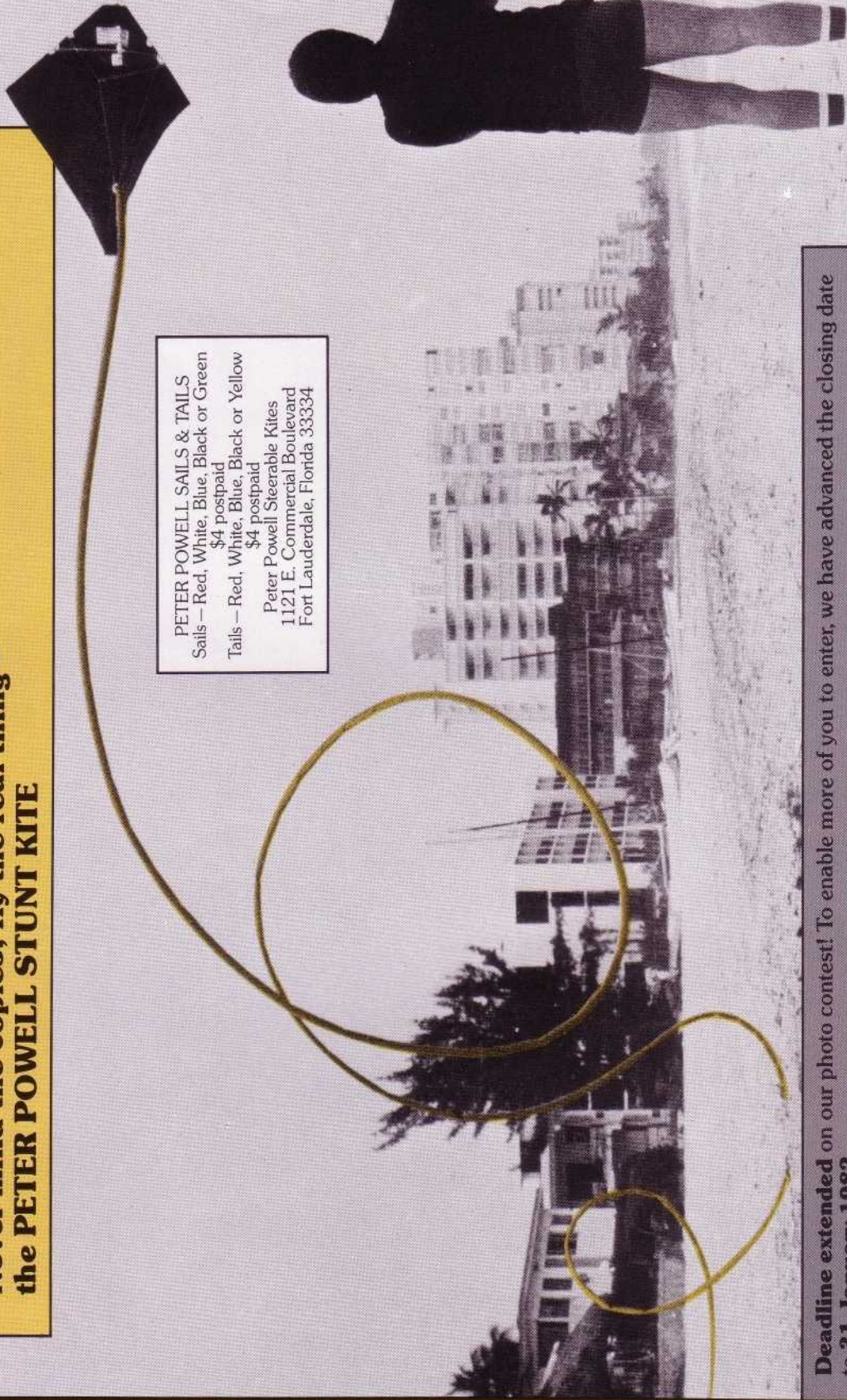
P.P.S. Sundry interruptions and hefty editorial work on this issue ate up more hours than usual for magazine preparation. We regret the delay. In identifying this issue with two seasons, we by no means give up in our battle of the schedule. Also rest assured that you as a subscriber will not miss an issue.

Our quirky schedule is a sleep-robber for me. It's the seat of dreams, some full of demon problems dancing in the skull. I wake and twitch and pound the pillow. Other kinds of dreams are soothing idylls in which the magazine comes out at a regular pace, trouble-free and joyously managed by a big, happy staff in a spotless, spacious office. (That kind I try to prolong.) Somewhere in the middle is the real-life magazine. We're working on making those good dreams a reality.

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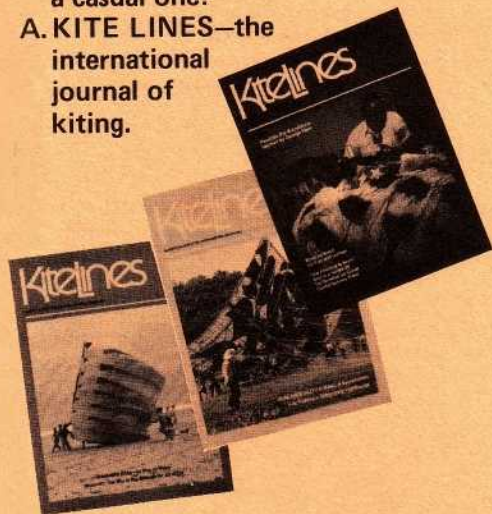
a little puff:

Q.What distinguishes a kite from other aircraft?

A. The line.

Q.What distinguishes an all-out kiter from a casual one?

A. KITE LINES—the international journal of kiting.



Put some kite aficionados together and listen to them talk. Sooner or later they'll mention *Kite Lines*, the singular quarterly journal devoted entirely to kites.

The growing worldwide community of adult kites draws not only most of its new information but much of its sense of kinship from this rare gem of a magazine.

Throughout the United States and around the globe, more people are becoming kites all the time and *Kite Lines* is opening up new skies to all of them. Kiting's multiple layers of appeal as science, art, craft and sport give it enduring fascination. Kite clubs (over 50) and kite shops (about 200) are now active worldwide. These varied groups have one thing in common—*Kite Lines*, kiting's standard of reference since 1977 (and preceded by *Kite Tales* since 1964).

Here you'll read about everything from dual-line stunting and air ballet to oriental fighter kites and inventive designs in space-age synthetics—all in this respected, exciting quarterly, the source of international kite news. Plans, techniques, reviews of kites and books, profiles of kiting personalities, in-depth feature articles—and unusual advertisements, too—fill the pages of *Kite Lines*. Noted for its fine photography, design and printing, in a generously visual 8½x11" format, *Kite Lines* is fit for your coffee table—if you can stand to leave it there. But it's likely to become dog-eared, used, saved and cherished for its authoritative information, available nowhere else.

You can expand your knowledge of kites and find friends in the field—by reading *Kite Lines*.

Kitelines

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Letters

SAFETY OVER EGO

I have been actively building and flying radio controlled (RC) model airplanes for the last 18 years. My kiting activities have paralleled this period of time for almost as long. There is need for self-policing of our kiting activities in order to prevent accidents that could lead to restrictions on us. RCers face problems this way from rules and regulations imposed on them that greatly restrict the use of models and, thus, the enjoyment the hobby gives.

As a reply/suggestion to Mr. Walt Whippo's article, "Kite vs Model Airplane" (*Kite Lines*, Winter-Spring 1981), I suggest that a safer and more adult approach to his problem would be, first, reeling in, and, second, to have a talk with the RC group, especially its leader, pointing out the need to coordinate movements in order to prevent damage to hobby craft, or an accident that could result in serious bodily damage. (I must qualify myself at this point: I deplore the action taken by the RC pilot as much as the response of

Mr. Whippo. Both were wrong!!)

I truly hope others finding themselves in such a position will first consider the safety aspects and react accordingly. It's better to sit down over a beer and hack out differences rather than be aggressive and cause a fatal accident. Let's all enjoy our hobbies to the fullest.

Larry W. Hoffman
Tokyo, Japan

A PLUM PLUCKER'S HOLIDAY KITES

My bag (specialty) in kiting has been Holiday Kites. For each holiday I make an appropriate kite design with painting, graphics, etc., and try to fly the kite on that day, which works well because most major holidays we don't have to work.

The first year this kept me busy every month with preparations for upcoming dates and was stimulating as it centered my thinking about meanings of the day and observances, prompted research for accuracy and appropriate colors, etc. I even bothered to copyright some designs and "Holiday Kites" with Uncle Sam.

Since the years have rolled around for the fourth time, my enthusiasm has shifted direction to other things. There are so many facets to kiting and so much to learn and try, I just keep plucking plums

willy-nilly for fear of missing something and can't keep repeating things I have already done and learned from.

Would a Holiday Observance Kite Festival be of interest to others? Example:
Pick a holiday—Fourth of July.

Place—Philadelphia.

Entries—Flying firecracker, American flag, flying Declaration of Independence, flying cannon, flying you-name-it.

Supporting activities—(which are already scheduled anyway) parades, crowds, banners, balloons, noise (a real happening).

If the first Holiday Kite Observance were successful, it could turn into a series, as holidays are numerous, occur at all seasons, fit various geographic areas.

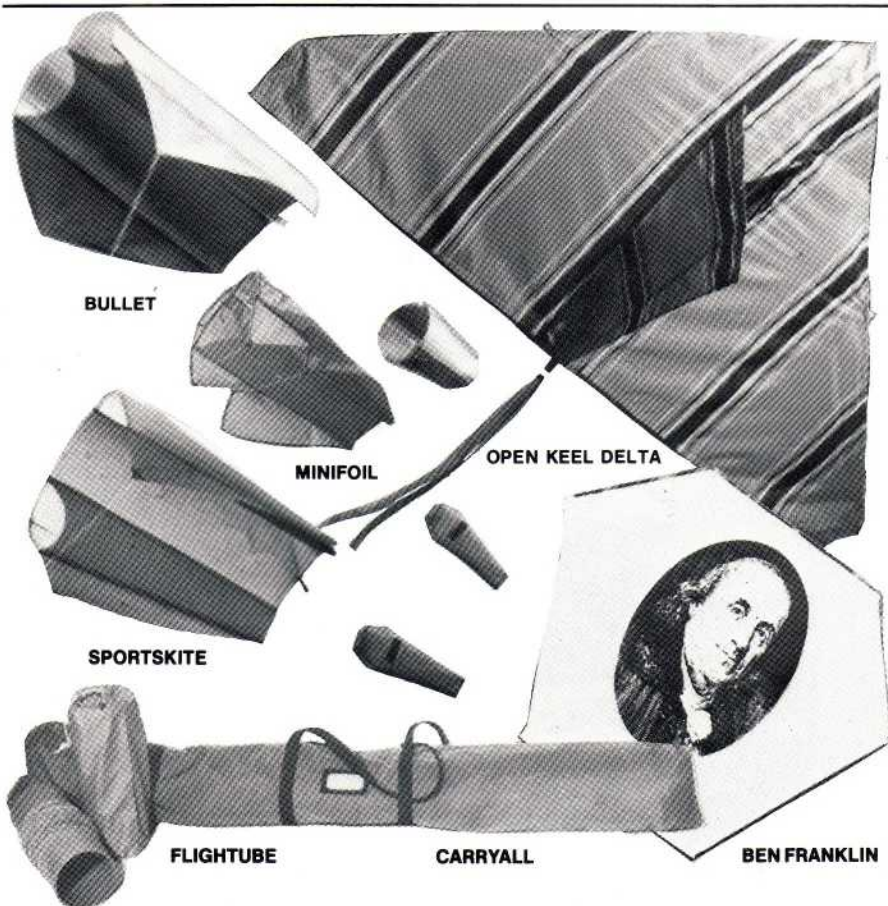
Halloween—pumpkins, ghosts, witches
St. Patrick's Day—snakes, harps, green
Alamo—early flags, Mexican, Lone Star
Benjamin Franklin's Birthday—go wild with keys

Hamamatsu Day—mayhem American style.

On and on. You get the picture.
Happy Holidays!

Carl Poehler
Melrose, MA

"Great minds run in the same channels."
One George Qualls (like Carl Poehler, an



BULLET kite, one of our all-time favorites, designed and patented by Ed Grauel, combines the liveliness of a sled and the stability of a parafoil. Double airfoil surface for extra lift and ramjet action. Rolls up for storage in boat or backpack, always ready for flight. Multicolor ripstop nylon, complete with drogue **22.50**

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Letters

...Continued

architect) had similar ideas about four years ago and sketched some fanciful kites in honor of a few holidays, including—can you believe—Ground Hog's Day.

WALKING-DOWN HAZARDS

I read with interest your item, "A Brief Guide to Safe and Sure Kiting" (Winter 1979-80 *Kite Lines*). There's a paragraph in it about walking a kite down with the line under your arm. This is a rather dangerous practice.

It could lead to one of three results: the additional uncontrolled drag on the kite line could cause a "breakaway," or the friction from the line could cause a rope burn on your coat (and in at least one case has torn a coat in half), and for a third result (although rather dramatic) a strong gust of wind could rip your arm off.

Gloved hands or a pulley wheel are the only safe methods of walking a line in.

Allan Martin

Newhaven, East Sussex, England

Good point, well taken. Of course, the "Brief Guide" was intended mainly to serve the needs of the newcomer to the sport who is flying a moderate-sized kite. Large kites would require a separate set of instructions entirely. Gloves are emphasized in the Guide's Kite Lines Safety Code "Never" Number Four: "Never fly a hard-pulling kite without wearing gloves."

REELS AND LINE STRENGTH

Kite books don't seem to mention the line strengths suitable for various types of reels. Neither do most reel advertisers in *Kite Lines*. Furthermore, I hope I am being constructively critical by pointing out that the "Reels Update" in the Winter-Spring 1981 issue failed to include line strength capacity in its analyses.

How about a few words from *Kite*

Lines to clear up this confusion (or to let me know that I am making a mountain out of a molehill)?

Meanwhile, thanks for a superb magazine that I snatch out of the mailbox and read from cover to cover.

Stephen Smitherman
Miami, FL

The only way we could test reel capacity for different line strengths would be with some fairly fancy apparatus—but when all was done we would be saying, in effect, that it's okay to subject reels to a pressure which none should ever be expected to bear. A kite reel can store line, let line out freely for flying and increase ease of winding in clever ways; but none within our knowledge of the current technology should be expected to haul in kites under pressure directly onto the reel.

ENVELOPE OPTION

My latest two magazines came without an envelope and were kind of messy (the postman!) Could you please send my next issues in sealed envelopes? If it's more money, I'll pay. I like to keep my magazines in good condition.

Jimmy Joe Meza
Los Angeles, CA

We are sorry the post office mistreats your magazine and that we can't afford to send copies in envelopes on general second class mailings. The only way we can sort your name out for special treatment is to put you in our air mail group at \$1 per issue (\$4 per year) extra—if that additional cost does not horrify you. You would also have the added benefit of getting your copy by first class mail (whether you wanted faster delivery or not).

Readers are encouraged to write letters for this column and reply to writers and/or appropriate parties c/o Kite Lines, 7106 Campfield Rd., Baltimore, MD 21207, USA. Letters may be edited for publication.



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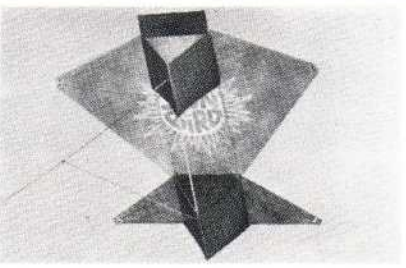
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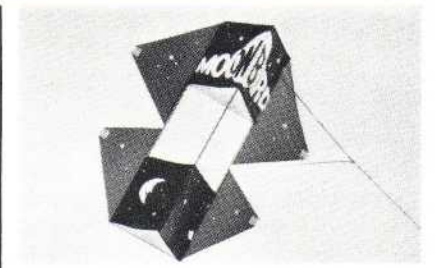
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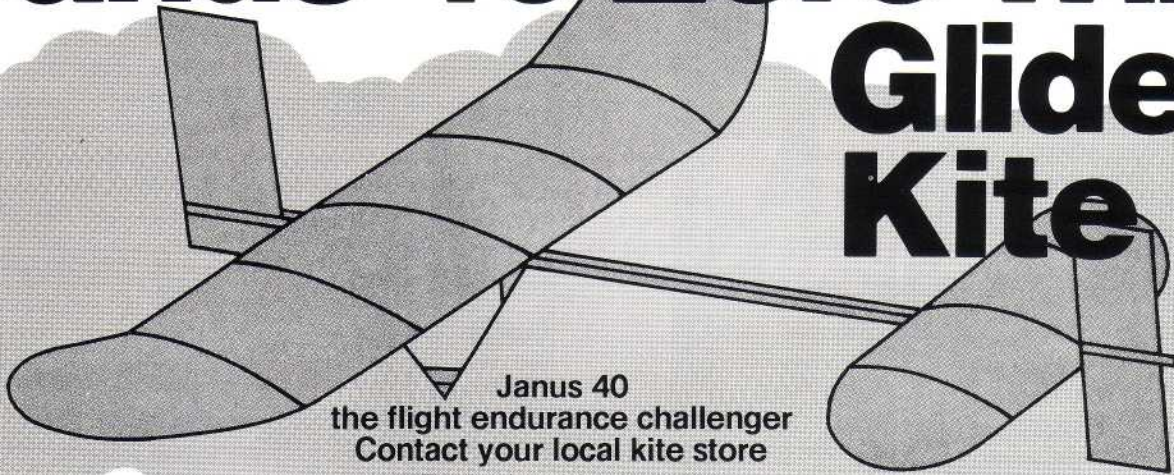
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What's New: Kites, Books, Sundries

Kites

By Mel Govig, assisted by A. Pete Ianuzzi

This issue's potpourri of kites is marked by great variety and superior performance. However, I hope that you will read these reviews carefully because each of these kites has one or more quirks that could be an overriding negative to an individual flier. Read the caveats along with the plaudits.

THE WALDOF MAGIC BOX

Here's another box kite for box kite fanciers and it's a fancier than average box kite. Peter Waldron always offers a certain whimsy in his designs. He lets the flier rediscover his or her kite many times over as all the designed-in secrets come to life.

The Magic Box has at least two new and different touches. In the first place, the kite comes assembled but not unfurled. To make the kite ready to fly, all you have to do is push the cross-sticks in to the middle and insert one dowel into a vinyl tube. Second, the kite has an unusual multiple symmetry, with every pocket, cell stick and connector echoed three times and no point without six identical counterparts.

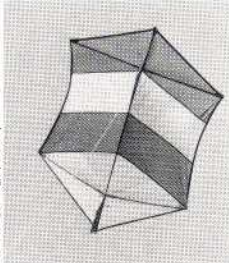
In flight, the Magic Box has a very fast rate of climb and very slow (if somewhat wandering) rate of descent. It can be pumped up to the higher winds easily and flies on winds just below 5 m.p.h.

We had heard grumbles that the Magic Box was similar to an umbrella in more ways than its pop-open assembly. European correspondents complained that it collapsed in high winds. An easy correction for this was found: tying the upper and lower cross-points together firmly on the center stick by means of a strong rubber band or length of kite string.

All in all, I believe we will see a lot of this kite and its inevitable imitators in the future. Pocketbook effect is about \$80.

ROLLERS BY VERTICAL VISUALS

Also from England are the Vertical Visuals kites designed by Mike Pawlow and Jilly Pelham as variations on the originals by David Pelham. From Colorado, Hi Fli Kites, Ltd., is marketing them in the U.S. All three of the kites we tested share three characteristics: they are impeccably made, with careful attention to detail; they are roller-type kites; and they are higher-



A. Pete Ianuzzi

A box kite? No, it's the Cruiser Roller by Vertical Visuals with the illusion of three dimensions.

priced than the average kiter is used to paying—about \$60 to \$150 (no doubt weighted by shipping and customs from the U.K.) There are several VV kites and we are saving some for later review. The rollers get our attention first. All of them have sturdy dowel struts; strong, tempered aluminum (or as the British say, *alumINium*) connectors, which set a sharp dihedral in the sail; taut, evenly stretched covers; and varied hardware to adjust sail tension and bridle angle.

These are no-nonsense kites. If you are flying one of the two larger models, be prepared for a tough puller and don't be stingy with line strength. I would suggest 100-lb. test or heavier line.

The bridle adjustment on the models we flew was extremely sensitive at different wind speeds. If the bridle point was too low for the wind, the kite would descend, like a rock, in a straight path down the same track it took going up. If the bridle was set too high, the kite would overfly and become unstable. With their weight and speed, these kites can be pretty threatening in a power dive. But when the wind is strong and all the adjustments are

right, these rollers are very impressive, graceful and handsome fliers. I believe they should be flown more in the U.S., along with their ancestor, the Sanjo rokkaku.

PETER LYNN'S BABY DRAGON

I was reminded recently that we had never reviewed the little rip-stop cobra kites of our New Zealand friend Peter Lynn. These kites have been available at many shops for a year now and have found their way into many hearts and kite bags. Peter makes the Baby Dragon (cobra type) for about \$12 and his Octopus for about \$10. We're reviewing the cobra only but the octopus is similar.

I admit to being enthralled by Peter's larger kites—the flares and especially the box kite he flew in Maryland in 1978. Peter is a toy designer, wood crafter and business promoter by trade, combining the patient thoughtfulness of the artisan with the energetic, even impulsive, enthusiasm of the innovator. His kites show it, even his little cobras, which carry a few crafty touches that set them slightly apart.

For instance, they have bowed head sticks of fiberglass that can be removed to permit rolling up the whole kite for easy portability. The hem around the head of the kite (which encloses the head stick) is finished with a bias tape cut from the same material as the kite. The ends of the head stick are set into vinyl caps, stitched

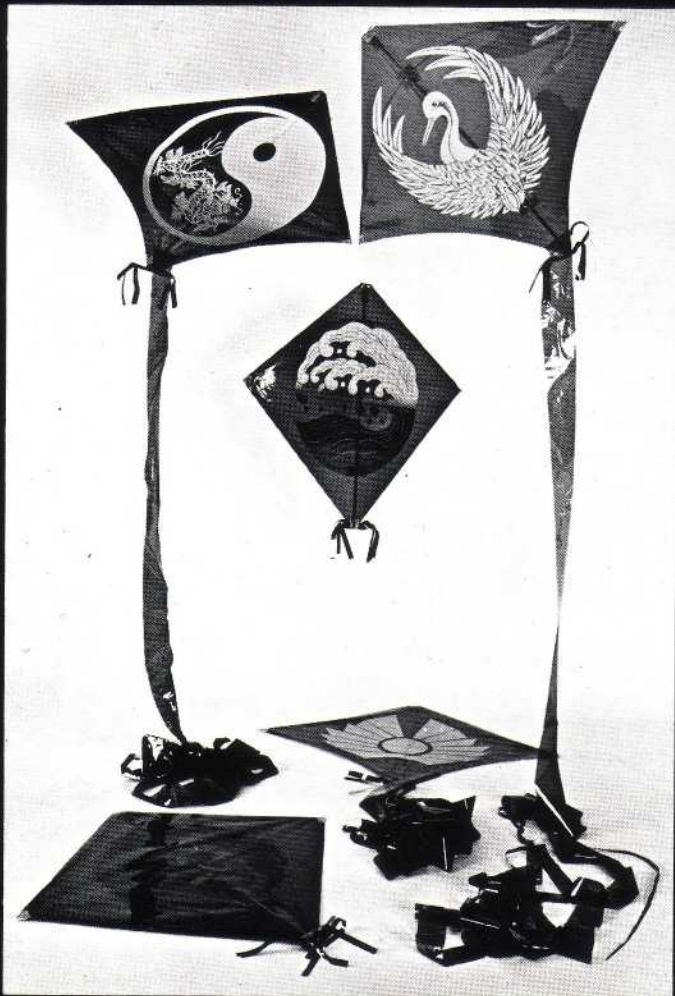
Continued on page 14. . .

	DATA CHART									
	Dimensions	Weight	Materials	P	AT	ED	EWV	AF	SL	
Waldof Magic Box	36x32"	7.5 oz.	rip-stop nylon, dowels	E	1 min.	E	5-15	45-80 ⁰	N	
VV Colorado Roller	46x38"	6.5 oz.	rip-stop nylon, dowels	VG	3 min.	E	5-20	45-65 ⁰	I	
VV Cruiser Roller	60x44"	11 oz.	rip-stop nylon, dowels	VG	3 min.	E	5-20	45-65 ⁰	I	
VV Scirocco Roller	87x62"	24 oz.	rip-stop nylon, dowels	VG	3 min.	E	5-20	45-65 ⁰	I	
Peter Lynn Baby Dragon	11x144"	1 oz.	nylon taffeta, fiberglass	E	0 min.	E	5-15	35-50 ⁰	N	
Hyperkites	9½x22" (x 3)	.75 oz.	rip-stop nylon, ¼" dia. dowels	E	5 min.	E	8-25	30-60 ⁰	I	
	14x32" (x 2)	2 oz.	rip-stop nylon, ¼" dia. dowels							
Trlby Stunter	36x36"	2.75 oz.	Mylar film, fiberglass	E	3 min.	E	3-20	30-60 ⁰	I	

Code: P=Portability; AT=Assembly Time (on field); ED=Est. Durability; EWV=Est. Wind Velocity (min.-max. m.p.h.); AF=Angle of Flight; Skill Level: N=Novice, I=Intermediate, S=Skilled
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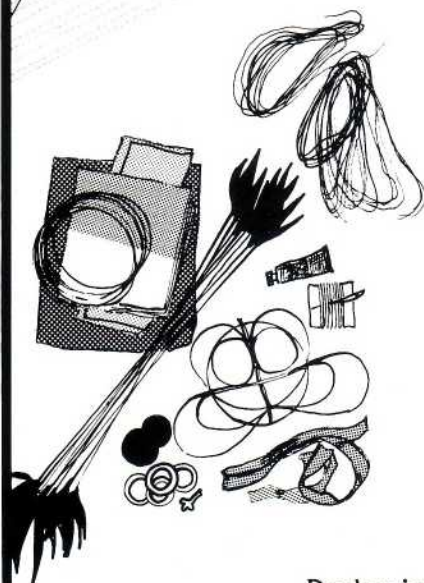
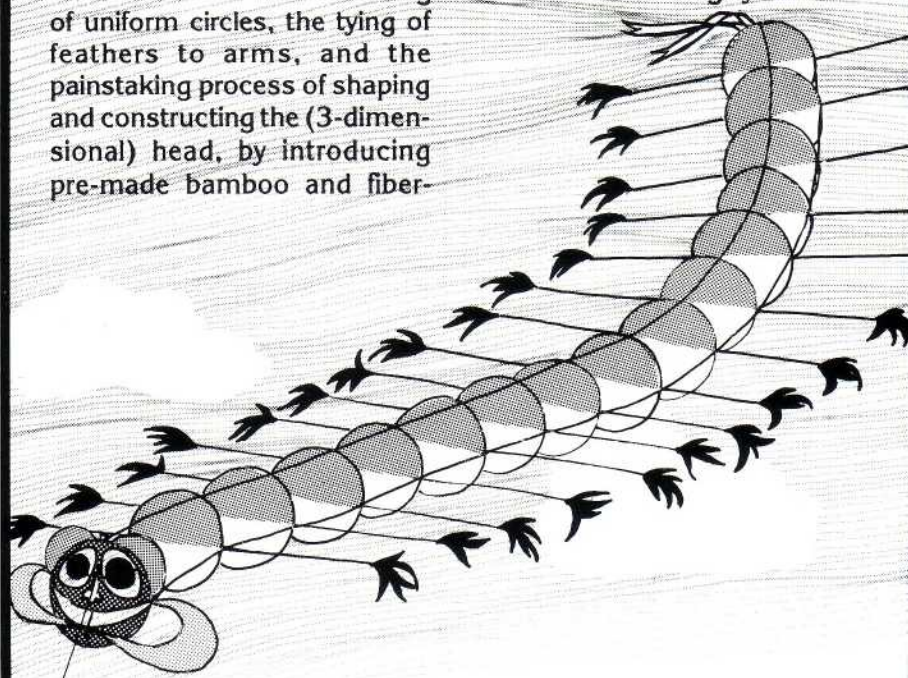
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What's New

... Continued from page 12

into the hem so that the sticks don't poke out through the ends of the hem.

There's charm in the flight of these little goblin-like kites. The tails have scallops cut into their edges with a hot cutter so that the kites have activity, even in the lightest air. Finally, the vertical stick in the head (nose-like) is attached to the fabric, but is 1½ or 2 inches short of the head of the kite. This creates a dihedral both vertically and horizontally, unlike any other kite.

The Peter Lynn kites are very pleasant to fly. They may require slight bridle adjustment for varying winds: higher for lighter winds, lower for stronger winds.

HYPERKITES AND HYPOTHECIDE

You might hyperventilate upon opening your Hyperkites tube if you had just spent what it takes to buy their small craft (about \$18 for one, \$30 for two, \$85 for six).

First, you have been conditioned by this column and your own good sense to think "lighter is better" in kites. But here you have one of these Hyperkites in your hand and it is barely over a square foot in area, less than ten inches high, and it's made of would-you-believe 3/16-inch dia. dowel rods. In addition, the craftsmanship, which would pass for average on a big animal, seems shockingly crude on so small a kite. You're ready to pack it in and take it back, right? *Wrong!*

I took six of these little monsters out to Fort McHenry (the home flight pad of the Maryland Kite Society) and put them up to just see if they would fly at all. They flew! In fact, after my few brief loops and whoops of joy, I collected a parade of eager fliers itching to try the Hyperkites, including Pete Ianuzzi (as always), George Fohs and Ranger Warren Bielenberg of the Fort. I barely got a chance to fly the kites myself.

They are fast, they are fun and they are easy to fly after just a few tries.

It was another hypothesis shot down, another little lesson in humility taught to a man by a kite.

Hyperkites will fly in winds above 8 m.p.h. They have to be in motion to stay flying and need 7 to about 15 m.p.h. to perform. Above 15 m.p.h. they can be steadied-up into the breeze and remain flying, but below their range if you pause they go astray and have to be relaunched. With their strong timbers (for their size) and heavy reinforcing tape (which makes them look so crude), they are practically

Continued on page 16. . .

DESIGN AND PERFORMANCE

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TM

What's New

...Continued from page 14

indestructible. That's helpful for stunters.

If you want a new experience in two-line kites, I recommend the Hyperkites. They are not better than anything else: they are different—and fun.

THE TRLBY/ACE

You have heard me, from time to time, decry the copiers of Peter Powell. I make no secret of my admiration for Peter. Without his enterprise, showmanship and handicraft there would be no stunter market today. I recognize the unusual talents of Steve Edeiken and his lovely Rainbow stunters. I appreciate the work and designing time that went into the powerful Skynasaur and the lively Hyperkites and I appreciate that these kites did not simply copy Peter Powell, no matter what they owe him. All of this is by way of saying that stunter kites that *look* like Peter Powells are at least suspect, if not reject, in my book from the start.

But the Trlby (known as the Ace in England) is not a Peter Powell. It does not move through the air with the same certitude on a 10-m.p.h. wind. It does not execute the same right-angle turns and tightening or widening circles you can achieve with the original—but it is original.

The Trlby is essentially a flat bowed Malay (Eddy) kite, rigged to fly with two lines. When John Stewart, the U.S. representative for Trlby, showed us the kite, I said, "It looks like a fighter kite." He admitted that it could be flown as a fighter, on one line, if you chose. This is the first feature that sets the Trlby apart. The second is that it can be flown as a two-line stunter in winds of 3 or 4 m.p.h. (not many can). Lastly, it is exceptionally durable (taking knock after knock without a sign) and has some unique fittings that will be of interest to home kite crafters—especially the right-angle pieces at the spar tips that fit into the wing pockets—very clever work by the kite's British designer, Max Puckridge.

But having been told that it would fly as a fighter, I had to try. I did! It does! It responds quickly but moves slowly. What's more, because of its size it flies with an unusual tug on the line. I noticed that I could feel the *direction* in which the kite moved and the *speed* of the kite in the string. If I could feel it, a blind man could easily feel it.

Next issue, we will let you know if a blind man can fly a fighter. In addition, we will cover fighter kites in general, available commercial models, how-to flying instructions and a few tips on etiquette for fighter fliers.

Kites that will be reviewed next issue, but which you may wish to try now, are the Aussie fighter (by Wayne Hosking of Action Craft), the Korean fighters (from Great Winds in Seattle), the Nagasaki hata from Fujin in Canada, the plastic copy of the Nagasaki by Spectra Star Kites, the Frank Rodriguez fighters from Go Fly a Kite in New York City, and others compared to the high standards set by the Vic's and Grandmaster kites. Stay tuned!

Books

By Valerie Govig

WOULD-BE BRUMMITT

Our basic kite primer for years has been Wyatt Brummitt's *Kites* (Golden Guide) for its reliability, economy and surprising degree of completeness. Sad news. It has gone out of print. Copies may still be around at retail, but the publisher (Western Publishing Co., Inc., subsidiary of Mattel, Inc.) now offers only the school-and-library version, heavy-bound and bigger ("like a real book," Wyatt likes to say). It also has larger type for those who want that feature. However, we understand Wyatt is now working on a new book. Glory be to Wyatt!

Well, while we wait, what other books can we use? Pelham (of course, a great book), Yolen, Newman, Hiroi, a few others. None like Wyatt's, but here's one that tries:

Kites, by Malcolm McPhun, illus. by Ed Carr (Macdonald, distributed by Silver Burdette Co., 250 James St., Morristown, NJ 07960), 1979, 62 pages, \$4.50.

Now, someone named McPhun has got to be good, right? Well, good is about the level this book achieves. Its format is almost identical to the library edition of Brummitt, with sturdy binding and very attractive full-color illustrations.

The work does have some nice features. The author clearly and accurately describes such things as keels ("two-legged bridles"); effects of hills on wind; posi-

tioning of tails at launch (*in front* of the kite, which is right); flying techniques (well-told); dihedral, tails, decorations, elastic bridles and a "jacket kite" for fun. The bridle drawings are above average (very important) and—wow!—there's an index (a rarity these days). The book's tone is pleasant and unstuffy, obviously the work of someone who's actually flown some kites.

Unfortunately, all these values are just not enough when balanced against the book's shortcomings. Here we find again the overgeneralizations and factual slips that keep coming out in kite books. Why just "three main groups: flat, bowed and box"? Where's the safety warning against rain? Why the caution against "people and animals" and "flying too near other kites"?—vague if not impossible rules. The kite building section is too sketchy, especially about sewing. This is frustrating in a book for children. The list of stiffeners omits square-section sticks but goes on at length about bamboo. McPhun suggests splitting it (to this audience?) and soaking it to shape it but he doesn't specify that water temperature must be hot. Tyvek®'s properties are not distinguished from those of other fabrics. A "stamp kite" appears to be wishful thinking. The flying line is confusingly termed the "control line." And there are the usual

out-of-date and incomplete appendices of shops, clubs and books at the end.

Two particular oddities struck my notice in this book. I had thought that titles brought from England (as this was) and republished in the States are revised to fit the language usage here. Yet we read "polythene," "aeroplane" and "fret-saw" (for hacksaw)—endearing touches, perhaps. But the "60-metre" altitude limit isn't only English spelling, it's English law.

Second, the publisher has imposed some editorial decisions on the book that are less than helpful. The blue "recognition pages," intended to highlight "important" material, instead draw attention to information one least needs to know. The headline "Controlling a kite" appears to have been inserted thoughtlessly by an editor. It is plunked down as an awkward divider in the middle of a continuing discussion of launching methods.

All in all, the McPhun *Kites* is handy, attractive and more often right than wrong. It's also incomplete and untidy, not suitable as one's main kite reference book or even a very satisfactory introduction. This statement applies to so many other kite books right now that these reviews are all beginning to sound alike. One realizes again what a gem of compression, clarity and reliability we had in Brummitt. Write on, Wyatt! ◇

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profiles

The Old Man and the Sky

Francis Vilbe', 81, of La Guerche-de-Bretagne

story and photographs by Jacques Fissier

I love being alone, in a clearing in the middle of the woods. I launch my kite, I commit it to the sky. I anchor it and step back to contemplate it better. I stay there a long time. I especially like it when the wind whistles through the line. I listen to its song. Then I am truly happy.

Kiters will recognize themselves in this simple and sincere declaration. But the testament takes on another meaning when one realizes it is spoken by the dean of French kitefliers, Francis Vilbe, 81 years old, of La Guerche-de-Bretagne.

In the Fall 1977 *Kite Lines*, America's beloved Ansel Toney, who was then 89

years old, was presented to kitefliers. We became convinced that the practice of kiteflying is—in a way—a proof of wisdom. A meeting with Francis Vilbe confirms that conviction.

It is difficult to find La Guerche-de-Bretagne on a map. This very small town of 3600 people in western France is about 40 kilometers (about 25 miles) southeast of Rennes (capital of the province) and is part of what is called *la France profonde* (the true, old France)—quiet and industrious. La Guerche is hidden in a hollow of land parceled up by green pines. Here the farmers still practice raising veal *sous la mere*, that

is, milk-fed, without artificial nutrition.

In La Guerche, the weekly farmers' market and the church bells strike a cadence of tranquility, far from fast highways and people in pursuit of "material paradise."

Francis is recognized in La Guerche—it is well known that he has always lived at 4 rue du Four since the day of his birth, September 21, 1900—but if you are looking for him you'd better ask, Where is the cobbler's shop?—or more directly, Where is the kitemaker?

The door is always open. If he is not there, then he is drinking a beer in one of the nearby bistros or has taken a ride on



his motorbike—with a kite tucked under his arm. Maybe he will be accompanied by his friend, Alfred Lardeux, his spiritual offspring, on the top of a hill. Alfred, a truck driver who hauls hazardous materials, is taking his turn. There will always be at least *one* true kiteflier at La Guerche.

Like Ansel Toney, Francis Vilbe flew his first kite when he was scarcely six years old. He remembers it well:

“My father was also a shoemaker, in the same location, and it was so I would stop playing with his tools that he made me my first kite!

“It was a great day. We had seen a model on a calendar engraving and we carefully constructed the kite, using willow for the frame, very strong thread (which we used to repair boots) and a newspaper. I had watched him make the kite with rapt attention because it seemed like magic to think that these humble materials were going to become a flying object. The machine had the shape of a pear and Papa added a ‘stabilizing appendage.’

“Yes, that was a great day! Since then, I have never stopped flying kites.”

This “Since then, I have never stopped flying kites” covers three quarters of a century. Vilbe would continue, during all his childhood and adolescence, to collect and religiously preserve everything concerning things “heavier than the air which

Francis Vilbe, opposite page, watching his high-angle flier and standing in front of his village shoe repair shop. This page, he’s seen at ease on field; handling his line while his protege, Alfred Lardeux, stands by; and preparing to launch his Roloplan-type kite.

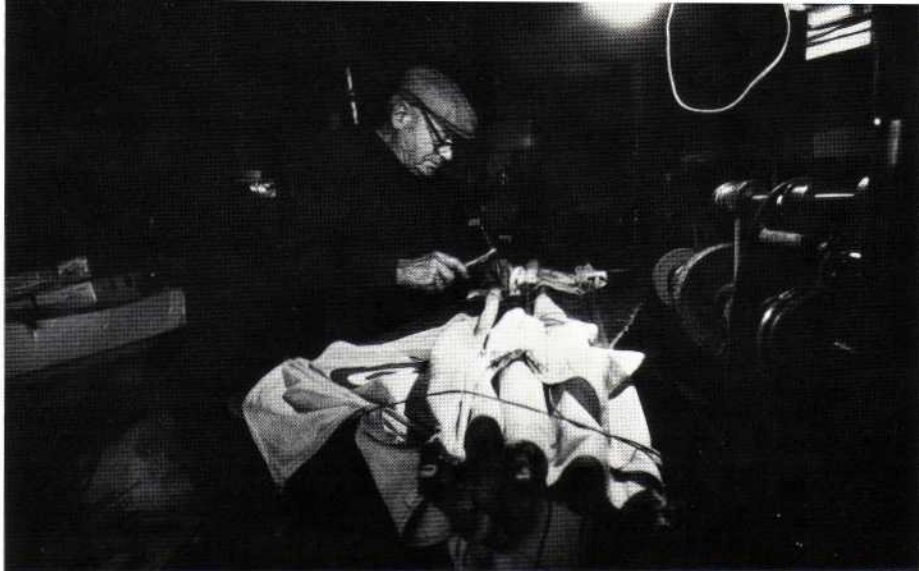


they mock." He knew that the French army and a certain Captain Saconney had organized special observation sections equipped with trains of kites. The "Great War" of 1914-18 broke out and aviation began.

In 1920, Francis did his military service in Morocco. He tried to enter the army air service but the foolishness of the bureaucracy made it necessary for him to become a simple soldier in charge of a small machine shop, and—since it was his trade—shoe repairs. The kites and airplanes were far away! Francis, under the terrible sun of Marrakesh, continued nevertheless to make a few kites.

One day he dared to go see, close up, the first squadron of planes stationed in North Africa. He crossed the runway of an airport and an officer punished him. Definitely Francis Vilbe did not have luck with aviation—but there were still kites! In the recital of his life story, Vilbe often repeats, "I should have had a great career in aeronautics. . ."

After returning to La Guerche, Vilbe married in 1925. From the famous catalog of the *Manufacture d'Armes et Cycles de Saint-Etienne* (mail order) he sent for a book, *Le Manuel du Cerf-Voliste* (The Manual of Kiteflying), by J. Lecornu, engineer and member of the French



Francis Vilbe works on his kites in his shop. He uses some of the same tools on his kites that he uses in repairing shoes, which is his livelihood in the village of La Guerche-de-Bretagne.

Society of Aerial Navigation (what a credit line!) Vilbe also received regularly *Le Cerf-Volant*, a journal of which a collection has now become unfindable. (Francis, big-hearted, previously gave away his valuable archives, not knowing, naively, their true value.)

At that time he specialized in perfecting the Cody kite, all the while following his dream: to construct and pilot an airplane, "his" plane. In his loft he built, little by little, a biplane after the plan of the "Gaudron G3" with a motorcycle

motor. Alas, it never got off the ground.

Then Francis tinkered around with some other Codys. And he discovered the Hargrave, the Conyne, the Roloplan, the Eddy, the Potter. All his creative energy was directed towards The Kite because destiny had barred his route to piloting. Shoemaker by day, he also became a manufacturer of aerial toys by night, like a kind of "Father Christmas" who made airplanes in series with rubber band motors, small Codys, small Conynes. But commerce was not his calling. It was

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In the pasturelands around his village, Vilbe launches his superb kites, including this winged box after the Cody-like designs of French Army Captain Saconney of 1911-13.

the sky that he most wanted to conquer.

In 1953, his wife died. In 1961, a friend from Les Sables-d'Olonne, a whaling station on the Atlantic, asked him to fly his kites on the beach as publicity for its bazaar. With a train of three Codys, he attached a swing and organized ascensions for the tourists. It was a success, it was glory! He was called "Vilbur Wright," an analogy between "Wilbur" and "Vilbe."

The years of the 50s also saw Francis become a hunter of snakes: he caught hundreds of living snakes for the Pasteur

Institute of Paris for preparation of serum.

He remarried in 1962. His second wife said to him, "What good are all these machines? I am going to burn all of them," denigrating dear Francis's kites. She passed away in her turn in 1968.

And again our Francis was alone. Alone with his kites. Not quite three years later, thanks to Michel Dudon of Nantes (a professor of architecture), Vilbe was made aware of the Cerf-Volant Club de France. Not completely alone now, he was visited by members of the club who detoured to

pick him up on the way to kite festivals, such as the one at Dieppe.

He continues to talk. He says that in 1930 he received his pilot's beginner's certificate and he claims that he flew a dozen hours. He states that he flew two-seat gliders and tells how he saw Saint Elmo's fire discharging on his towing line, that he knows well the ascending thermals, that he loves the southerly winds for their dynamic updrafts.

He also says, this good Francis, with tears in his eyes, that he has made (in all) about a hundred kites and that he has given most of them away. He has about 20 left but he feels a particular fondness for an old Cody, 10 square meters in size, which he has christened Marco Polo, after his hero.

As he talks of his life, one senses that there is an underlying antagonism between this blessed solitude in La Guerche, to which he seems so accommodated, and a wild desire to share with others—all others.

Now Francis goes out kiteflying. He launches a craft and watches it as the evening breeze pulls it through the sky.

He murmurs, "With someone, you feel strong. You have someone to talk to. Alone, you lose the weights in the balance of life. Alone, people leave you alone. With two, people notice you." ◇



Nantucket Kite Man

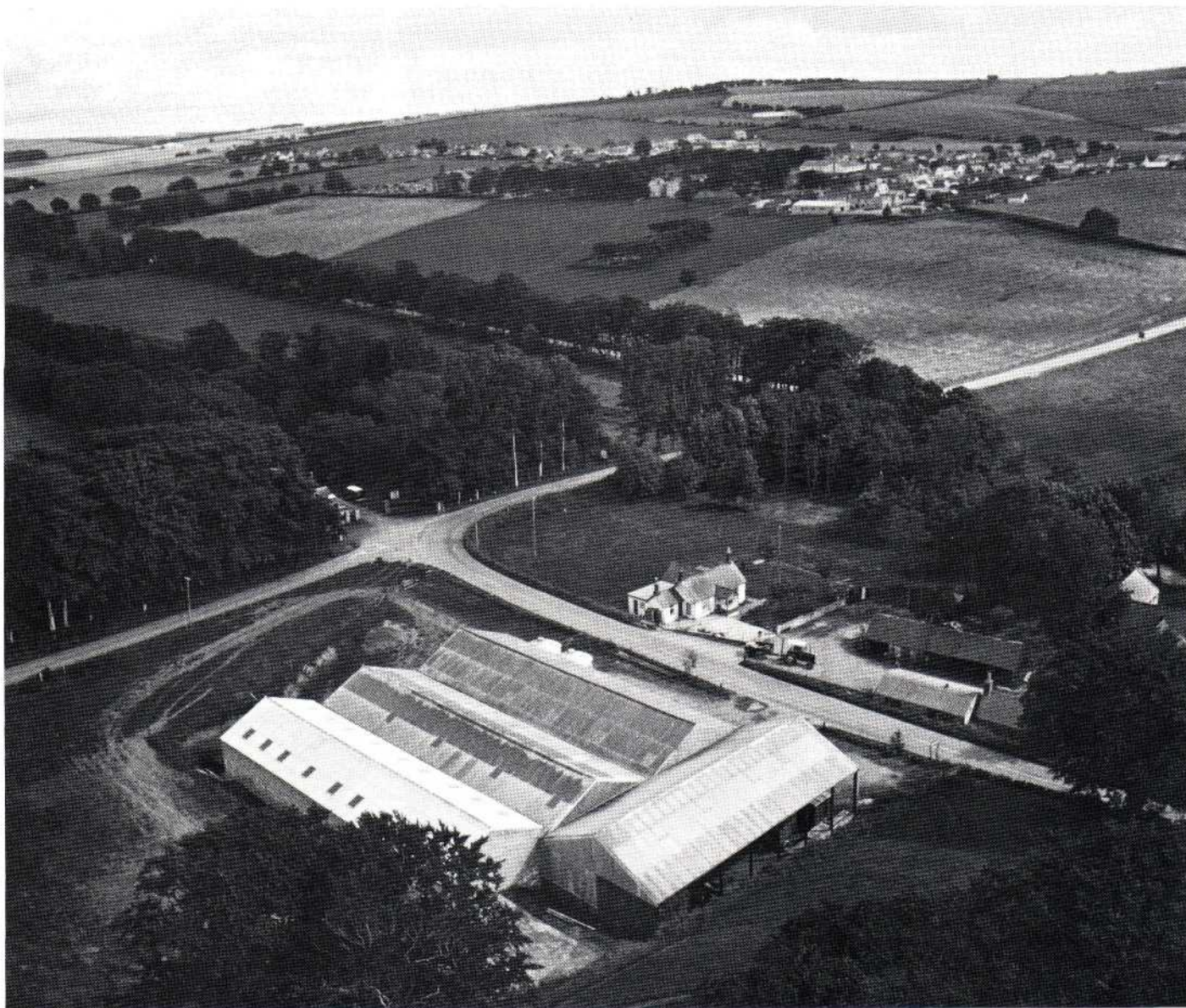
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Winners! in the Cerf-Volant Club de Fr

I have discovered that aerial photographs taken from kites have pictorial advantages over those



① 300 francs: TOM PRATT, SCOTLAND. Photo: "Mill of Pot Farm," Cuminestown, Aberdeenshire, Scotland, taken August 18, 1980, in overcast, gusty weather. Camera: Pentax Spotmatic with 28mm lens and Agfacolor 80S film. Kites and system: two twin-keeled Don Dunford deltas flown from a ground-anchored winch with radio-triggered shutter release. Pratt is a freelance aerial photographer who operates his system alone, working out of his small car. Line is 200-lb.-test nylon paid out double to 200 feet (400 feet of line) to form a continuous loop. A two-section 12-inch-dia. drum is mounted on a folding trestle screwed to the ground with dog tethers. Half the line is transferred to the second section after launch and the line runs through a pulley at the tow point. This way Pratt brings the camera down at intervals to reset it and get "bracketed" shots more manageably than by motorization.

③ 150 francs: MICHAEL G. MILLER, GREAT BRITAIN. Row of bungalows, Pembury, Kent. Miller says he knows "exactly where the camera is pointing."

④ 100 francs: MARION RADEMAKER AND FRANCISCUS COLIJN, NETHERLANDS. Photo: Garnwerd village; Minox, rescue kite, dethermalizer.

⑤ 50 francs: RAYMOND J. PROCTOR, USA. Hawaii Nudist Camp, Honolulu, HI; Minolta, two Parafoils, Cox radio control.



France's Kite Aerial Photography Contest

taken from fixed wing aircraft; only helicopters can compete. — TOM PRATT, 1st Place Winner



② 200 francs: GARRY WOODCOCK, CANADA. Photo: J. C. Saddington Park, Port Credit, Mississauga, Ontario, Canada. Camera: self-built balsa wood housing with 45mm Tessor lens set at f8, 1/500-sec., using Verichrome Pan 120 film. Kite and system: Parafoil, stabilizer vane and dethermalizer timer shutter release. Woodcock prefers 120 film because the entire image of the lens is recorded. This print, though, cuts off about ¼-inch around the edge, which tends to be fuzzy. The top of the circle shows friends with Woodcock as he shoots the picture with the catenary of the line clearly visible.

In October, 1980, the judges assembled at "Le Polygone" cafe in Vincennes (France) to review the entries received in the First Kite Aerial Photography Contest held by the Cerf-Volant Club de France. There were only five entrants (three to six photos from each).

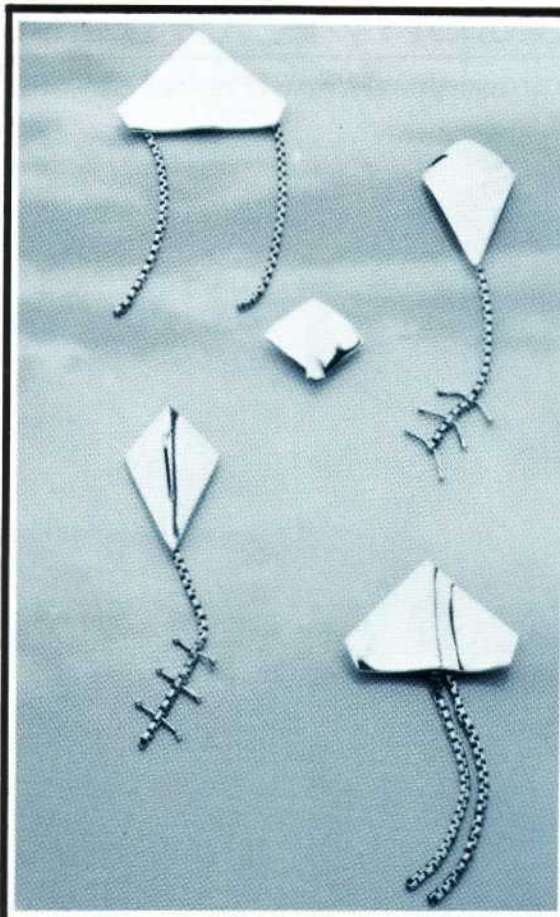
The judges were all members of the club: Georges Rivals, Michel Bouille, Andre Mignard,

Jean Latour and Dr. Fernand Obaton. Jean-Louis Bouisset, club president, presented the photos to the judges in an anonymous manner and points were given on the basis of technical quality and the interest of the site photographed.

Kite Lines wrote the individual photographers and their replies and photos are collected here. Some interesting additional examples we have

found will be shared with you in our next issue.

As we go to press, we have learned from the club that a Second Kite Aerial Photography Contest will be held in 1982, with most of the same rules. Photos taken by kite from January 1 will be eligible and judging will take place in September or October. For details, contact the club: 17, rue Lacharriere, 75011 Paris. ◇



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mastering nylon

or — everything about nylon that I've learned from experience and soaked up from my friends (with source list)

a kitechnology feature by G. William Tyrrell, Jr.

illustrations by Cathy Pasquale

The rustle of nylon, particularly rip-stop nylon, is the ubiquitous sound of kiteflying. Where did this stuff come from and what is it?

Originally developed as a cheap, strong, available synthetic replacement for scarce silk in parachutes during World War II, rip-stop nylon soon became available for other uses. The boating industry adopted it for sails and before long it found its way into clothing, backpacks, tents, luggage, hot-air balloons and—of course—kites!

Why is it called *rip-stop*? It gets its name from its weave. Within the base weave (which is usually very close) there is a slightly larger-diameter thread that runs checkerboard-style throughout the cloth in $\frac{1}{8}$ -, $\frac{3}{16}$ - or $\frac{1}{2}$ -inch squares. This is what gives it "rip-stopping" characteristics. Of course, the fabric will tear if punctured, but the second weave gives the cloth extra tear-resistance. That's important in parachutes, sails and kites.

It's the combination of high strength and light weight that so often makes rip-stop the kite-maker's fabric choice. When you're looking at a cloth that weighs as little as half an ounce to the square yard, the sail on a six-foot delta kite, for example, could weigh under 1½ ounces. And the wide selection of brilliant, translucent colors helps boost rip-stop's popularity.

the coating factor

One of the first things to notice about these nylons is that they are coated. Urethane or acrylic is rolled into the cloth's grain under high pressure and some heat. This gives the fabric slickness and low porosity which to various degrees make the cloth water- and wind-proof. Coatings also give enough body to the fabric that it can be sewn conventionally, on home or industrial machines.

Rip-stop coatings vary almost as much as the base fabrics themselves. They run thick and thin and it's often difficult to tell the true weight of the cloth by touch. For example, a cloth designated as 1.5-ounces per square yard can feel like a 2.0-oz., 1.0-oz. or even a .75-oz., depending on the thickness of the coating and the texture of the fabric you're comparing it to. Heavier cloth with thin or no coating may weigh less than a thickly coated lightweight.

Most coatings penetrate fabric evenly and thoroughly, but some-



times there is more coating—or the appearance of more—on one side than the other. For kites, you present the slicker side to the wind.

Wind, weather and wear-and-tear on a kite you fly a lot will eventually break down the crispness of the coating and soften the fabric.

If you've sewn before but not with rip-stop, you'll find it takes some getting used to, mainly because of its slipperiness—a trait of all nylons but especially rip-stop. The slipperiness is a blessing and a curse—a curse because the stuff slides all over the place, and a bless-

ing because it's easy to realign. (You can lessen slipperiness by dipping your fingers in Tacky Fingers from a stationery store—a tip from Kites of the Four Winds.)

types of yardage

You can find the following nylons on the market at \$1 to \$6 a yard:

PARACHUTE RIP-STOP is, naturally, a lightweight fabric, weighing .5- to .75-oz. per running yard. But it's very soft (little or no coating) yet very slippery—a trying combination to sew with. Further, it's extremely stretchy, highly porous and hard to obtain.

RECREATIONAL RIP-STOP is used for backpacks, tents, sportswear, etc. Colors here are often subdued (except for hunters' international orange). If you need wide cloth (45-to-60-inch), it's a possibility. Weights tend to be heavier (1.5-to-2.5-oz.), coatings lighter. You might work with these for kites less sensitive to bias, such as deltas, taut boxes and big flat kites.

BALLOON CLOTH is a group of nylons and polyesters that have the asset of very wide color choice, making them attractive to artists for use in special designs or applicable work on rip-stop. Widths are 45 or 60 inches, but availability is limited to balloon manufacturers (if you can find one in your area), John Parker or The Fabric Lady.

NYLON, POLYESTER OR ACETATE TAFFETA are close, plain-weave fabrics that are somewhat coarser than rip-stop but still have wind-holding ability, as their use in windbreakers attests. (Acetates do not hold up and are not recommended for kites.) Taffetas are also used for hot-air balloon envelopes (as is rip-stop), tents and luggage. "Aspen Cloth" is one of the names for nylon taffeta. These fabrics are not rip-stops, so once a tear starts they tend to run. The color range is wide for design effects and beautiful cobra ("dragon") tails. Less expensive than rip-stop, taffetas are about \$2.50 per running yard by 45 inches wide, and about equivalent in weight to 1.5-oz. rip-stop sailcloth. A variation on nylon taffeta is nylon cire, satiny-surfaced on one side, used for flight jackets, evening wear and such. The slick side can be good for slipping wind, but examine the bolt for stretch. These taffetas stretch on the bias, or diagonal, rather than the straight of the

grain. They also have a soft drape that flows with the wind, ideal for dragon tails. Taffetas are also suitable for Eddys, Rokkakus, large flat kites and others that gain extended wind range from flex. In picking taffeta, observe its traits, adjust your sewing practices to it, keep your kite symmetrical—and it can work very well for you. Do be careful to choose a low-porosity cloth. Fabric shops offer lots of attractive stuff in an ever-growing selection of blends with high-tech names—not all of which will work well for kites. Don't depend on the clerk to know what you need. Test samples yourself by holding the fabric up to your face and blowing. If air passes, the cloth fails.

SAILCLOTH RIP-STOP OR SPINNAKER CLOTH—ah! the answer looking for our question. This fabric has pretty much all the qualities the kitemaker needs. First is its low to practically-no porosity. This is imparted by the coating we talked about. Available in 38- and 42-inch widths, sailcloth rip-stop comes in up to 15 colors, but the real treat this stuff offers is its range of weights. Here they are, in weights per square yard, before coating (coating adds $\frac{1}{8}$ - to $\frac{1}{2}$ -oz. per yard):

Half- (.5-) oz. is the lightest available. Its tissue-paper-like feel belies its strength. To take advantage of it properly on your kites, you should reinforce the edges by using folded seams or edging tape. This rip-stop is sold only in red, white and blue in 38-inch width.

Three-quarters- (.75-) oz. is not all that much heavier than coated .5-oz., especially if the .75-oz. has a light coating. The .75-oz. is considerably stronger and more tear-resistant than .5-oz., though, and comes in about 15 colors, pastel to intense, from various manufacturers. This weight is probably the most popular for kites because of its strength-to-weight ratio and its easy sewability.

One-ounce-to-1.2-oz. is next. What you've got here is an even stronger cloth with usually more color intensity—a more opaque, rich hue when the sun shines through it. It's still lightweight enough for making super fliers and it's generally available in about eight standard colors.

One-and-a-half- (1.5-) oz. is about as heavy as I'd recommend for most kites in rip-stop sailcloth, but it's very good for large and high-wind designs and big Parafails. One-and-a-half has the most intensity of color, too. It can be useful cut down into narrow fabric strips for use as edge binding on lighter-weight cloth. Also it is popular for kite carrying bags. It sews well because it has more body and less slipperiness than lighter-weight rip-stops. About eight colors are available.

Two-to-four- (2.0-to-4.0-) oz. is a heavy-duty cloth that has little use in kite sail construction. (The exceptions are 1.9-, 2.0- or 2.4-oz. rip-stops or taffetas with thin coatings and still light enough for large sails.) This stuff is excellent as reinforcing material, cut into strips for edging tape, tails, pockets and tabs, and again super for equipment bags. Not quite as many colors come here, but they are bright in reflected light. For great strength, you could make a high-wind, high-angle kite with the 2.0-oz. sailcloth and it would last halfway to forever.

If you're making a very large kite or one that will undergo exceptional stresses, you should ask your fabric supplier for more details, such as strength ratings on the different grades of rip-stop. A strength rating is a composite derived from weight, tear-resistance, weave, coating and other manufacturing factors.

can you color it?

In spite of all the colors available in sailcloth, frustration with limited hues is quite common. You can order custom-dyeing with a minimum quantity of about 1000 yards! Otherwise, uncommon colors—or stripes rarely—can only be obtained as scraps from sailmakers' lofts or similar chancy sources. I have no personal experience with dye-bathing rip-stop in a home tub—my wife would draw the line!—but I would like to hear from others who have tried it.

Here's something to consider: spirit-based **markers**. The two-inch-wide ones are preferable but one-inch ones will do. Simply lay out your cloth on a cardboard surface and draw. Marker inks will dry very fast and leave an intense color if you cover *both* sides of the cloth. You can also use marker **refill inks**, applying them with wide brushes for larger work. A caution with these inks: make *sure* you work in a well-ventilated area, because the fumes are toxic. Learn to work fast with brushes because refill inks evaporate quickly. I'm still in the experimental stages with these inks, myself, but my initial work with this technique has proven colorful. I would be happy to hear from explorers who are blazing parallel trails in this thicker.

Other than with marker inks, no one I've seen has really succeeded at painting rip-stop. Paint usually flakes off, requiring touch-ups after each flight, and tends to be opaque, so that whatever color you see in reflected light on the ground will go to dead black in the sky as it blocks light transmission through your kite.

Opacity occurs with silk-screen printing, too, although some inks made for nylon seem to have the

flaking problem cured. If you are already familiar with the process, you could try it, but otherwise silk-screening would be a lot of technical overlay to pile onto your kiting habit. And of course the point of printing is quantity production, of interest to the manufacturer but not the one-at-a-time kitemaker.

can you cut it?

Okay, so you've got this lovely rip-stop or taffeta—what now?

In logical order of kite construction, you will: pattern and cut the fabric, sew the main seams, sew in reinforcements (hems or edging tapes), attach grommets, tabs, sticks and all the other fixtures—and finally bridle your kite.

Suppose you've got one of those one-page kite plans. You need to lay out the kite parts on wide paper, enlarging them to full size. Large cardboard pieces or big rolls of brown wrapping paper can be used (or smaller pieces taped together if expedient). Margaret Greger, fabric kite mentor, suggests using "pattern-making paper," sold in fabric shops, four feet wide by any length, from a roll, with one-inch dots all over it. She says it's the best thing she's found for making big kite patterns.

In laying out your pattern, keep in mind the width of your cloth. If the kite has multiple parts (like a Parafail), use these pattern pieces to plan your layout on the fabric. Move the parts around until you get maximum use out of the cloth.

(If you're making a large kite, it may be a challenge to find space to spread out all the fabric. We've heard of people thumb-tacking nylon to a carpeted floor to stretch it out and laying out their pattern on that. Just don't cut your fabric on the same surface!)

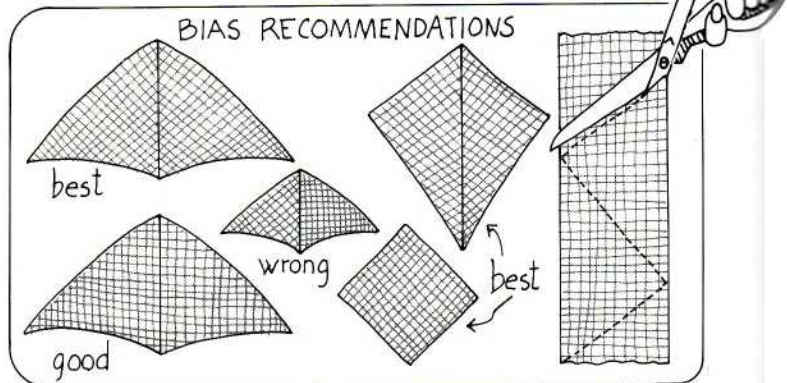
But here's the catch. You've got to observe **bias**. Even rip-stop will usually have more stretch along the diagonal than along the straight of the weave. You want to maintain an even bias on both sides of the kite—that is, vertical or horizontal or symmetrically angled alignment. If your kite (for example, a delta) has bias running on one side differently than the

other, the kite's going to favor one side. (Do you want a political kite?) Even with first-quality rip-stop, the grain may not be dead straight. Lay out the parts by the grain rather than the yardage edges.

Now that you have the kite pattern pieces laid out, draw them onto the cloth. Use dressmaker's marking pencil, which makes a removable orange line, or tailor's (French) chalk on dark colors, or ordinary lead pencil on light hues. Margaret Greger uses dressmaker's tracing paper and wheel. *Make sure you've allowed for enough cloth for your hems or stick sleeves.* (Hem allowances vary with size of kite, but typically are $\frac{3}{4}$ -inch wide.)

Now for the moment of truth—cutting the fabric. You can use scissors, razor cutter or hot iron, as I'll explain. Starting with scissors (sharp, tight ones), here's a tip. Barely open the blades of the scissors and begin a cut, with the fabric held taut by tape or by hand. The blades will slice through the cloth. That sounds tricky, but it's not. You'll be an expert within five cuts. Try it on a few scraps before committing the good stuff.

To cut with a utility knife, X-acto-type knife or single-edge razor blade cutter, use a glass surface or table top, a piece of Formica that you don't care about, corrugated cardboard, a marble slab or the smooth side of a piece of Masonite (though Masonite will dull blades quickly). Glass is the fastest working surface. You can use a wood floor or table if you protect it with at least a half inch of newspaper—the more the better—and don't press too hard. Lay out your cloth on one of these surfaces and use a straightedge to guide your knife or single-edge razor blade. (Use only a blade that is new or very sharp, especially so at the tip.) The straightedge can be a yardstick (metal is best), piece of wood or even heavy cardboard if you're careful. Hold the straightedge or cardboard pattern down tightly, particularly when you're starting, and cut slowly but steadily, holding the knife flat against the rule edge. If you're cutting one layer of fabric at a time, you won't need much pressure; only with "mass production"



do these details get critical. You can use scissors for one or a few kites, of course. The advantage of the knife/straightedge route is that you obtain straighter lines.

Incidentally, I've never had much luck using pinking shears to fray-proof rip-stop. But Ed Grauel swears by his and says "The secret is shears large enough—I use 10½-inch size—and keeping them sharp." (I admit to never having tried to sharpen pinking shears.)

the hot cutting alternative

Ultimately, however, *hot cutting* is better for cutting single kite parts because it seals the edge of the cloth, making it frayproof. Cold cutting of edges (to different degrees, depending on weight and coating) leaves an edge that may fray. If you're hemming or taping the edges anyway, cold-cutting is OK, but anywhere that you have a raw-cut edge, hole or vent, you should hot-cut the edges.

How to hot-cut? Again, use a glass surface or Formica. Masonite works, too, but may adhere to the cloth at the edges. (This is usually cleanable but sometimes leaves a stain.)

Your hot cutting tool can be an ordinary pencil soldering iron. A wood-burning knife can also be used. The trick is to match proper heat with tip design and your hand speed. A 25- to 45-watt model is suitable for light cloth or slow cutting of heavier cloth. You should have a tip temperature of 500° F minimum (preferably higher). Use 55- to 80-watt heaters with 700-to-1000°F tip temperatures for heavy cloth or high production on light cloth. Some kite-makers get satisfactory results with a small 25- or 30-watt soldering iron with the tip cut to ½ to ¾ inches and filed to a rounded flat sharp blade (like a screwdriver).

Though a pencil point or ground flat spade will work, probably the best tool is a sailmaker's tip made for the purpose. Curtis Marshall's customized silver tip is said to be the best of all and it works *very* fast if you have that need.

Once the iron is up to heat and stable, simply cut along your Masonite pattern or straightedge (not metal, which seems to draw heat out of the tip). Move the cutter as fast as the cloth will separate. You can weight your pattern with lead diving weights, gallon cans of paint, books or whatever to free your other hand to *lightly* pull the cloth away as it is cut. If the iron isn't cutting smoothly, slow down your hand speed. For mass production, use a hotter iron. Also for repetitive work, a Teflon® wheel guide as made by Curtis Marshall and used with a cone-tip hot-cutter will save pattern wear and provide a

uniform and automatic hem allowance to your needs.* For one-at-a-time kites, you can work with more ephemeral equipment. Like Margaret Greger, you might find tagboard and paper (either lightweight kraft paper or white tissue paper) adequate for patterns, especially applique. Margaret says, "It's true that a little paper edge may remain on the fused edge of the fabric, but it's easily pulled away. When I am cutting fine detail, where weights are too big for holding the pattern in place, I use my fingers, and when that's too close for comfort, the eraser end of a pencil."

Some more "hot tips" for the cutter tip: Lightly file it sharp (not razor sharp or it will tend to wander). Also keep it clean with a wire brush. If it's dirty, heat transfer will slow. With a little practice and the right tools, you can cut nylon like a pro (or if you're a pro then like a dedicated perfectionist amateur).

Incidentally, you can achieve the sealed edge of the hot cutter without buying the tool by running the cut edge of your rip-stop pieces carefully alongside a candle flame, allowing just the edge of the fabric to slide into the flame. A little tricky, but some people claim success with it. (Be careful!)

A word to the wise: *ventilate* the area, or work outdoors, when hot-cutting rip-stop, to minimize inhaling the fumes. And (in case it isn't obvious), make your entire kite workshop, with its hot-cutters, razors, fumes and sewing machine, *off-limits to children*.

getting set to sew

If you don't yet have one, now is the time to make a work area for yourself with all your tools in one place and plenty of light. A large work table is an almost-necessary accompaniment. (Ed Grauel's model of a shop has a converted-door table, outfitted with measuring tape along the sides and neatly labeled storage boxes underneath.)

I suggest you occasionally reread the booklet that comes with your machine. (I'm still learning from mine!) Make sure you oil your machine occasionally, following instructions in your manual. Keep the machine clean; vacuum or blow lint and dirt out regularly ("so important," says Harry Osborne, who ought to know). Wind bobbins slowly and evenly: fill several in advance for big kites.

Don't sew unless your mental and physical outlook is good. You will waste good fabric otherwise. Sew at a steady pace, not in spurts, to keep your stitching even.

Can you sew rip-stop by hand? Yes! Louise Crowley's kites are

*Curtis Marshall, "A New Nylon Cutting Technique," *Kite Lines*, Summer 1979, p. 19.

wonderful examples. But most of this article pertains to the more usual machine sewing.

which comes first, needle or thread?

For domestic sewing machines, there are two basic needle choices: the ballpoint needle (for knits and the like) and the regular sharp point, which is what you need to spear through the tightly woven, crisply coated rip-stop. If yours is an industrial machine, get acquainted with its parts supplier. He or she will have oodles of needle types for every kind of fabric, machine model and use. You can really match the needle to your work. You'll be looking for a very long taper in what the industry calls a high-speed, anti-friction, cool-running "coated" needle. A "government" needle (a long taper design) gives less puckering of seams in rip-stop sewing.

As a general rule in needle selection, use a thinner (lower-number) needle for thinner materials and a thicker (higher-number) needle for thicker materials. Also adjust your selection to the total thickness, or plies (layers), of fabric you're sewing together. Below is a chart prepared for *Kite Lines* by Harry Osborne, director of the clothing and textile department, Edmonds Community College, Lynnwood, WA. Keep several needles on hand as you sew and *change the needle often*. A needle can grow dull after as few as eight hours of sewing.

NEEDLE SELECTION CHART

A = nylon in ounces per sq. yd.
B = needle for 3 or fewer plies
C = needle for 4 or more plies or bindings, reinforcements

A	B	C
.50	11	11 or 14
.75	11 or 14	14 to 16
1.5-2.0	14	14 to 16
2.0-4.0	14 to 16	16 to 18

Threading your way through this maze? Now about thread. As the needle selection is governed by the fabric you're using, thread choice is determined by your needle. Polyester or nylon thread is recommended. Polyester is more flexible and will hold thread tension better through the machine than nylon. However, nylon is generally stronger than polyester in the same size. Gutermann's is a strong polyester thread for machine sewing and comes in many colors.

A popular thread in fabric shops these days is "crystal" thread, in fact a domestic nylon monofilament. It has all the characteristics of mono line: strength, invisibility, economy and kink-proneness. Our friend Margaret Greger warns of the kinks and also of "bargain" thread at four for a dollar, which frays and isn't worth the savings.

Margaret uses ordinary dress-maker's cotton-covered polyester thread for all her small to medium-size kites. Neither it nor the polyester thread in most fabric shops is sized. These threads appear to be the equivalent of old-fashioned 50, suitable for most needles and sewing conditions.

When you get into the serious-sized kites, the Parafoils or other highly stressed kites, I recommend stronger polyester or nylon thread. If you're making multiple kites, small spools can be expensive, so consider buying bulk thread in half- to one-pound spools. (No waste here—you can always fly small kites off a large roll.) Tailors' or sailmakers' suppliers have 30-, 40- and 50-denier polyester or nylon thread for sewing sailcloths and taffetas. (Check your yellow pages for sources.) Parachute Grade B military nylon is another good choice, limited in color but cheap. I regularly use it with a number 14 needle on almost everything I sew. Whatever thread you use, *cut it*, never break it.

Guide to Needle and Thread Selection	Needle	Thread
	11	60 to 80
	14	40 or 50
	16	30 or 40

Guide is based on polyester or nylon thread, not cotton. Note: needle size (thickness) increases as number increases but thread thickness (denier) increases as number decreases.

One of the ultimately-ultimate uses of thread I've ever heard about was by a young Parafoil maker named Rick Frederick whose kite won Grand Prize at the Maryland Kite Festival about four years ago. It was sewn in panels of striking color contrasts with thread to match. Yes, the color on the top stitch matched its panel and *another* color on the bobbin stitch matched the adjacent panel!

stitching basics

Stitch length is an important adjustment. Set your machine at eight stitches per inch for basic straight stitching on rip-stop. A finer setting will weaken the cloth and may cause tearing at the seams.

For zigzag sewing, the stitch length can safely be set tighter, typically at 15- or 16-stitches-per-inch, which doesn't exceed (in its effect on the cloth) the eight-per-inch standard for straight stitching. Up to as fine as 20-per-inch can be used for a satin stitch around an applique. Needle choice for applique work should be an 11 for .5- or .75-oz. rip-stop or taffeta and a 14 needle if you're working with a lot of thickness.

Be sure you're using the right foot and throat plate for either straight stitching or zigzag stitching, according to the requirements

of your particular machine.

To get used to rip-stop's slippery ways, try out some stitches on scraps. Make your machine settings and note the tension level on foot and thread settings. With practice, you'll develop a feel for rip-stop work and how to overcome its slipperiness. (To get real control over the material, you might want to buy a "roller foot" for about \$1.50 at your fabric store. It grips your fabric like a tiny snow tire.)

Now, for an exercise, line up two straight pieces of fabric and make an ordinary seam, *holding the sewn end with your left hand* while aligning the edges of the rip-stop with your right as it goes under the foot. Nylon *always* needs your guiding (not pulling) left hand. Go slow and easy at first. Secure your seam ends by back-stitching or lock-stitching a few stitches in place.

Rip-stop needs constant attention to the aligning process. *Guide* the cloth through; let the machine do the work. Don't apply drag with your right hand or pull with your left. Either of these can break needles or thread or jam the machine.

A clue that something is wrong is when your stitches are running much denser than usual for no apparent reason. This is caused by extra cloth drag or weight, or by too much vertical machine foot pressure tugging on the foot/feeder/needle operation. Let the machine, correctly set, control the speed of the cloth and consequently the stitch length.

An exception to the above practices is sewing very large panels or heavy fabrics. Just try a piece of cloth about ten feet square! The weight creates tremendous drag over the edge of your sewing surface. To correct this, work on or next to a larger table or persuade an accomplice to catch the flowing fabric and keep it off the floor. With practice you'll develop a feel for how much backward pull you can get away with to compensate slightly for extra cloth weight drag. It won't be much. Mel Govig and I discovered this phenomenon when we built a 3,200-square-foot American flag of 1.5-oz. rip-stop on our home Singers.

You can sometimes save time by stitching several items in succession, feeding one after another through the needle without clipping threads until several sections are done, then clipping between sections.

When you're sewing over thick seams or reinforcement bumps, slow down. Turn the wheel by hand and/or lift the presser foot as you move till you get through the thick section.

Margaret Greger says that she follows the dressmaker's rule to stitch seams from the widest part to the narrowest. This means you will have less trouble with stretch-

ing on the wing stick casings of a delta, for example, if you stitch from the base of the kite toward the tip. She believes that symmetry in a fabric kite is safeguarded if all seams are stitched in the same direction (especially important with sled stick casings and Parafoil construction). If, for instance, you hem the edges of a sled, follow the wide-to-narrow rule on the wingtips. Don't start at one point and hem all the way around. Many materials will stretch and pucker and symmetry will be lost.

trouble-shooting

Let's check out some of the problems associated with needles, threads and stitching.

If you hear a popping sound coming from the crisp, coated rip-stop as you are sewing, it indicates a needle problem. It can be that you're using a ballpoint instead of a sharp point, in which case simply replace it with the proper needle. Or you may be using a needle that's too thick for the cloth; if so, try one size thinner. Or it could be the result of using a dull or damaged needle, which you should simply replace.

Sewing with a damaged needle or an oversized or wrong point can also fray the cloth on the bobbin side of your sewing.

Needle breakage or bending can occur as the fabric deflects the needle during sewing. A bent needle must be replaced at once to prevent damaging the fabric or seam quality and slowing down your sewing.

A too-heavy needle used on thin material will cause cloth to pucker so you won't get a flat seam. Worse still, it will give you a loose stitch that will weaken the seam and lead to a tear. The hole being made by the needle is bigger than the thread.

If the needle is too thin for the thickness of the material you're sewing, the machine will indiscriminately skip stitches. The needle thread (as compared to the bobbin thread) may also break.

Sometimes the machine needs adjustment of the feeder plate.

Some machines are owner-adjustable, others require a service technician, but you can check on it yourself. Turn the machine's wheel till the feeder is at its highest point of travel. The bottom groove of the feeder teeth should be even with the top surface of the throat plate. If your feeder is too high or too low, height adjustment will be needed. You may have to see your service person, but don't be afraid to make adjustments yourself if your owner's manual tells how. The adjustments are surprisingly easy. If you have a diamond-toothed feeder, replace it with a more correct straight-toothed design for rip-stop sewing.

edge binding methods

A hot-cut edge on nylon seals the threads and prevents raveling well enough to satisfy many kites as an edge finishing method. The usual hem or framing string may be dispensed with on smaller kites. But perfectionists will discover that fraying can start after extensive flying or heavy winds, especially on a kite that has flutter in its trailing edge. For this reason, or if you are cold-cutting your kite, you may want to bind or hem the edges.

There are various kinds of binding tape. Bias tape is a narrow cloth trim in a polyester-cotton blend, in nylon or occasionally in all-cotton. Nylon matches the sheen of our cloth best, but polyester is good, too. Cotton is not suited to kites because it fades and shrinks. The double-fold bias tape has a finished edge about ¼-inch wide and is ready to be slipped over the edge of the kite and stitched in place without the use of a binder attachment on your sewing machine. It is good for binding around sharp curves. Grosgrain and herringbone twill tapes will also bend in curves but not as tightly unless you use a sewing machine folder attachment.

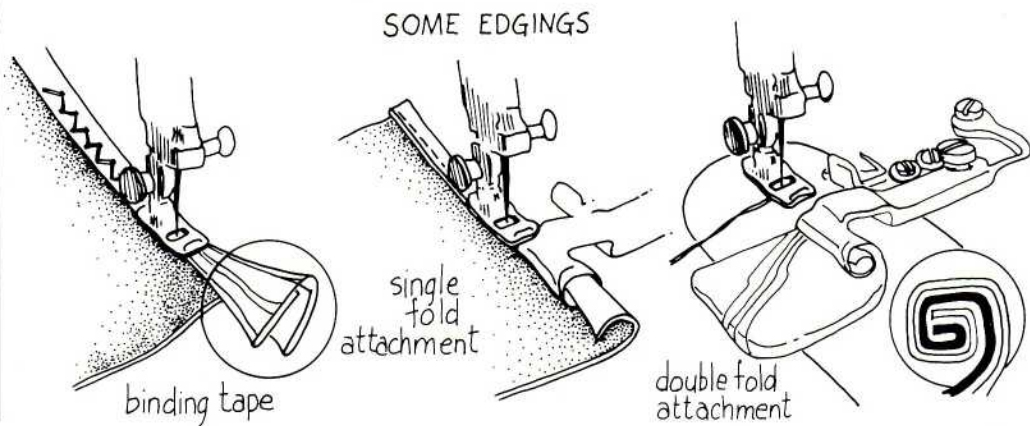
You can cut your own strips of cloth to turn into edge binding. Use a weight of fabric about equal to .75-to-2.5-oz. rip-stop. Heavier

can be used but it will take more adjustments on your machine. Cut on the bias of the fabric for tape that is to go around curves; cut on the straight of the grain for stick sleeves or any strong, fixed hem. If you hot-cut the rip-stop, you only have to fold this ½- to ¾-inch binding once. Wider is easier to handle. Practice on scraps. Folding edging material by hand is slow going but can be done with practice. Using an iron helps.

If you find yourself making lots of kites, you should consider a binder attachment for your machine. If you standardize on one kind of binding tape, you'll get your money's worth from the attachment, which costs about \$5 to \$10 for a home machine. This works well for occasional use if you can match the binding material to the attachment. If you are making multiple kites or manufacturing, then a professional binder attachment, custom-made for your machine and binding, is recommended.

Here are some tips on stitching techniques for applying binding tapes. You can use either a straight stitch, eight to the inch for strength, or a zigzag stitch for more width of coverage. If you're using the zigzag, make sure tension adjustments give you a stitch that's tightened down snugly. If you can't get enough adjustment before the thread breaks, use stronger thread. If using a home machine, you may need more thread tension range to get through thicker sewing with edge bindings. Here's a trick that works on my 10-year-old home Singer; it may work on yours, even if it's another brand (check with your serviceperson): you can take the outer thread tension knobs and dial off. This will give you a few more threads of adjustment range.

Also, when going around corners or binding more than one piece of cloth together with a narrow edging, you may have to inch your way along slowly, touching the switch lightly. A zigzag doesn't use quite as much thread tension and can cover a ¼-inch width or a curve better. Zigzag can be ripped



out more easily, too, if you make a mistake! If your machine has lots of choices of stitches (with cams or switches), my favorite zigzag for rip-stop is one that stitches three or four strokes for each zig and each zag. It's called a multistitch. If you like fine detail, you can use decorative stitches in thread of contrasting color.

hemming treatments & taffeta strategies

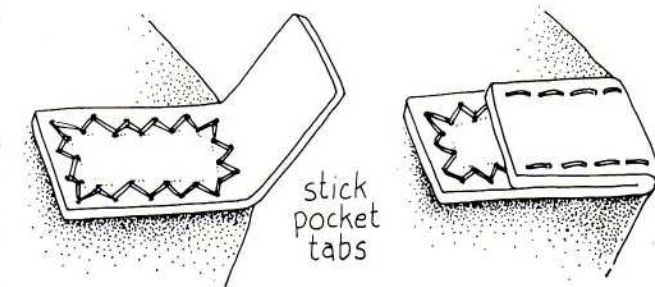
Instead of binding your kite's edges, you can choose simply to hem them. Fold the edges twice (we fanatics don't use just one fold), either by hand or augmented by iron (to press the first fold) or by a hemmer foot. Singer used to make an adjustable hemmer foot, but you may have to scavenge the service department of your local dealer to find one now. Caution: a hemmer foot isn't at its best with the slipperiness of rip-stop, but will work better with the less shifty taffetas, which don't hold a crease as well as rip-stop and thus require you to use more refined hand techniques. You can also accomplish a double fold hem with a professional folder attachment that leaves no raw edge to show even on the back of the kite.

There's a nice zigzag finish that Steve Edeiken (on his Rainbow stunt kites) and Mel Govig use. They run a narrow but elongated zigzag stitch right along the *very* edge of the raw (hot-cut) fabric. (Try it on a scrap and see what happens.) A light cord can be run right inside the stitch for more strength. It's quick and neat for an Eddy-type kite, for example.

Some more tips for taffeta users: Save your scraps to use in patching or repairing later, since taffeta is more apt to tear. Hot-cutting an edge makes it easier to align and sew. Nylon edge binding (which doesn't stretch) is a good treatment for taffeta. A very slight exertion of tension on the seam, both ahead and behind the needle, while stitching taffeta, can sometimes help with control, but be careful—too much or too little will make the fabric pucker. Ripping out stitches is easier with taffeta than rip-stop and the old seam will heal better.

pockets & reinforcing

One way to make pockets for kite sticks is simply to use one of the tougher edge binding tapes, such as grosgrain, about 1-to-2½ inches wide, depending on stick diameter. Ed Grauel suggests allowing additional sail area to fold over on itself for pocketing. This is appropriate, of course, only on heavier cloth. If you're using your own fabric strips, 2.0- to 4.0-oz. nylon rip-stop or taffeta is very good. The final sewn pocket should



be about two to three times as wide, and about four to five times as long, as the stick diameter. Hot cutting helps keep the edges from fraying. Position the pocket on the kite and sew the two sides; the fold will form the bottom without sewing. If the pocket is large (over 1½ inches wide), sew the open pocket on four sides to the sail, then fold over the flap and sew on the two long sides to finish. Although a stick can wear through almost any pocket, nylon seems to wear the best.

Where you need extra-strong pockets, you may want to use tough nylon webbing material or even leather, as Cloud Pleasers does on its deltas. Leather requires a special needle to sew and scissors to cut, but might be worth the extra trouble in exceptional cases.

Nylon bindings, whether ready-made or cut by yourself, work well as reinforcements for holes, grommet mounts, bridling points or load distribution tapes. You can also use the more flexible tapes to outline appliques or vents.

Another use for nylon edging tapes is in modular construction of large kite sails made of very lightweight (.5- to .75-oz.-per-sq.-yd.) sailcloth. Parachute canopies and hot-air balloon envelopes are made this way. The technique applies especially to kites that are made from several bolt-widths of cloth. The panels of cloth are sandwiched between two load-carrying nylon tapes in such a way that the panels are sewn only to the tape, not to each other. An advantage of the system is that damage is contained to the modules, which can be more easily replaced

or repaired than a whole sail.

A strong way to reinforce a vent or hole is to tape (Scotch or masking tape) a patch of fabric over the area to be cut out. Hot-cut the patch and sail together. This will "weld" the two edges together. Sew up and remove the tape. (Try not to sew through the tape; it may gum up your needle.)

A similar technique calls for adhesive-back or crack-and-peel rip-stop, a material that is used by sailmakers for repairs, quick lettering and applique work. You simply hot-cut the stuff, crack the backing off and stick it on. For maximum adhesion, keep surfaces clean and dry, and burnish the crack-and-peel with pressure using any hard, slippery tool (a screw driver handle, bottom of a glass or cup, bottle cap, etc.) The idea is to get the maximum bond through pressure, especially at the edges. Done right, the patch will have a more transparent look than if you applied only thumb pressure. Adhesive-back rip-stop needs no sewing and is especially good in a hurry. Like most adhesives, it works even better warmed up. The press of a warm (nylon setting) iron will make more permanent adhesion.

Anytime you attach or pass a line through your kite's sail, wear and tear sets in, even where you've put grommets. To relieve all those vulnerable points (keels, ribs, spar hook points, tail or drogue mounts or banner mounts, etc.) you need reinforcement. The easiest and fastest way I know to make a hole to accept a grommet is with your pencil soldering iron. Just melt a hole right through the sail with its reinforcing material folded over it.

Grommets should never be set directly into fabric but should be cushioned by extra material (edge binding tape, doubled self-fabric or adhesive-back rip-stop). Grommets and grommet-setting tools are a stock-in-trade of most kite-makers. My personal preference is for the ¼-inch hole grommets (⅜-inch dia. for large kites) because the larger diameter spreads a load over cloth better than a tiny eyelet. Again, practice on scraps.

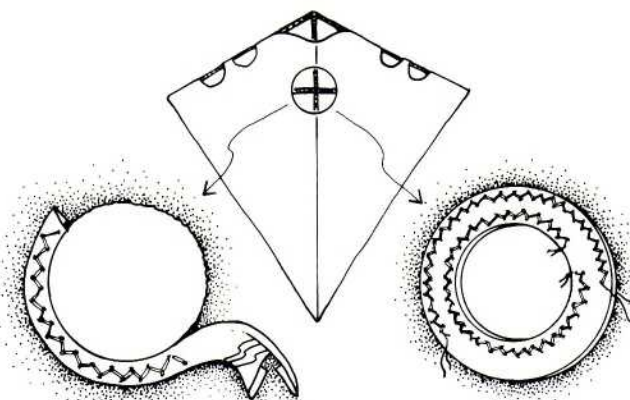
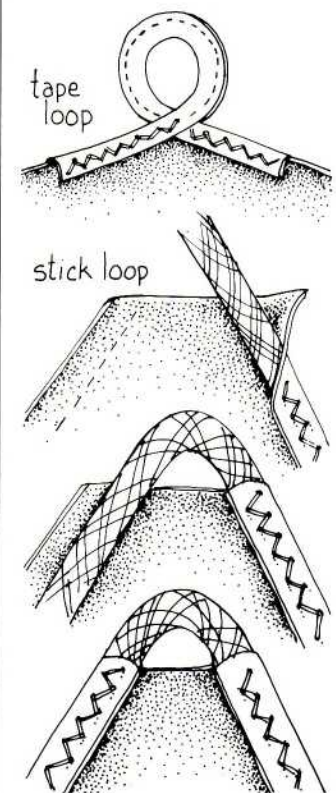
By the way, a quickie hole (not strong, just quick) can be melted through nylon if you need a pass-through for a bridle, for example. Light a match, blow it out and apply quickly to the cloth while the match is still white-hot. (You always have matches around to seal line ends, don't you?)

tips for tapes

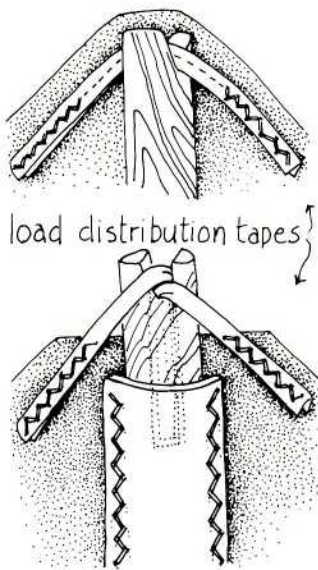
Techniques for loop-making can help binding tapes do double duty on your kites.

For example, on kites with fins or keels, you can insert a short length of tape (the width of the hem) *inside* the hem, making a loop of about one to two inches long (depending on size of kite) to extend out from the point before you reinsert the tape on the other side of the hemming. Lock stitch across the tape in the hem.

A stronger way is to use edge binding folded in half over the full outline of the keel. I do this by sewing the binding over the trailing edge first, trimming it off flush with the leading edge. Then I sew tape over the leading edge, leaving a three- to six-inch tag



reinforcing vents or holes



hanging off the lower end. I bend this back to form a sewn loop over itself about an inch or two long. It works as a good line attachment point. It helps to allow an extra inch of tape to extend into the kite structure at the base of the keel or fin to take wind pressure off the cloth. This method applied to large Parafoils, for example, has another advantage; in transferring sail loading to the edges, which won't stretch as much as the cloth, you help eliminate tipsy flight caused by fabric bias in the fins.

Load distribution can be most important if you're building large stressed-skin kites such as flares, Codys or large boxes. To prevent torn out pockets and worn out fabric on your kite corners and to allow for easy stick replacement, Pete Ianuzzi and other proficient kitemakers use tape loops at the corners of their kites. The tapes can be made from folded-over twill tape or strong shoelaces. Sewn into the corners of the kite, a few inches along the hem, leaving enough of a loop unstitched to accommodate the slotted end of a kite stick, the tapes don't get frayed or cut even when they crash onto pavement. For large kites and others for which you want to control skin stretch, the tape can be stitched across the cover from the corners and then stitched to a stick loop to distribute stress more evenly. As an alternative to loops, the stress tapes can be sewn into the kite cover (as far as 10 to 20% of the sail width). At the edge, the tapes can wrap over a metal ring and the slotted stick inserted into the ring.

It is probably obvious to the artists among us that these edging tapes can strengthen the kite not only physically but visually. Dark or black edge taping can separate the colors to give a stained-glass-window effect. You can deliberately select a wider dark edging

than you functionally need (up to two inches wide), just to really make the colors glow. (Be the first in your sky!)

the piecing route

Sewing sections of colored fabric together makes an attractive kite. Here are some of the mechanics:

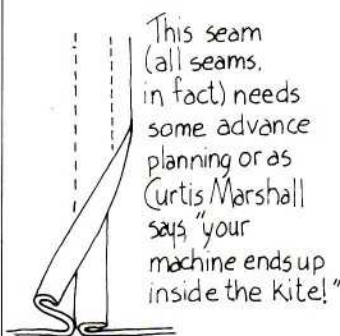
Start with simple stripes. (They can be extremely effective.) Run them across, up-and-down or obliquely slanted on your kite. Whatever the fabric grain, keep it symmetrical. Margaret Greger says that horizontal stripes seem to work better than vertical for lateral balance. Also you may safely mix fabric weights in horizontal stripes. Create your stripes by simply piecing together strips of fabric in colors you like. Almost any measure from 2 to 24 inches works, in uniform or varying widths. In effect, you're making new bolts of cloth from which to cut out your kite or kites. This is also an easy way to make large panels from smaller-width yardage for super cloud-busters.

A simple plain seam is fairly adequate and the face of the kite is neat, with no stitches showing. Sew straight stitches, eight per inch. You can strengthen this seam by running a second row of stitches on the back to secure the open edges. A lapped seam, with ¼- to ½-inch overlap, is neat if the flapping edges are sealed with a hot cut.

Now, the very finest and strongest seam of all, which every good sewing class teaches, is the Flat Fell seam. It is the strongest joiner as well as the most aerodynamic seam because there's no drag from loose edges fluttering around on your kite. Kites of the Four Winds and Cloud Pleasers make their delta kites using this seam. It is not so terribly hard to make. At the risk of repeating what you can find in any sewing book, we're describing it here:

Lay two pieces of rip-stop together (wrong sides together if your fabric has any front/back

THE FLAT FELL SEAM

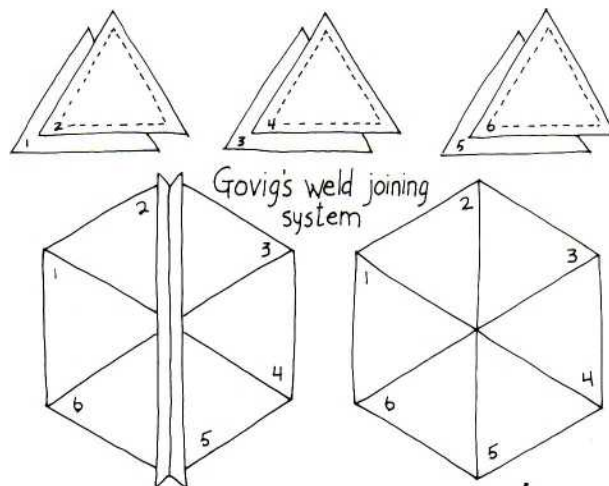


orientation). Offset the upper piece about ¼ inch from the edge of the bottom piece, which will project beyond. Fold the lower ¼-inch edge over the upper piece and sew with your basic eight stitches per inch. (Zigzag is easiest but straight stitch is stronger. That's always true, but especially here. However, zigzag's inherent stretchiness isn't much of a consideration unless you're building a really big kite.) Now, open the seam flat and fold the free edge over so the cut edges are hidden. Now run a second line of stitching close to the outside edge. You now have a flat, clean and classy seam.

Now that you have made this striped stuff, you can play all kinds of layout games with it and different kite patterns. Keep your kites symmetrical, of course.

Stripe yardage can be the basis for chevrons, diamonds, Bermuda-style pieced circles and more.

Mel Govig has a system for joining these that we can learn from. He takes two pieces of rip-stop of the same size—say, a yard by a bolt width. He then takes a long straightedge and his soldering iron cutter and makes four stripes (two pieces of fabric) by cutting through two pieces at once. This creates a heat-sealed edge. The heat seal is not strong but will hold the pieces together until they are sewn. Mel sews these seams by running a wide zigzag stitch right over the welded seam after spreading the



fabric flat. By using very light foot pressure and thread tension settings, he finds that the machine gathers the seam into a bead and "wraps" it into a very tight, strong, almost-flat abutted seam. (Try it on scraps.)

Mel is still discovering new applications for this heat-welding technique, which can be used on rip-stop as a new way of basting, to temporarily and quickly join fabric prior to setting a permanent seam. As an example, for larger kites and extra strength, a seam can be stitched about ¼-inch from a heat-welded edge, while the pieces are still together, then the material folded flat and sewn again alongside for a very strong seam.

Again, the heat-welded seam conveniently holds two modules in perfect alignment for you when you sew on load-bearing tapes as described before. If a panel has to be replaced or repaired, you rip the seam from the tapes on the side next to the damaged section. The welded seam inside can be easily pulled apart and the new or repaired panel sewn back in place.

ideas? did you say you need ideas?

Please indulge me while I go off on a tangent about color. Here's what I like: smashing, brassy, brilliant, electric, vibrant, sky-bustin' patterns of artistic genius you never knew you could do! But you can.

Some suggestions: Use high contrast—hot colors next to cools, bright ones next to black or white.

Consider the medium we're flying in: light to deep blue sky and white to gray clouds. Contrasting colors will show the kite vividly against that natural background. Consider unconventional combinations—green and red, purple and orange. Sound garish? You'd be surprised. In the sky they can look super! Don't always let your favorite colors prevail. Experiment! For impact, cut out the backs of your kites behind appliqued pieces to let the hues glow by themselves.

Black or a dark color surrounding a lighter color makes the kite look bigger and livelier. Even light blue or white are more brilliant this way. Concentric circles (like archery targets), or rainbow arrangements, composed of separate bands of color, will blend together in the sky. You can alternate these bands with black for a contrasting effect instead.

Socko colors may not be to your taste. You can go the opposite, quiet direction with rip-stop, too. Use white with pastels or subtle strokes of color for dreamy effects.

Here's something that hasn't been done yet, as far as I know: layering of colors in kite sails. You can work with loose pieces of cloth in various shapes and colors, moving them about and

taping them in place temporarily to find combinations that please you. Some will look good in reflected light as well as the more intended transmitted light. And you can put a white or light blue cover over the entire outside with the colors inside the sandwich. With .5- or .75-oz. cloth, there's very little weight penalty on this new pastel blending game.

To make the effect even more translucent, like a frosted window-pane, wipe petroleum jelly on a rag and rub it all over the cloth until the sail becomes translucent. With a little care, you'll get it even. Then rub off the excess. The result will be something you haven't seen before. And you can continue to experiment with color spots, cut-outs, silhouettes. (Think of a witch on a broomstick—completely concealed on the ground in reflected light but visible in the sky's transmitted light. Nobody's done it yet.)

Let me overgeneralize about kite decoration. Much as I admire finely detailed applique work, it looks great only if you're going to fly the kite no higher than the family room ceiling. It gets lost in the sky. If you want it to stand out in the air, use *simple* patterns, stripes, geometrics or bold free-form designs. The exceptions: more detail is dramatic if the kite is big enough (as we know from the Japanese). A strong design can hold busy elements together.

I have found simple borders to be striking. A single color will only look as good as its shape or contrast against the color of the sky at any particular moment. While this may in fact be quite beautiful, the mere addition of a black or contrasting edge can be very effective.

You can try out your ideas in advance without wasting expensive rip-stop by using coloring markers and plain white paper. Draw your kite in pencil, then make photocopies. Fill in colors and designs until you like what you see when you hold the paper up to the light.

Out of imagination? Look around you. Walk through a wall-paper or tile store, a linen department, a craft shop, a gift-wrap

department, an art museum (check Mondrian, Matisse, Magritte), a fabric store. Study advertising graphics. There's design every place you look. Let examples get you started, then modify to your taste.

Think you can't draw what you see? You know someone who can. Ask. Get friends involved. (I always say kites are people-magnets. And this goes for building them as well as flying them.)

One of the best ideas is to pirate designs from stained-glass pattern books. I just recently toured a book rack in a craft store and produced a King Tut, a toucan, an American eagle, sailing ships, antique cars, cherubs, airplanes and art deco abstract designs that are screaming to be colored in with rip-stop! Stained-glass designs correlate to kite possibilities because they are simplified yet exotic. You want the minimum number of parts to make the maximum recognizable design at your favorite flying altitude.

transferring a design

If you now have a pattern you like (say, a stained glass window design), don't be timid. You can enlarge it onto a kite. Those of you artists with access to graphics equipment are in luck. Others may find an opaque projector at a school or library. If you're able to beg or barter your way to using it, an opaque projector makes enlarging quite easy.

If you can't find a projector, don't give up. Go to the time-honored graph squares technique. Lots of books describe this, but we'll risk repetition and summarize it here. Draw a graph of evenly spaced lines over the original until the entire page is covered with squares. Then draw the same number of squares on a large piece of paper, as large as practical for the cloth you have. The squares can be any size as long as the quantity matches your original. Simply draw in, on your large paper, box by box, the design that's in each of the original's boxes. When you have roughly sketched your lines, use a wider felt-tip marker to blend the lines together smoothly. Then cut out the pieces and use them to make fabric parts.

The kite background can be either dark or light. Dark hues will give you an outlining effect around the design parts, like leaded glass, after you cut away the backing to let the light shine through. On the other hand, light values, particularly white, will let the color through without your needing to cut away the back. Using a solid white background is a good approach for a design with many colors or intricate shapes. Making the basic kite shape of one solid piece of fabric avoids the problems of seam weakness

and stretch differential of a pieced-together kite. (Rip-stop is such a lightweight cloth you rarely sacrifice much in weight.) In addition, the white background does not weaken or change the colors; often it intensifies hues, like ground-glass backgrounds do for transparencies or slides.

In laying out the pattern pieces for your kite, be sure to allow for hems on the pieces, if you plan to have them. (Zigzag stitching alone over appliques makes a flatter kite, but hemmed edges are slightly tidier. To hem appliques or not is your option.) Also make allowance for interrupting elements in the kite, such as keels, sticks, pockets, binding, etc. (You don't want your beautiful toucan, for example, to be suddenly narrowed visually by a sleeve stitched down its middle.) Where you have this kind of break, just split your pattern in a straight line over both sides of the hurdle.

Once you have the parts laid out, stick them down temporarily with tape (doubled-sided is easy). Then step back. Does the design look right from 10 to 20 feet away? If not, move the pieces like a jigsaw puzzle till it does.

attaching design pieces

There are various ways to "baste" or prepare pieces of fabric for stitching to your sail. You can glue-stick it, tape it or hot-tack it. (Some traditionalists use pinning but I don't recommend it when there are better ways.) To explain:

Margaret Greger says that glue-stick is the easiest method.

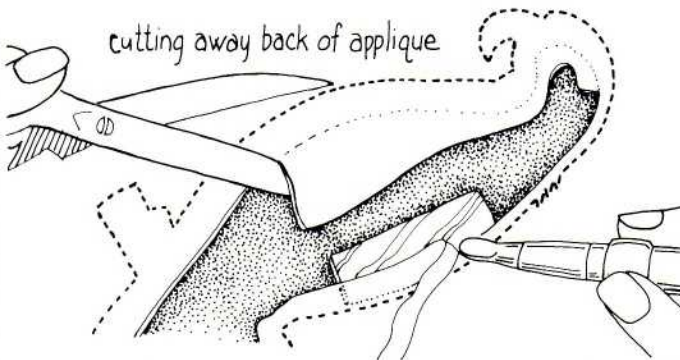
Lots of people use sticky tape, either the standard kind or double-sided. Standard tape works well if

position your pieces all you want. These sprays come from several makers (3M Photo Mount is the recommendation of Sky Zoo Kites) and are available in artists' supply stores. However, I have to be fair and warn you that they emit fumes, are flammable and tend to gum up needles. You may not find these drawbacks overriding. All adhesives (sticky tape, spray mount, crack-and-peel) share the gumminess characteristic.

Or, you can use a hot tacker (or spot tacker). It's a lot like a pencil soldering iron but has a finer point. The sailmaker's version has a built-in spring that releases the cloth neatly. The tool is, of course, designed for the purpose, but you could, with a light touch, use the sharp tip of a 25-watt pencil soldering iron.

To make an applied kite using a white background, draw your pattern directly on the white rip-stop, using a marking or lead pencil or (better) a marker in the same color as the fabric piece. Next, place colored rip-stop pattern pieces under the white base. The colored pieces will show through, with the advantage that you don't have to cut out the pattern pieces first. You hot-tack them in place by lightly touching around them, at half-inch intervals, with the sharp tip of a hot tacker. The hot-tacked points seal the fabric pieces together smoothly for easy handling when you (next) stitch right over the tack points.

Some suggestions for stitching applique pieces on a kite: Sew your parts down to the base fabric, preferably with a zigzag stitch, all around the edges, one piece at a time. Keep the base fabric flat as you go. Take it slowly and care-

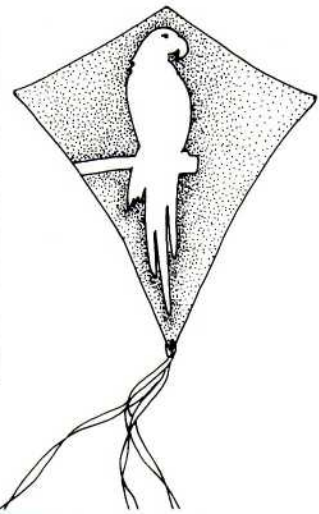


fully. With a little practice, you'll soon be a pro.

If you want to cut away the back of an applied kite, you can do it cold (with scissors) or hot (with a hot cutter). Leave the least amount of raw edge you can, 1/8-inch or less. How do you hot-cut without going through the applique? Roughly scissor out the back, leaving a one-inch edge. Then put a steel rule and/or curved metal edge under the fabric for back-up as you hot-cut—carefully! (The Dritz EZY Hem Gauge at about

you tear it off as you go through the needle. You can use double-sided tape under the edges of your kite pieces, making sure the wrinkles are out and not in the way of the stitching path before you sew around the edges. To help prevent gumming up your machine's needle, take a tip from sailmakers, who use 1/4-inch-wide tape.

Another sticking method uses artist's spray mounting adhesive, which seems like a wonderful idea because it gives a nonpermanent tack and you can pick up and re-



\$2.75 in fabric shops is a neat and useful aluminum rule, straight on one side and curved on the other. It can serve as a heat-resistant shield for hot cutting work.)

wash & wear kites

Rip-stop nylon is fairly easy to care for. You can wash it in warm water and hang it on a clothesline to dry. (Don't put it in a dryer.) Light surface dirt will come out, but deep soil and stains may not. Rip-stop will hold suds a long time so that in rinsing you may never get a clear rinse and spills or rain on the kite later will produce foam. Don't be alarmed; most kites don't seem to mind.

Can you iron the stuff? Yes, it's safe to use an iron set on the low, nylon setting. Don't use a wet cloth or steam as they will tend to stretch the fabric. Margaret Greger uses a tissue paper press cloth. Be careful ironing and rest on a corner when increasing ironing heat because if it's too hot it will cause puckers that are well-nigh impossible to get out afterwards. Puckering is more apt to happen with lighter weight rip-stops than with heavier ones. The best way to straighten rip-stop (for instance, when it comes mashed off a bolt) is to give it a bath in warm clear water and hang it to dry over a straight rod. (Thanks to Cloud Pleasers for this helpful tip.) Of course, no matter how sleek the kite looks brand new from your workshop, it will soon get wrinkled when you roll it up and bag or rubber-band it. (Margaret Greger makes flat bags about ten inches wide, muumuu-like for kite comfort.) Most of the wrinkling

will straighten out with flying.

Sometimes you will find bargain nylons that are soiled or wrinkled on a balloon- or sailmaker's cutting room floor. You can salvage them and pay perhaps no more than your washing or ironing labor.

There are other forms of wear on nylon, such as degradation of colors and cracking caused by sunlight after many hours of flight. An old, much-flown Parafoil will look all cracked, like a dried-out apple, but will usually fly just as well as ever. Sand is abrasive on kite covers that frequent the beach. Rip-stop is not forever, but it's relatively more enduring than, say, *washi*, the Japanese rice paper used on kites which are rarely flown a second time. I've yet to see rip-stop ritually burned at the beach after flight.

the rewards

None of these techniques are easy the first time, but they are a lot simpler than they sound. (They are easier to do than write about, let me tell you!) With practice, though, they become easier. You grow facile in the art of translating from kite-seen-on-paper to living-fabric-kite.

We've all learned there's nothing like answering a thrilled spectator's compliment with:

"Thanks, I made it myself."

BILL TYRRELL is a well-known, well-liked big kite man (adjective applies doubly) whose varied talents have been expended in numerous trades in the Philadelphia area. Formerly involved in the manufacture of soft kites, he is now the steam that keeps The Fabric Lady going.

acknowledgments

My heartfelt thanks go to the super people who helped (in lots of ways) to bring this learning-for-fun tool to print. I simply couldn't have written it alone.

First, I thank Mel Govig for his constant flow of technical input. Others who lent me important knowledge support are Louise Crowley, Tony Cyphert, the Edmonds Community College of Lynnwood, WA (in the persons of Harry Osborne and Paul Doherty), Judith Faecher, Doris Fithian, Fran and Mary Gramkowski (High Fly Kite Co.), Ed Grauel, Pete Ianuzzi, Jeannette Kehl, Bruce and Carolyn Kennington (Cloud Pleasers), Marty Lowell (Skyzoo Kites), Curtis and Gray Marshall, Cathy Pasquale, Robert Sessions (Hood Sails), Tal Streeter, Sallie and Nick Van Sant (Kites of the Four Winds) and especially Rita Siravo, who first encouraged me to sew ("Every man should know how to sew").

Special thanks go to Annie for sharing her machine and her spirit

and to Babs for typing and caring.

Finally, I suspect that more than a few spouses will know what I mean when I save my greatest appreciation for my wife Mary for enduring a lot of disruption while helping me keep my feet on the ground when I have my head in the clouds.

Last I thank Val Govig for two things. First for her added vitamins of information and tough editing work to make this whole article usable. Second (and I insisted she include this) for her dedication to *Kite Lines* as a communicative tool that helps us all know each other.

Though it's a big collective article, all of us feel strongly that it is just a start on the subject of kitemaking with nylon. Do you have sewing, materials, procedures and design tips you'd like to share? Just write to *Kite Lines* or to me in the shipping and communications department at The Fabric Lady. There's more to come.

—Bill Tyrrell

source list

At the top of any kiter's source list is *always your local kite shop*. The better storekeepers realize that encouraging kitemaking doesn't lose sales for kites but gains sales for materials and keeps people interested in kites.

A pioneer in this philosophy is The Kite Site in Georgetown, DC. If your local sources are short of what you need, then try mail order through such companies as The Kite Site, The Fabric Lady and others up-and-coming in the business.

The following are suggestions for finding some of the more specialized items mentioned in the article. We have not listed manufacturers (i.e., for rip-stop) because they require minimum quantity orders that are normally far beyond the individual kitemaker's needs.

All prices given are approximate and subject to change.

Item	Price Range	Source
first-quality rip-stop, 1.5- and .75-oz.	\$4.50-\$5.50/yd.	The Kite Site
nylon seconds and close-outs, many weights	\$1-\$2.50/yd.	The Fabric Lady
balloon cloth:		
remnants	\$5/lb.	The Fabric Lady
roll seconds	\$1.50-\$2.50/yd.	The Fabric Lady
remnants	\$4/lb.	John Parker
yardage	\$4-\$7/yd.	balloon manufacturers
nylon taffeta	\$2-\$4.50/yd.	local fabric stores, The Fabric Lady, Frostline
pencil soldering iron	\$7-\$25	electronics stores (such as Radio Shack)
wood-burning knife	\$19	toy and craft stores (such as Tandy)
sailmakers' hot cutters and spot (hot) tackers	\$35 \$25	The Fabric Lady or sailmakers' suppliers
marking pencil	\$.90	} all at local fabric stores
tailor's chalk	\$1	
seam ripper	\$1	
thread clipper	\$1.50	
pattern-making paper	\$1.50/yd.	
needles:		
domestic	4/\$1.25	sewing machine supply companies
industrial	\$11-\$55/100	
thread:		
Gutermann button (polyester)	\$.90/220 yds.	local fabric stores
30-, 40- or 50-denier polyester or nylon	\$10-\$15/lb.	sailmakers' or tailors' supply companies
parachute Grade B military	\$6 1/2-lb. spool	The Fabric Lady
"roller" foot, edge binder, folder attachments	\$1.50-\$10 or \$100-\$150 custom made	sewing machine supply companies or The Fabric Lady
edge binding tapes and bias tapes	\$.06-\$25/yd.	local fabric stores, The Fabric Lady, Frostline
adhesive-back rip-stop: tape, 2" wide	\$.25/ft.	The Kite Site, The Fabric Lady
yardage, 42" wide	\$7/yd.	The Fabric Lady
nylon webbing, 1/2"-2" wide	\$.15-\$1.50/yd.	The Kite Site, The Fabric Lady, fabric or camping goods stores, Frostline
grommet-setting tools and grommets (various sizes and assortments)	\$5-\$10	local hardware or fabric stores or Frostline
sticky tapes, Tacky Fingers, artists' spray mount, markers and refill inks	variable, inexpensive	local stationery and commercial art supply stores
sewing books, Dover books and others on sewing and design	\$1 to \$5 Dover	local library; book, sewing, art, craft stores; Dover Publications

KEY ADDRESSES (write for catalogs)

The Kite Site, 3101 M Street, N.W., Georgetown, DC 20007.
 The Fabric Lady, 51 Layle Lane, Doylestown, PA 18901.
 John Parker (serving kite club members, nonprofit, FOB Charlotte), 6109 Rosecrest Drive, Charlotte, NC 28210.
 Frostline (Fabric Line catalog), Frostline Circle, Denver, CO 80241.
 Dover Publications, Inc., 180 Varick Street, New York, NY 10014.

two masters of nylon: the Marshalls — father and son

by Valerie Govig



Theodore L. Manekin



Theodore L. Manekin

Tour de force kites by the Marshalls include Curtis's 23½-foot wingspan M-12 (top) and Gray's radiating rainbow Flexifoil, as flown in Nags Head, NC, in 1978. At far left is Curt in a typical stance.

Curtis Marshall lives in a large home (seven bedrooms, one of them for kites), has a large family (four sons and one daughter), maintains a large office and medical practice as an electroencephalographer—and makes large kites. His kites are not only large, they are engineered to the highest standards and designed for novelty and beauty.

One is easily intimidated by the Marshalls. The sight of them on the field with their modified Parafoils and Flexifoils and their original delta-Conynes, each with its own carrying bag, is enough to strike fear into any competing kiter. But having known Curt for a long time, I can speak for the warmth and humor of this gentleman of kites. He has rendered many

quiet services to the Maryland Kite Society, to *Kite Lines* and to individual kites.

But perhaps his most important service has been sharing his talents with his children, particularly Graham (called Gray), now 21, who is a formidable kite artist/technician in his own right. For certain kites, Gray works completely alone. His latest kite is a 100-square-foot Parafoil

with graduated color effect (see this issue's cover). It's the result of much experience, going back to his first exposure to kites in 1972.

Curt had bought a J-7.5 Parafoil and tried it out on a vacation. "I couldn't believe the damn thing would fly," he says. Fascinated, he and Gray tried to make their own. Fourteen models later, they got one that worked. Hooked by now, they began to analyze what features made *winning* kites. Bright colors and large sizes in deltas and box kites seemed to be winning then (about 1975). It was Gray's concept that they *combine* these features—deliberately *design* kites to compete. Curt began calculating wing areas against weight and hit upon the combination of a delta-Conyne with a forward swept trailing edge. This design also fulfilled a desire to keep all the struts the same length. As the design evolved, cut-away cells were used to increase lift. A series of Marshall delta-Conynes was started. Models were called the M-9 and the M-12, the numbers standing for chord length in feet.

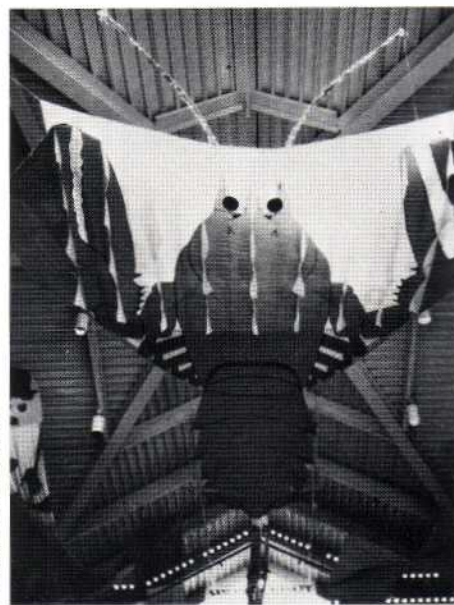
Certain construction details of the Marshall kites are innovative: ball-and-socket joints hold the spreader bar in place by wind pressure; three-part break-downs make for interchangeability of frame parts (permitting the center third to be replaced with a stronger segment for heavier winds); and retaining plugs at the wing tips are held by cords that control surface tension. All the parts are machined of aluminum and nylon in the fully equipped basement machine shop. Upstairs, the stitching goes on at the three sewing machines. Curt has been sewing since he was 11 years old and thinks nothing of doing kites.

The prodigious Marshall output includes pieced rip-stop nylon kites decorated with (for example) a rose, a Christmas tree, stars and stripes and bold geometrics. The collection also includes occasional commercial kites with logos reproduced accurately in mammoth size. Also in the series are some kites made of Marimekko cottons printed in striking graphics.

The Marshalls certainly succeeded in making kites to win. However, not all their experiences at competitions have been happy ones. At the 1976 Smithsonian, Gray collected more points than any other entry, but was under 16 and ineligible for the top award. Another year, the Baltimore Evening Magazine television show followed Gray to the Smithsonian, only to have him fly a glorious dud, a large, experimental low-aspect-ratio Marconi-type kite that repeatedly dove to the ground. It seemed the Fates were test-

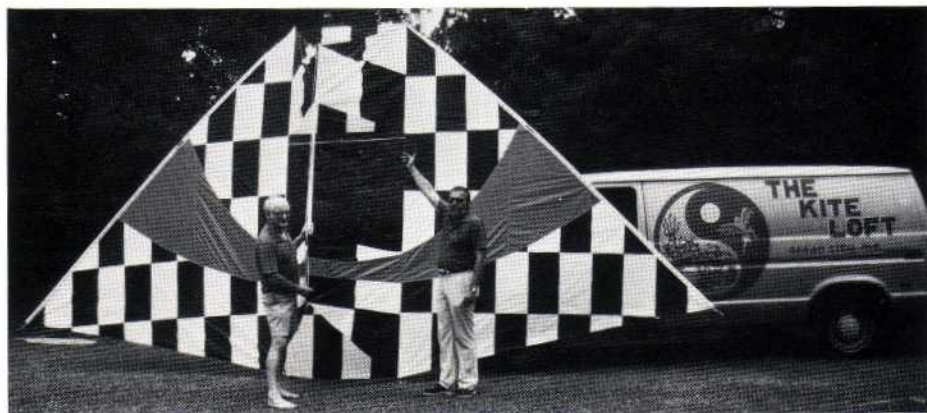


Theodore L. Manekin

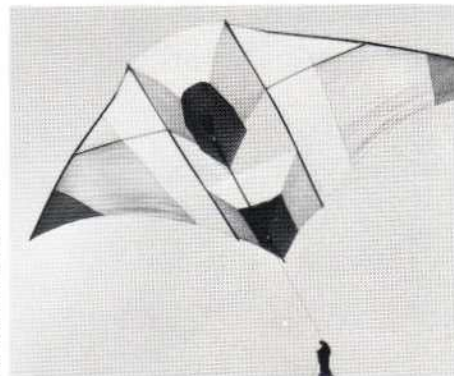


Felix Cartagena

Above left, Curtis Marshall maneuvers his Flame, a Flexifoil derivative, at Ft. McHenry, Baltimore. Right is his lobster Parafoil on display in Baltimore's Harborplace. Below, counterclockwise: an M-12 in black-and-white checks and red crescent made as a "stop sign" for a kite shop; Gray Marshall offers a kite ride to his sister, Shanna; the advantages of flying in Baltimore's harbor; the disadvantages of same; experimental delta-Conynes—a multicell of 1974 and a "standard" of 1976.



Theodore L. Manekin



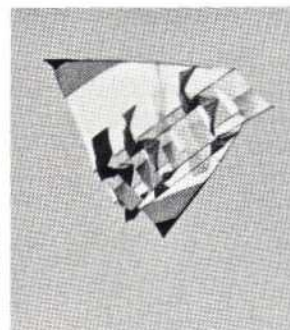
Bill Kocher



Bill Kocher



Bill Kocher



Anneke Davis

ing Gray's character. The last two years have proven more rewarding for both father and son. The two have taken the family award (one of the Smithsonian's nicest ideas) each year, along with trophies at many other major events.

The Marshalls keep careful files and records on all their kites "so as not to make the same mistake twice." They are always experimenting. About three years ago, Curtis tested a Flexifoil for a review in *Kite Lines*. It became a model for making several more, some which worked and some which didn't. Gray made a Flexifoil in a rainbow-ray format that performed beautifully. And Curt has done variations on the design such as his hammerhead shark and an abstract he calls the Flame.

Curtis's most heroic project must be his lobster Parafoil, which consumed 300 hours of time from start to finish. Curt used Gray's Parafoil templates for the lobster but planned the fabric sections, tail plates and antennae to be

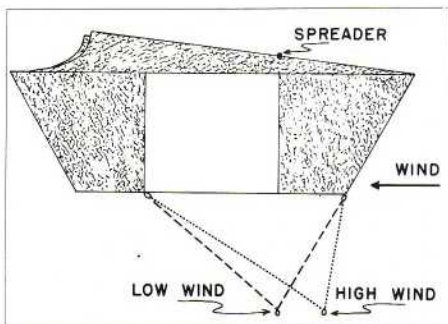
anatomically correct in every detail—not to mention fiercely lifelike in motion.

Curtis and Gray are not the only Marshalls involved in kiting. Meg, Curt's wife, very much the lady but a modern and witty one, cares and carries. She calls herself "the caterer" (and occasionally brings out the champagne), but asserts that kites are "a real plus in our lives." Young Shanna, age 11, has been making kites since she was 6 and hasn't yet crumpled under the high expectations of being a Marshall.

Gray is presently a student at George Washington University in Washington, DC, and his interest in kites remains intense. He talks of getting a student team together to build a Hamamatsu style kite in modern materials.

Curt, too, says, "I'd rather talk about what I'm *going* to do," and starts dropping ideas for kite games at night that he wants to try. As the Marshall files keep growing, Maryland area kites can be sure that the skies will never be predictable.

addendum: alternate bridle kiteflying



Example of two independent alternate bridles for testing/flying a delta-Conyne kite (side view).

By Curtis and Gray Marshall

A technique which we have found to be a lifesaver in the flying of large kites is apparently not widely applied. Although we dreamed it up, it's likely others have hit on the same practical idea in the past.

In flying first our M-9 delta-Conynes (83 square feet) and then our M-12s (148 square feet), we were often worried when winds gusted to 20 m.p.h. To protect both the kite and the kitefliers, we tried to rig for maximum expected wind speed, but this left much to be desired, as the kite often came down between gusts.

A two-minute brainstorming session gave birth to the next natural step, which was to rig double and fly with two completely separate bridles and two lines alternately—a red line for low winds and a white one for high winds. In other words, "Grab the white one when in trouble!" In our work with the M-12, we had the low wind bridle arranged to tilt the kite

at a steep angle with maximum drag and maximum lift; the high wind bridle was arranged for a flat angle with little drag and little lift. One flier on each line could make it nice and easy—lift the kite on a high wind bridle, shift to the steep angle bridle for a test period, and then go back to the flat angle of attack for landing.

This concept worked so well that we decided to expand the application and found that it worked out admirably for the problems encountered when one is attempting to compare two different bridle lengths, two different bridle points, single point versus double or triple bridling points, and so on.

Our old method of comparing two bridle geometries was to try them alternately—of course, landing the kite in between. The process was slow and the winds kept changing. Next we tried two identical kites flown simultaneously but carrying different bridles; this meant building two kites before we were even satisfied with one. Use of alternate bridles circumvents these problems.

We have found the alternate bridling technique quite attractive in "tuning" even kites with bridles as complex as those of the Jalbert Parafoil. It is obvious, then, that the concept could be expanded to compare more than two bridle geometries on one flight, but the use of more than two flying lines on one kite presents unnecessary opportunity for trouble, and trouble is just exactly what we were trying to avoid in the first place. ♦

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for BIG compass kites

By Wayne M. Schmidt

One of the frustrating problems in design of medium or large kites is trying to draw a big circle or arc. To solve this problem, I worked out the following design for a large compass that can cost as little as 50¢.

To make the compass, I used yardsticks because they are free from many hardware stores. Even if you have to purchase them, they are only about 25¢ apiece, which is a good price for a straight-grained piece of wood this size. Certainly, if necessary, you can substitute wood strips from a lumber yard. In any case, the materials for the compass will be inexpensive. And the time investment isn't bad, either—just one or two hours.

TOOLS

Coping saw, drill.

MATERIALS

Three wooden yardsticks.
 Three ¼" bolts ½" long.
 Six washers.
 One wingnut. Two locknuts.
 One felt-tip pen. One large nail.

INSTRUCTIONS

1. Drill ¼" holes at the 1" and 18" points on two of the yardsticks. Use a bolt and locknut and two washers to join the sticks through the holes at the 1" marks. These



Wayne Schmidt's outside compass was indispensable in the design of his eight-foot Guatemalan-style kite, constructed of 203 pieces of polyester fabric. "It flies like a dream," says Wayne. For transportation, it folds down to a 41x31" cylinder. Assembly time at the field is about one minute.

are the arms of the compass.

2. Drill three ¼" holes in the third yardstick at the 1", 3" and 35" marks. Using a coping saw, cut a ¼" slot from the hole at the 3" mark to the one at the 35" mark.
3. Join one side of the slotted stick to one arm by bolting through the slot to the remaining hole in the arm. Use the wingnut for this. Bolt the other end of the slotted stick through the hole at the 1" mark to the second arm's remaining hole. The washers should be on the outside of the sticks.
4. To complete the compass, use some tape to mount the pen and nail to each arm, at the lower inside edge, so that these points extend about 1½" beyond the end of the sticks.
5. Finally, adjust the locknuts so that when the wingnut is loose the arms can be opened and closed easily but so that when the wingnut is tightened there is no "play."

USING THE COMPASS

Set the radius by spreading the arms to the desired distance and tightening the wingnut. This compass will draw circles up to 11 feet in diameter. I've found it to be one of those things that is needed only occasionally, but when it is needed, it is indispensable. ◇

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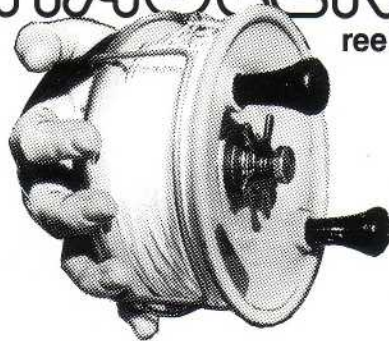
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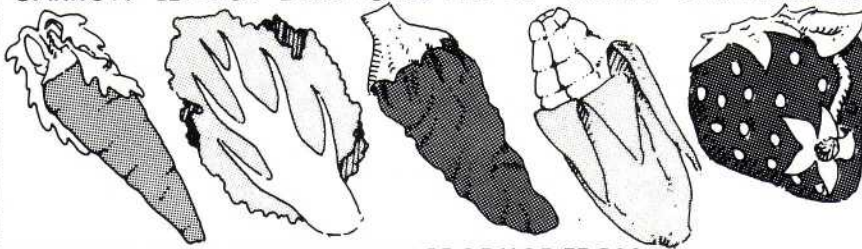
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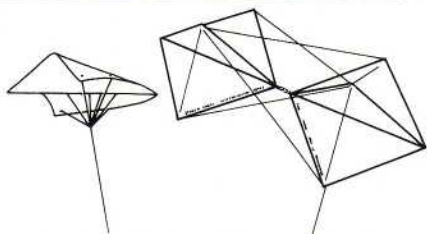
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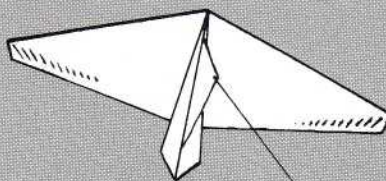
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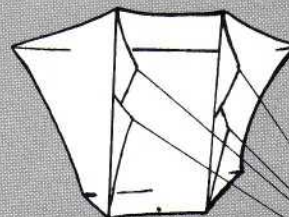
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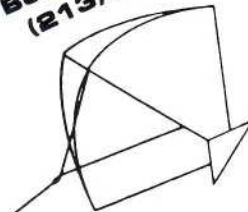


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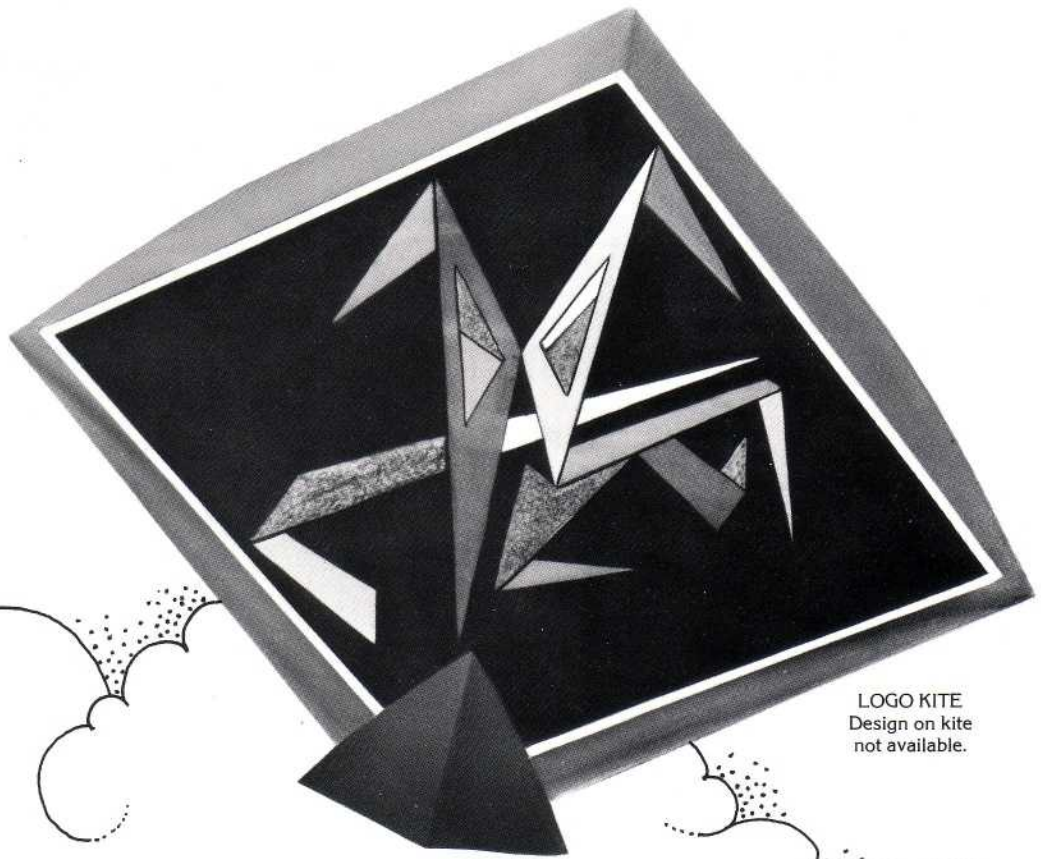
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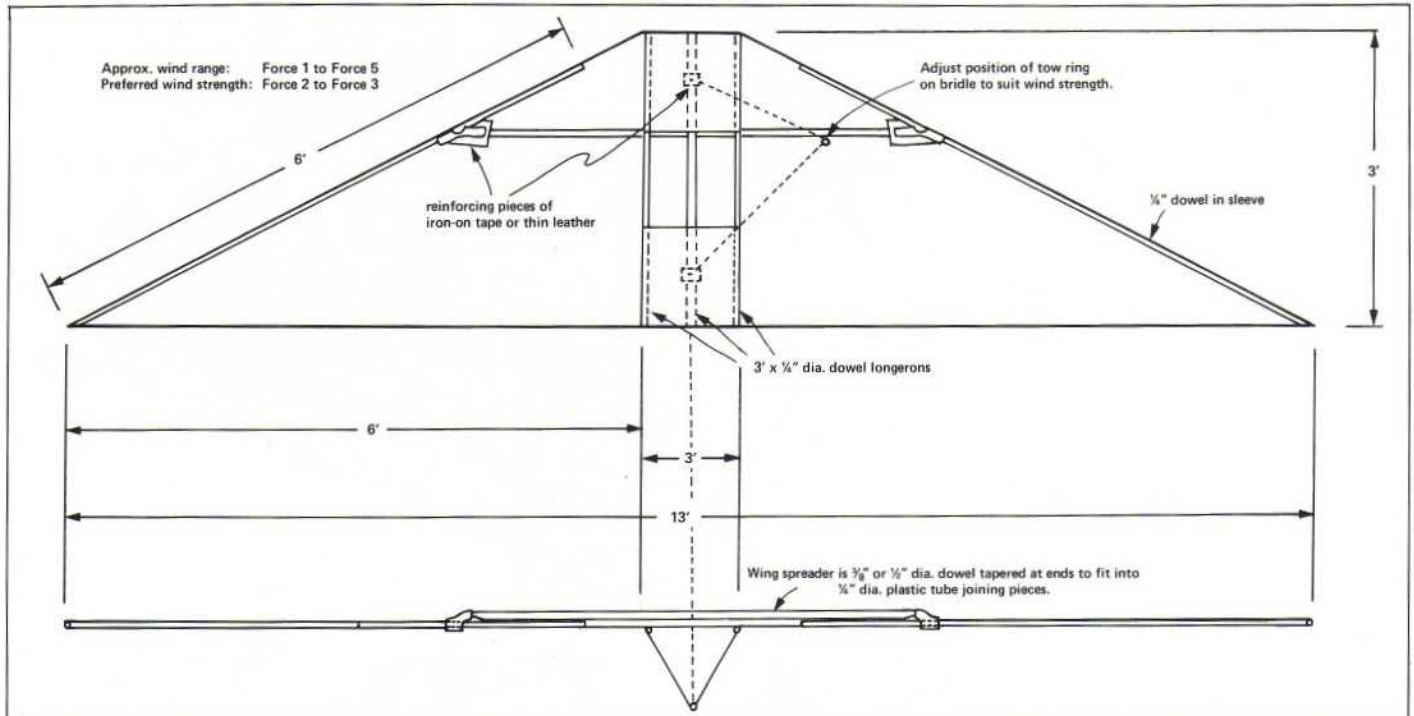
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John White's **HARDEC** (High-Aspect-Ratio Delta-Conyne)

The delta-Conyne has been the independent discovery/development of several kites.* Curtis and Gray Marshall's design has appeared in the newsletters of the San Francisco Bay Area Kite Flyer and the AKA News. Less well-known, perhaps, is this interesting version by John White.—Ed.

This kite first flew early in 1978, being a much widened version of my standard delta-Conyne developed the previous year. The prototype was ripped to pieces (who says rip-stop won't rip?) and while it was being dragged out of a tree every "bone" in its body was broken. However, upon



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repair, it flew just as well as before.

For the 1979 Merton Kite Festival at Mitchum Common on the southern outskirts of London, I constructed a three-times scale-up of it using 9-foot-long 3/4-inch dia. dowels joined by duralumin tubes for the spars and singly for the three longerons. The wing spreader this time was made from two 7 1/2-foot lengths of a 1 1/2-inch dia. dowel joined by a dural tube and reinforced with a 9-foot length of 3/4-inch dia. dowel bound across the middle with plenty of sticky parcel tape every time the kite is assembled.

This kite won a prize on its maiden flight. It should have come out at 39-foot span, but (no doubt due to my over-generous cutting out) was found by one of the judges to measure 41 feet 10 inches across. In October, 1979, it flew steadily for four hours on its 200 meters of 950-lb. test nylon cord at the Old Warden Kite Festival and has since made appearances at Dieppe in 1980 (where it wrapped itself ignominiously around a lamp post, breaking two dowel sticks) and at the First Croydon Kite Festival in June, 1981.

I find Hardec's graceful, slow-moving kites that need hardly any more wind than a "pure" delta. I have yet to make a middle size version (i.e., 6' x 26').

*Documented in "You Ask, What is Delta?" Kite Lines, Winter-Spring 1981.

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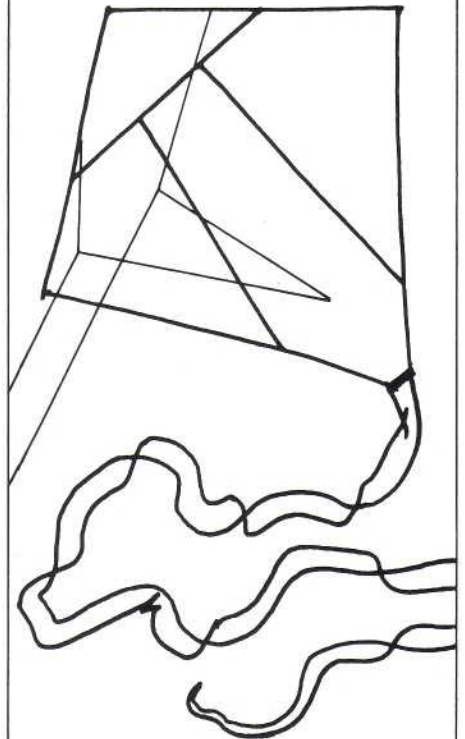


The complete file of back issues of *Kite Tales* (predecessor of *Kite Lines*) is now available on microfilm. Included are all 40

issues in 49 microfiche jackets representing a total of approximately 1600 pages, from the first issue, October 1964, to the last, November 1976. Kite plans, profiles, commentary, news—original resource material available nowhere else. A must for researchers, collectors and historic libraries. Microfiche may be read in almost any library and selected paper copies made for individual study by using certain copiers. Only \$2.50 an issue on microfiche, \$85 for the entire set. No paper copies available from microfilm and no single pages available on paper or microfilm. Now offered through a royalty agreement with Robert M. Ingraham, the editor-founder. Send check or money order to Aeolus Press, Inc., 7106 Campfield Road, Baltimore, MD 21207, USA. U.S. orders are postpaid; foreign orders must be in U.S. dollars on a U.S. bank and should add estimated postage. (Full set of microfiche weighs 7 1/2 oz.; one issue weighs under 1 oz.)

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For the Record

This department is devoted to reports of record-setting achievements with kites. News will appear from time to time, as it arrives, in Kite Lines. Publication of a report is not to be construed necessarily as official recognition by Kite Lines or any other party of any attempt at a record.

New World Record for Largest Kite Is Set at Scheveningen, Holland!

The following news was received by Kite Lines from Gerard van der Loo, The Hague:

On August 8th, 1981, at 15.45 hours (3:45 p.m.), a Dutch group of kitefliers broke the Guinness record in flying the world's largest kite at Scheveningen beach, The Netherlands.

At 3 o'clock, when everything was ready for launching the kite, there were about 10,000 people to watch. The team of 70 people launched the kite twice with no luck, but the third time it flew perfectly in a gentle wind for 37 minutes. The ten makers of the giant kite decided to bring the kite down and the kite, after inspection, was still in perfect condition.

We have the intention to fly the kite in other countries also. We have been invited to fly it on the 10th of October, 1982, in a large festival near Bristol, England, and we hope to be invited to come to the USA to fly the kite.

Specifications on the kite, supplied by Gerard van der Loo and Maarten Wijsman and confirmed by newspaper accounts, are as follows:

Name of kite:	CS 550m ²
Type of kite:	inflatable airfoil (new design)
Quantity of air intakes:	2
Dimensions:	32 x 16.5 x 2.4 meters (105 x 54 x 7.8 ft.)
Surface area:	553 square meters (1,1814.3 ft.)
Capacity:	About 1 million liters
Weight:	230 kg (448 lbs.)
Materials:	rip-stop nylon, 2500 meters (2734 yds.)
Quantity of bridles:	10
Windspeed to fly:	3-6 meters/sec. (6-12 m.p.h.)
Pull:	2-3 x 10 ³ kg (4400-7000 lbs.)

Further background information from Gerard van der Loo on the "CS" kite:

Directly after our last year's failure to launch the world's biggest kite of 315 square meters area, the launching crew decided to create an improved version of this enormous kite. Building a kite seems to be a relaxing hobby, but as soon as a week's calculations are needed for just one shape of the wings and testing models have to be made and tested for weeks under extreme circumstances, it seems to be more a NASA-like project than a relaxing hobby!

The conditions we wanted the world's biggest kite to fulfill were the following:



- No framework inside the kite—so a completely flexible one.

- At least twice the size of the famous world record kite of 266 square meters area flown in Shirone, Japan, March, 1980.

- The pull minimized, so the kite could be launched without enormous equipment.

- Few bridles, so the trimming could be minimized.

- A low weight (but the kite had to be strong, so it could be flown more than once).

- Relatively easy to launch.

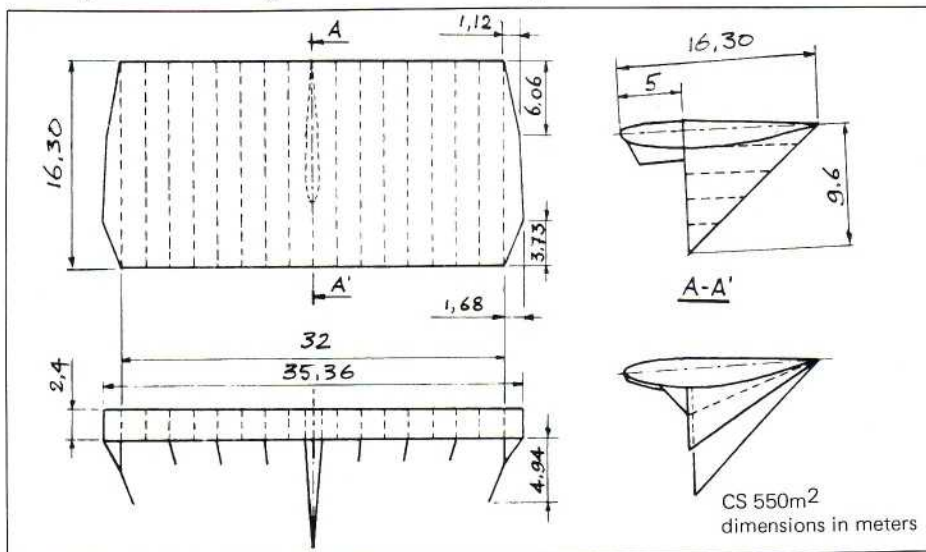
The testing model fulfilled all these conditions and a complete new model was created.

This project, in which almost 3000 hours were invested, was realized by the following ten persons: Han Brandenburg, Marlies van Dulleman, Cees van Hengel, Gerard van der Loo, Bert van Nierop, Ben van Roon, Wilma Stam, Gijsbert van Seumeren, Harm van Veen and Maarten Wijsman. Maarten Wijsman made the drawing of the kite design for *Kite Lines*.



A new world's largest kite is flown on the beach at Scheveningen, top. Below are some of the hundreds involved in the launch.

Reaction to the news from Holland was immediate from the Edmonds Community College Kite Team in Lynnwood, WA. This team had captured the record from Japan in October, 1980, with a Parafoil said to be 3,640 square feet in area. The ECC Kite Team has announced that it will try for a new record in the spring of 1982. Meantime, rumor has it that the Shirone Kite Association in Japan has new plans afoot, too.



Long Tails—A Long Tale

The first official holder of the world record for longest kite and tail, Richard de Santis, flew a 500-foot "dragon" kite at Venice, CA, on March 22, 1980. His effort was the target for a rash of challenges in 1981. One of the first was that of Bill Kocher of the Maryland Kite Society. Bill flew a 580-footer at Fort McHenry, Baltimore, on March 22. It was witnessed by seven people and documented.

But it turned out to be (relatively) a short kite—and a short-lived one in the record books, too, because on May 3 at the Bucks County Kite Fly (PA), Scott Spencer of New Jersey flew a 1,022-foot nylon dragon for 9 minutes 37 seconds. A large crowd, several newsletters and other documentation all bore witness to the achievement. Scott is now working on making an improved kite.

Unknown to him was the flight on April 29, 1981, of a 1,250-foot dragon by Tom Henry at Marina Green in San Francisco, CA. The attempt was mentioned in *Kite Flyer: Bay Area News*, a

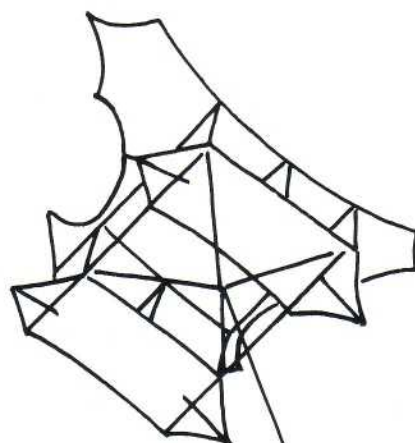
reputable source, but no further corroboration has been received.

At the Scheveningen (Holland) kite festival in June, a longest kite contender flew and was said to measure about 1300 feet—but again without documentation.

All these efforts were in turn eclipsed by the kite designed and flown by Randy Joe and many friends in and around the Sunshine Kite Co. in Redondo Beach, CA. Helped in the making of the kite by Frank Alonso of Spectra Star Kites, the crew of 25-some people made two attempts and on the second flight the entire 1500-foot snake was in the air for a 3-4 minute period. The winds were light that day, November 7, 1981, and another flight of longer duration will be made early in 1982. (The duration requirement suggested by Robert S. Price in a previous *Kite Lines* has come into question in this connection and comments with a revised consensus will be reported in our next issue.) Randy Joe's effort is provisionally the new Longest Kite record, pending a somewhat longer flight. ◇

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STATESIDE

News From Here and There

COLORADO

Jim Glass writes from Boulder:

The Second Annual Father's Day Kite Festival attracted 2500 participants from the Denver metro area. Sponsored by the Boulder Parks and Recreation Department, KBCO/KADE Radio and Into the Wind, Boulder's kite store, the festival introduced many to the joys of mountain kiteflying at Chautauqua Park. The site is located in the Front Range of the Rocky Mountains, nestled against the Flatirons. It gives a spectacular view of Boulder Valley—a great place to fly kites!

The wind was somewhat challenging but hundreds of kites proved equal to the task. Delta-Conynes (of Curtis Marshall and Hod Taylor design), rollers, octagons, dragons, multiflares and numerous deltas, with wingspans from two to twenty feet, soared aloft on the gentle breezes.

A stunning Hawaiian *Ao Manu* (Cloud Bird) by George Peters of Honolulu took to the air like a native, enchanting everyone with its multifaceted colors. Brian

and Sarah Volkman of Denver's Mile High Kite Works captured the prize for largest kite with their 12-foot Waldof-type box kite. Carolyn McCullough flew the smallest: dragonfly wings with a grass tail! The Grand Prize winner was an incredible J-30 Parafoil made in a Madras design of overlapping colors by Karin Verschoor. One of Denver's premier kitemakers, Karin can always be counted upon to put a new kite into the air at local kiteflies and as far away as the Arctic Circle.

MICHIGAN

May 9th saw an excellent turnout at the Third Annual Kite Contest and Clinic at Imerman Memorial Park, Saginaw, MI.

Light winds didn't deter enthusiasts, who seem to be increasing in the area.

"Next year's event will be held around the second or third Saturday in May," said Sandy Langworthy, coordinator for one of the sponsors, WEYI-TV. "If your readers should have any suggestions for next, we'd be happy to hear from you."

NEW YORK

G. William Tyrrell, Jr., reports from a trip to New York City:

Six-to-eight-knot breezes greeted the 100 or so protesting kitefliers on this Sunday, August 23rd, 1981. The near-perfect weather spoke well of the Brooklyn

Larry Cuttitta flies to video fame in Brooklyn.

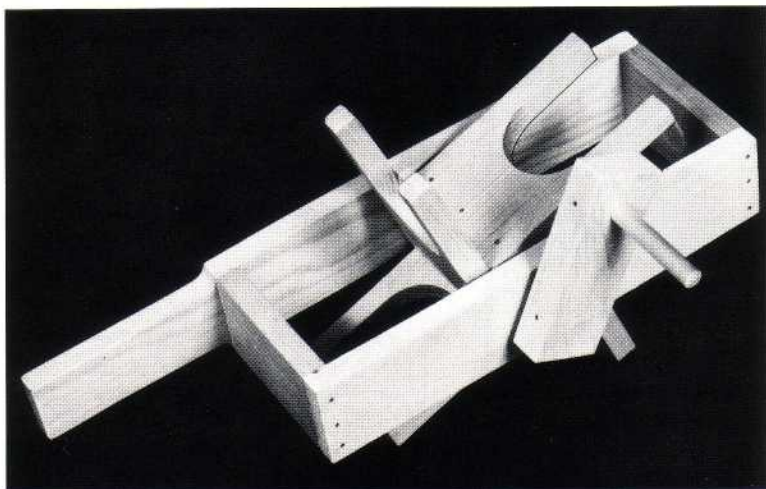


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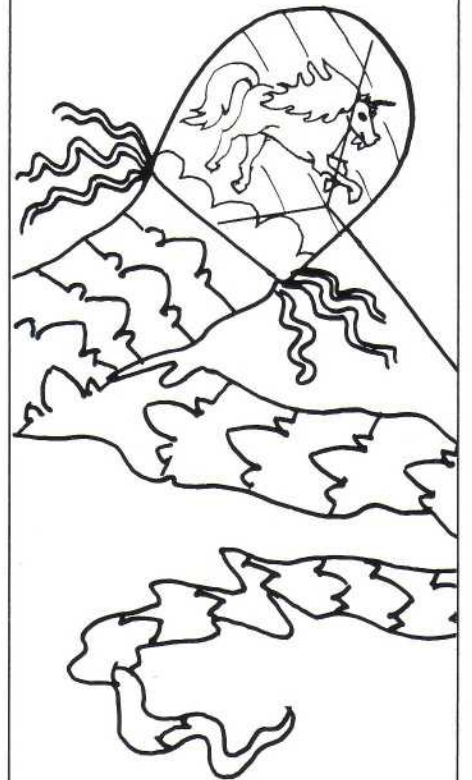
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News From Here & There

...Continued from page 44

Kite Club's intention to dramatize their fight with "city hall."

All opposing forces were set in motion on July 26 by a New York police helicopter pilot and Larry Cuttitta of Brooklyn. The chopper pilot's case was that Mr. Cuttitta's kiteflying was endangering *his* flying. One ticket later, Larry was summoned to court to answer charges of breaking what were said to be Federal Aviation Administration regulations against flying a kite over 1000 feet in altitude. Larry found that the FAA regs applied only to kites over five pounds.

To gain public support for their cause, Cuttitta, Carmine Santa Maria, Arthur DeLeva and other fliers instantly formed the 31-member Brooklyn Kite Club. Santa Maria, an activist in noise abatement work, expertly aroused a media blitz to accompany a kiteflying demonstration in the Bay Eighth Street Park, between the Verrazano Narrows Bridge (900 feet high) and the Veterans Hospital (about 400 feet high) in Brooklyn. Two TV stations and seven newspapers showed up.

The outcome of the hearing, as reported in papers across the nation: case thrown

out of court ("for the birds," the sympathetic judge said). Defendant Cuttitta, with his kite rolled up at his side, was applauded in the crowded courtroom, where he was heard between a robbery case and a rape case. Judge Becker said that kiteflying was "one of the few permissible and legal means of getting high in New York City without breaking the law." He confirmed that any kite under five pounds can fly to any height in New York City. It was probably the most dramatic hour for kiting in New York since Will Yolen was arrested for flying a "Lindsay for Mayor" kite in 1963. (Later Yolen's flying was the focus for getting the ban repealed.)

NEW JERSEY

The shadow of it was like that of a major cloud. It was a 3,200-square-foot American flag flying 200 feet above the beach at Brigantine, NJ, lofted by a Parafoil on two different weekends in September. The first occasion was recorded on the Philadelphia Evening Magazine TV show and the second hit the newspapers. The name Bill Tyrrell was becoming almost a household word.

Weeks before, Bill had made the stripes while Mel Govig made the stars and then



Donna Connor

Bill Tyrrell wrestles with his 45 x 75-foot flag, representing about 400 yards of rip-stop nylon, 300 hours of planning and construction work and a mile of machine stitching.

the two of them put the monster together in a high school gymnasium, where the flag covered the basketball court.

With no guarantee it would work, Bill headed to the beach, tied his line to a pier and saw the kite and flag rise into the sky. Several spectators from the Greater Delaware Valley Kite Society were there and someone started singing the Star Spangled Banner. Everyone joined in and "there wasn't a dry eye in the place," according to Mel Govig, whose voice goes a bit husky every time he tells the story.

The flag may not have been the largest ever made, but it was surely the largest ever flown from a kite.

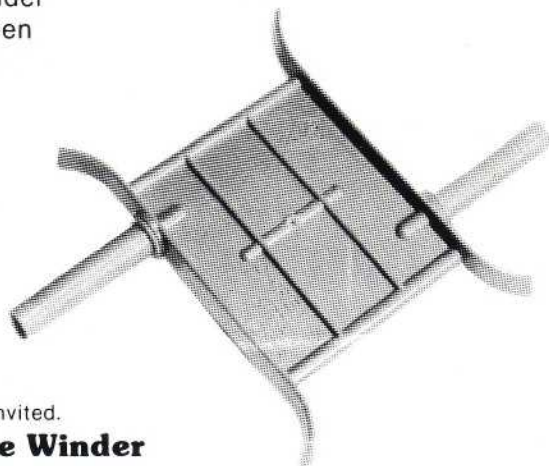
News from Here & There Continues...

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Of our 10 back issues, 8 are still available in original copies and 2 in microfilm. As paper copies become "sold out," it will be our policy to make them immediately available in microfilm at the same price so that the serious kiter need never miss an issue entirely. We suggest you ask for back copies first at your nearest kite store. If they can't fill your order, use the order form on this page to get your copies from us. Here's a brief rundown on contents of our back issues for your convenience and reference.

SPRING 1977 (Vol. 1, No. 1):

Outrigger Kite Plans; Tracing Japan's Customs; Brummitt's Kite Categories; Profile: Paul Garber; Exhibits in New York and Paris; Two Marconi Kite Plans; Use of the Glue Gun; Featherstone-Kite by Rowland Emmett; Heart-Stopping Kite Festivals of Japan, by Tal Streeter; Reviews: kites—Octopus Kites, Corner Kite, Fighters, Better Built and Wright Flyer kit; book—Greger; News from AZ, CA, FL, ME, MD, OH, WA, WI and Japan (1,585 kite train record); Talking about Tails; Ingraham's History of the Magazine; Brown Bag Kite Design.

SUMMER 1977 (Vol. 1, No. 2):

Which Is the Perfect Kite?; Person-Lifting Kites; Trains—The Multikite Phenomenon and Proposed Standards for World Records; Profile: Mike Weletyk; How to Conduct Trains, by John Van Gilder; Tom Van Sant's Trampoline; Reviews: kites—Flare, Firebird and 8 stunters, with Pfund on Dynamics of Controllables; books—Dolan, Lloyd et al and Dickson; Survey of Readers; News from AL, CA, CO, DE, DC, FL, HI, IL, IN, LA, MD, MT, NY, NC, OH, TN, TX, WA, Australia, Canada, Japan and New Zealand; Greger's Dutch Kite.

FALL 1977 (Vol. 1, No. 3):

Gull Delta Drawing; Tail Selection Study; Profile: Ansel Toney; All Saints Day in Guatemala's Hills; Stormy Weathers's Kite Fishing System, Sled Designs and Fishing Story; Kite Fishing in Micronesia; Kite Reels Analyzed (and

12 samples reviewed); News from CA, CT, MD, MA, MI, NJ, NH, NY, NC, OH, TN, TX, WA, Australia, Canada, England, Japan, Malta, Netherlands and New Zealand; Flags, Banners and Kites Exhibition in Seattle; The Sycamore Fire; Ingraham on Temperature Effects on Kites; Greger's Vietnamese Kite; The C.P.S.C. and the Aluminized Dragon: Excerpts from Hearings Transcripts.

WINTER 1977-78 (Vol. 1, No. 4):

Letter with college kite course prospectus; A "New" Medieval Dragon; Thorburn's Stacked Deltas; Reviews: kites—Grandmaster Kite, New Dragons, Spinning Janny; books—"Create a Kite," Thomas, Bloch-Laine et al; Symposium on the Many Facets of the Tetrahedrals: Opinions and Theories (17 expert comments); Comparison Table of Equivalent Kites; Simplified Construction; Trials of the Tetras; Tips for Tets; News from CT, HI, MD, MA, NY, OH, PA, TN, WA, Australia, Canada and Japan; England's Jubilee Year; Ingraham on Shipping Kites; Making Kites with Hundreds of Kids.

SPRING-SUMMER 1978 (Vol. 2, No. 1):

Rogallo Corner Kite Plans; Lincoln Chang's Modified Rokkaku Kites; Profile: J. C. Young's Chinese Kites; Reviews: kites—Flexifoil, Prof. Waldo Box, Wind Mill Kites and Firebird; Feels by Shanti; book—Dwiggins; Death of the Rotoki; Inventor; Aydielt's Rebuttal of Brummitt; Spendlove's Towards a Taxonomy of Kites (poster pull-out); New American Tradition: Kite Festivals! (why, how and the Longevity Factor); Braswell's Figure Kiting; Cerf-Volant Club de France; Announcement, First National AKA Meeting; National Issues and Safety Council; Ingraham on Publishing Problems; Directory of Clubs.

SPRING 1979 (Vol. 2, No. 2):

Reviews: New Roundup of Kite Reels (12 samples reviewed); kites—Covered Wagon kit; books—Tyrrell, Hiroi, Van Gilder's Hand-Hold Reel Design; Kites in Museums—Tokyo and the Smithsonian; Deaths of Shingo Modegi and Frank Motts; Streeter in Paris; Kites in the Wilderness; Record Efforts—altitude, most on a line, indoor duration; Nirvana in Nags Head; Braswell's Two-Stringing the Delta; News from CA, CO, KY, MI, NM, NY, OH, WA, England and Japan; Profile: Stephen Bernstein and his Chinese Bird Kite Plans.

SUMMER 1979 (Vol. 2, No. 3):

Letters disputing altitude record effort; Reviews: kites—Flying Lines, Winged Victory, Cloud Pleasers and Rainbow Stunt Kites; book—Bahadur; Flow Form Kite Plans; Marshall's New Nylon Cutting Technique; AKA Meeting and Grand National Kite Festival in Ocean City, MD; Brummitt: The Sky Is Big Enough for All of Us; News from CA, CT, NY, OR, Canada and England.

FALL 1979 (Vol. 2, No. 4):

Reviews: kites—Craftsmanship from Sri Lanka (6 samples reviewed) and the Soaring Wing; book—Mittin; Symposium on Monumentality in Kites: Is Bigger Better? (23 expert comments); lanuzzi's Critique of Japan's Giants with Weight Comparison Chart and Bedsheet O'dako Plans; Profile: Louise Crowley; Trebilcock's Lighthouse Kite Fishing Method; Record Efforts—kite-boat traction, "junior" record; News from IL, MI, MT, NY, OH, TX, WA, Australia, Canada, England, Ireland, Japan, Malta; Kurler's Super Conyne plans.

WINTER 1979-80 (Vol. 3, No. 1):

Reviews: kites—Rotors (3 samples reviewed) and Bull-Roarer Effect; book—Lloyd-Thomas; Brief Guide to Safe and Sure Kiting; Grauel's Shooting Arrow and Bull's-Eye Target Kites; Profile: George Ham's Parafoils; Death of William Allison; Innovations: Facet Kite by Robinson; Andrew Jones, Ray Merry and the Flexifoil, by Tal Streeter; '79 Events: in Beulah Valley, CO; Kill Devil Hills, NC; Seattle, WA (visited by Shirone, Japan); and Manassas, VA; The Miracle of Sagami-hara, by Carl Poehler; Kites and the Cambodian Spirit.

SPRING-SUMMER 1980 (Vol. 3, No. 2):

Reviews: kites—Skynasaur, Four Winds kites, Soaring Scimitar, Heart's Delight, Spinnaker Diamond; book—Marks; Searching for the Real Will Yolen; David Slays Goliath with Patchwork Special; Variations on a Theme (Tetrahedrals), by Bevan Brown; Kite Aerial Photography—Who's Done It and How: practitioners, history, how-to by Garry Woodcock, Robert S. Price, Stanley Crinklaw, Dale Fleener; Antique Kites, by Robert Ingraham; Record Efforts—largest kite by Shirone Kite Association; How to Bridle a Giant Japanese Kite, by John Van Gilder; News from CA, FL, WI, Australia, England and Japan.

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INTERNATIONAL

News From Here and There

AUSTRALIA

A schedule of regular monthly flies is only part of the story of the Kite Fliers Association of South Australia, Inc. (in the Adelaide area). There are also such major events as the annual championships at Victor Harbor (in sunny November), various workshops and the Christmas barbecue (in sunny December).

At one kite fly, on October 4th, the well-known sculptor/kitemaker from Japan Tsutomu Hiroi was on hand as part of a cultural exchange program run by the Department of Foreign Affairs. Hiroi conducted a kite workshop and participated in the fly.

On September 20, the group attended a Fly Day at the Crippled Children's Association, Regency Park. To quote the

club's president, Ron Carson, from the newsletter of KFA-SA:

"The weather was kind to us with a temperature of around 26°C (78°F) and a gentle breeze. The best part of the afternoon was spent getting sleds, deltas, etc., airborne for the children, and also sorting out crossed kite lines and a few big tangles.

"I think the volunteer helpers from the Association and the members of the KFA-SA had just as much fun as the children themselves.

"As this day was such a success, we have been asked to return at a later date. Maybe we will see some of them at our regular first-Sunday-of-the-month kite flies in the South Parklands."

The Kite Fliers of South Australia fly kites with crippled children in September.



CANADA

A letter from Thomas E. Cows of Portland, OR, (father of Kite Lines Editor Valerie Govig) was full of kite news from a trip to Victoria, British Columbia:

We met just about everybody in Victoria who is interested in kites. Had a nice visit with the owner (Rob Morissey)

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News From Here & There

...Continued from page 52

of the new kite store in Market Square. He says he has the smallest kite store in Canada, and I believe it (only 12' x 12'), but, boy, what a display. He flies kites every day.

Les Varley is quite a character. He makes all of his kites. He will see a picture (i.e., the British Ram in your last issue) and make one himself. He does that all the time with different pictures in the magazine. He never sells a kite but gives them away to the children in Victoria.

Quite a nice guy. He is an ex-jewelry and watch repairman. The Flowing Dutchman is his latest kite and it's something beautiful to behold. He let me fly it, a genuine thrill. The kite is 9 feet high by 5 feet wide and valued at \$900.



Flowing Dutchman.

Thomas E. Cowles

There was very little wind one day so Bernard Stewart and Barry Heibert hooked onto a jeep and drove around Clover Point (the Victoria weekend flying spot) to get their kites airborne. They

fly stacks of Flexifoils there frequently.

I had to promise to bring you and Mel to Victoria the next time you visit here.

FRANCE

Andre Mignard, Secretary of the Cerf-Volant Club de France, sends pictures from the Paris Metro intercommunications hall. From November 3 to 15, 1980, about ten of the club's finest kites were hung from a tree-like display pedestal about



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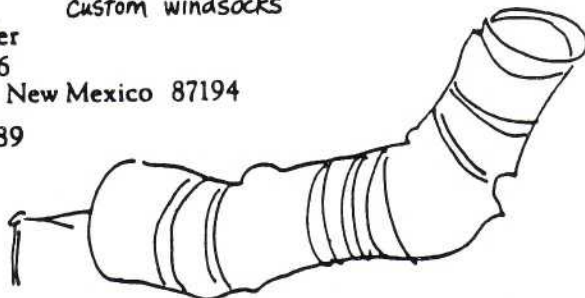
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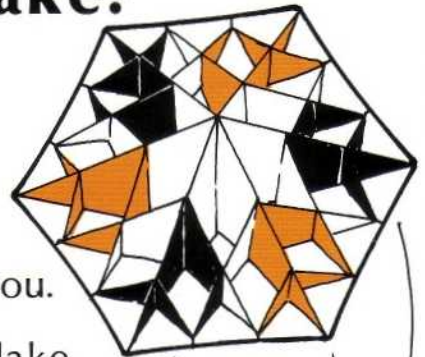
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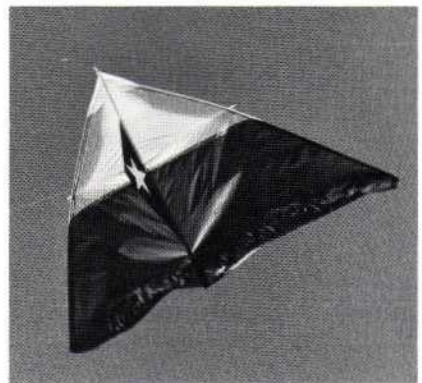


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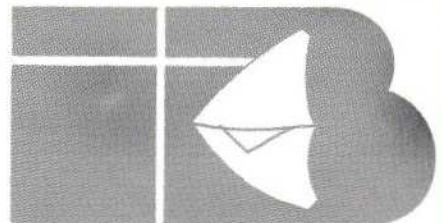
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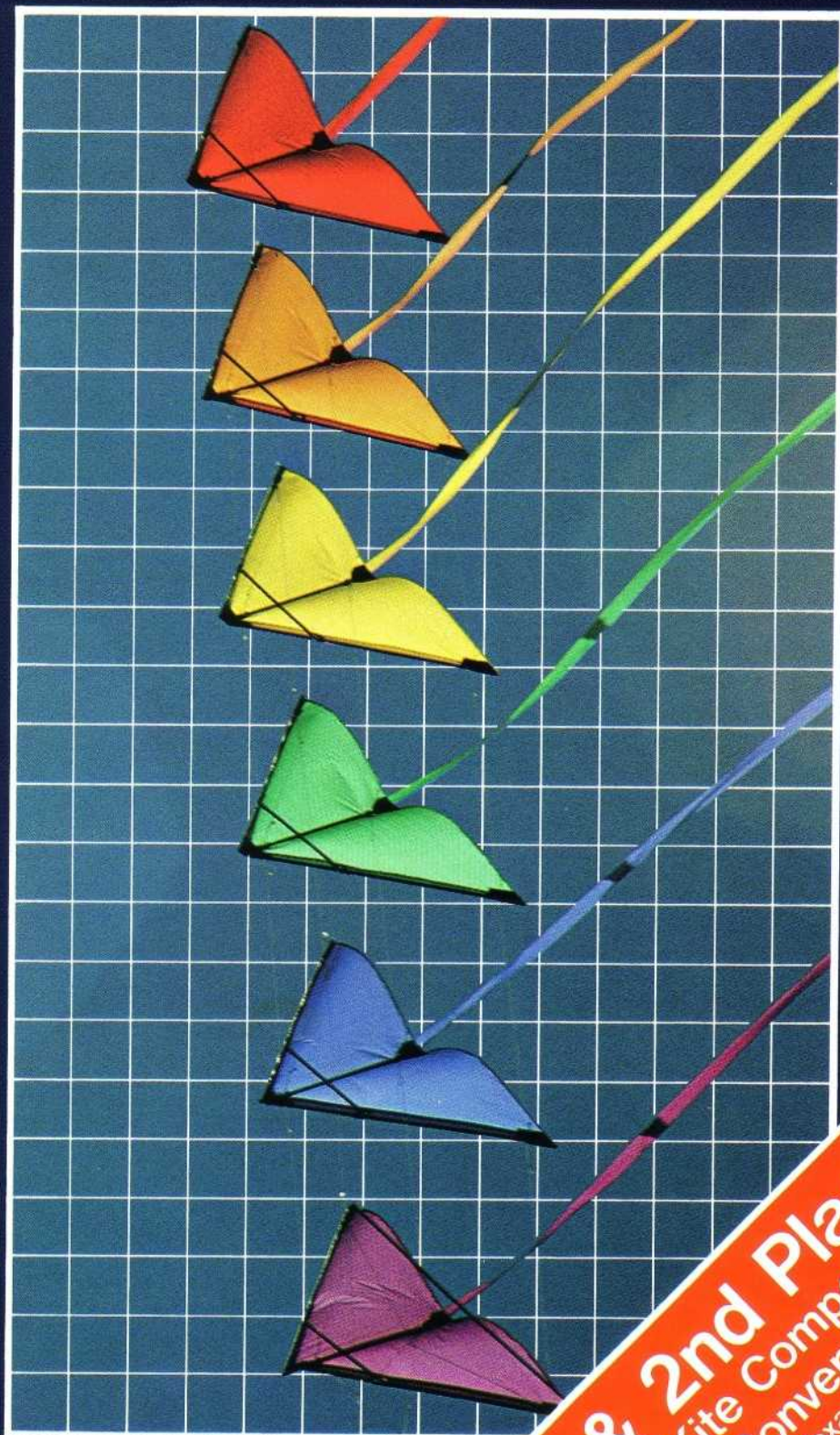
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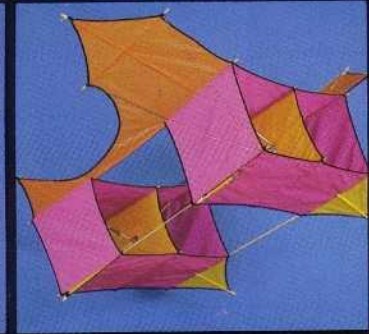
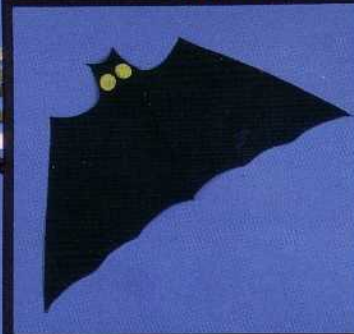
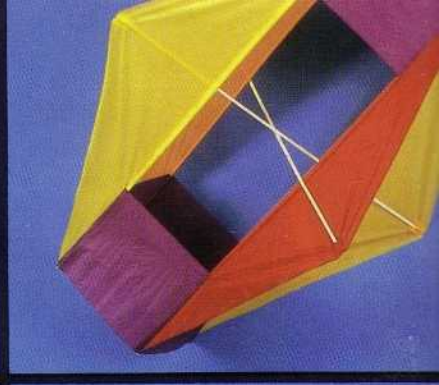
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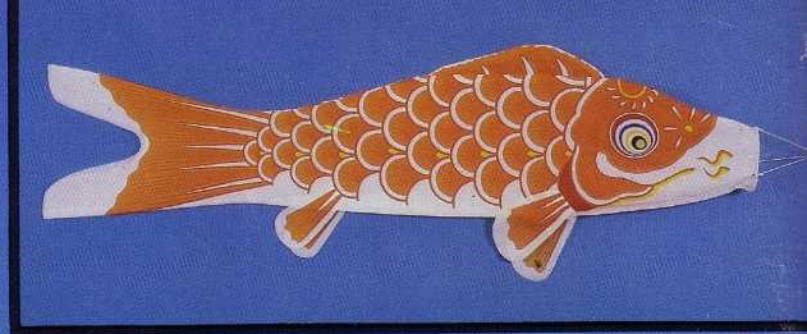
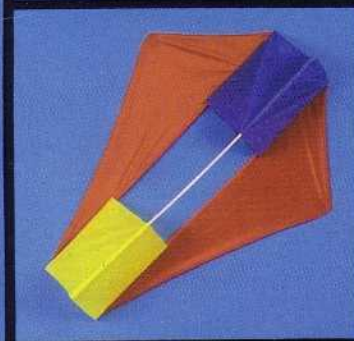
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